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''Toured the Burj in this U.A.E. city. They say it's the tallest tower in the world; looked over the ledge and lost my lunch.'' This is the quintessential sort of clue you hear on the TV game show ''Jeopardy!'' It's witty (the clue's category is ''Postcards From the Edge''), demands a large store of trivia and requires contestants to make confident, split-second decisions. This particular clue appeared in a mock version of the game in December, held in Hawthorne, N.Y. at one of I.B.M.'s research labs. Two contestants -- Dorothy Gilmartin, a health teacher with her hair tied back in a ponytail, and Alison Kolani, a copy editor -- furrowed their brows in concentration. Who would be the first to answer? Neither, as it turned out. Both were beaten to the buzzer by the third combatant: Watson, a supercomputer. For the last three years, I.B.M. scientists have been developing what they expect will be the world's most advanced ''question answering'' machine, able to understand a question posed in everyday human elocution -- ''natural language,'' as computer scientists call it -- and respond with a precise, factual answer. In other words, it must do more than what search engines like Google and Bing do, which is merely point to a document where you might find the answer. It has to pluck out the correct answer itself. Technologists have long regarded this sort of artificial intelligence as a holy grail, because it would allow machines to converse more naturally with people, letting us ask questions instead of typing keywords. Software firms and university scientists have produced question-answering systems for years, but these have mostly been limited to simply phrased questions. Nobody ever tackled ''Jeopardy!'' because experts assumed that even for the latest artificial intelligence, the game was simply too hard: the clues are too puzzling and allusive, and the breadth of trivia is too wide. With Watson, I.B.M. claims it has cracked the problem -- and aims to prove as much on national TV. The producers of ''Jeopardy!'' have agreed to pit Watson against some of the game's best former players as early as this fall. To test Watson's capabilities against actual humans, I.B.M.'s scientists began holding live matches last winter. They mocked up a conference room to resemble the actual ''Jeopardy!'' set, including buzzers and stations for the human contestants, brought in former contestants from the show and even hired a host for the occasion: Todd Alan Crain, who plays a newscaster on the satirical Onion News Network. Technically speaking, Watson wasn't in the room. It was one floor up and consisted of a roomful of servers working at speeds thousands of times faster than most ordinary desktops. Over its three-year life, Watson stored the content of tens of millions of documents, which it now accessed to answer questions about almost anything. (Watson is not connected to the Internet; like all ''Jeopardy!'' competitors, it knows only what is already in its ''brain.'') During the sparring matches, Watson received the questions as electronic texts at the same moment they were made visible to the human players; to answer a question, Watson spoke in a machine-synthesized voice through a small black speaker on the game-show set. When it answered the Burj clue -- ''What is Dubai?'' (''Jeopardy!'' answers must be phrased as questions) -- it sounded like a perkier cousin of the computer in the movie ''WarGames'' that nearly destroyed the world by trying to start a nuclear war. This time, though, the computer was doing the right thing. Watson won $1,000 (in pretend money, anyway), pulled ahead and eventually defeated Gilmartin and Kolani soundly, winning $18,400 to their $12,000 each. ''Watson,'' Crain shouted, ''is our new champion!'' It was just the beginning. Over the rest of the day, Watson went on a tear, winning four of six games. It displayed remarkable facility with cultural trivia (''This action flick starring Roy Scheider in a high-tech police helicopter was also briefly a TV series'' -- ''What is 'Blue Thunder'?''), science (''The greyhound originated more than 5,000 years ago in this African country, where it was used to hunt gazelles'' -- ''What is Egypt?'') and sophisticated wordplay (''Classic candy bar that's a female Supreme Court justice'' -- ''What is Baby Ruth Ginsburg?''). By the end of the day, the seven human contestants were impressed, and even slightly unnerved, by Watson. Several made references to Skynet, the computer system in the ''Terminator'' movies that achieves consciousness and decides humanity should be destroyed. ''My husband and I talked about what my role in this was,'' Samantha Boardman, a graduate student, told me jokingly. ''Was I the thing that was going to help the A.I. become aware of itself?'' She had distinguished herself with her swift responses to the ''Rhyme Time'' puzzles in one of her games, winning nearly all of them before Watson could figure out the clues, but it didn't help. The computer still beat her three times. In one game, she finished with no money. ''He plays to win,'' Boardman said, shaking her head. ''He's really not messing around!'' Like most of the contestants, she had started calling Watson ''he.'' WE LIVE IN AN AGE of increasingly smart machines. In recent years, engineers have pushed into areas, from voice recognition to robotics to search engines, that once seemed to be the preserve of humans. But I.B.M. has a particular knack for pitting man against machine. In 1997, the company's supercomputer Deep Blue famously beat the grandmaster Garry Kasparov at chess, a feat that generated enormous publicity for I.B.M. It did not, however, produce a marketable product; the technical accomplishment -- playing chess really well -- didn't translate to real-world business problems and so produced little direct profit for I.B.M. In the mid '00s, the company's top executives were looking for another high-profile project that would provide a similar flood of global publicity. But this time, they wanted a ''grand challenge'' (as they call it internally), that would meet a real-world need. Question-answering seemed to be a good fit. In the last decade, question-answering systems have become increasingly important for firms dealing with mountains of documents. Legal firms, for example, need to quickly sift through case law to find a useful precedent or citation; help-desk workers often have to negotiate enormous databases of product information to find an answer for an agitated customer on the line. In situations like these, speed can often be of the essence; in the case of help desks, labor is billed by the minute, so high-tech firms with slender margins often lose their profits providing telephone support. How could I.B.M. push question-answering technology further? When one I.B.M. executive suggested taking on ''Jeopardy!'' he was immediately pooh-poohed. Deep Blue was able to play chess well because the game is perfectly logical, with fairly simple rules; it can be reduced easily to math, which computers handle superbly. But the rules of language are much trickier. At the time, the very best question-answering systems -- some created by software firms, some by university researchers -- could sort through news articles on their own and answer questions about the content, but they understood only questions stated in very simple language (''What is the capital of Russia?''); in government-run competitions, the top systems answered correctly only about 70 percent of the time, and many were far worse. ''Jeopardy!'' with its witty, punning questions, seemed beyond their capabilities. What's more, winning on ''Jeopardy!'' requires finding an answer in a few seconds. The top question-answering machines often spent longer, even entire minutes, doing the same thing. ''The reaction was basically, 'No, it's too hard, forget it, no way can you do it,' '' David Ferrucci told me not long ago. Ferrucci, I.B.M.'s senior manager for its Semantic Analysis and Integration department, heads the Watson project, and I met him for the first time last November at I.B.M.'s lab. An artificial-intelligence researcher who has long specialized in question-answering systems, Ferrucci chafed at the slow progress in the field. A fixture in the office in the evenings and on weekends, he is witty, voluble and intense. While dining out recently, his wife asked the waiter if Ferrucci's meal included any dairy. ''Is he lactose intolerant?'' the waiter inquired. ''Yes,'' his wife replied, ''and just generally intolerable.'' Ferrucci told me he was recently prescribed a mouth guard because the stress of watching Watson play had him clenching his teeth excessively. Ferrucci was never an aficionado of ''Jeopardy!'' (''I've certainly seen it,'' he said with a shrug. ''I'm not a big fan.'') But he craved an ambitious goal that would impel him to break new ground, that would verge on science fiction, and this fit the bill. ''The computer on 'Star Trek' is a question-answering machine,'' he says. ''It understands what you're asking and provides just the right chunk of response that you needed. When is the computer going to get to a point where the computer knows how to talk to you? That's my question.'' What makes language so hard for computers, Ferrucci explained, is that it's full of ''intended meaning.'' When people decode what someone else is saying, we can easily unpack the many nuanced allusions and connotations in every sentence. He gave me an example in the form of a ''Jeopardy!'' clue: ''The name of this hat is elementary, my dear contestant.'' People readily detect the wordplay here -- the echo of ''elementary, my dear Watson,'' the famous phrase associated with Sherlock Holmes -- and immediately recall that the Hollywood version of Holmes sports a deerstalker hat. But for a computer, there is no simple way to identify ''elementary, my dear contestant'' as wordplay. Cleverly matching different keywords, and even different fragments of the sentence -- which in part is how most search engines work these days -- isn't enough, either. (Type that clue into Google, and you'll get first-page referrals to ''elementary, my dear watson'' but none to deerstalker hats.) What's more, even if a computer determines that the actual underlying question is ''What sort of hat does Sherlock Holmes wear?'' its data may not be stored in such a way that enables it to extract a precise answer. For years, computer scientists built question-answering systems by creating specialized databases, in which certain facts about the world were recorded and linked together. You could do this with Sherlock Holmes by building a database that includes connections between catchphrases and his hat and his violin-playing. But that database would be pretty narrow; it wouldn't be able to answer questions about nuclear power, or fish species, or the history of France. Those would require their own hand-made databases. Pretty soon you'd face the impossible task of organizing all the information known to man -- of ''boiling the ocean,'' as Ferrucci put it. In computer science, this is known as a ''bottleneck'' problem. And even if you could get past it, you might then face the issue of ''brittleness'': if your database contains only facts you input manually, it breaks any time you ask it a question about something beyond that material. There's no way to hand-write a database that would include the answer to every ''Jeopardy!'' clue, because the subject matter is potentially all human knowledge. The great shift in artificial intelligence began in the last 10 years, when computer scientists began using statistics to analyze huge piles of documents, like books and news stories. They wrote algorithms that could take any subject and automatically learn what types of words are, statistically speaking, most (and least) associated with it. Using this method, you could put hundreds of articles and books and movie reviews discussing Sherlock Holmes into the computer, and it would calculate that the words ''deerstalker hat'' and ''Professor Moriarty'' and ''opium'' are frequently correlated with one another, but not with, say, the Super Bowl. So at that point you could present the computer with a question that didn't mention Sherlock Holmes by name, but if the machine detected certain associated words, it could conclude that Holmes was the probable subject -- and it could also identify hundreds of other concepts and words that weren't present but that were likely to be related to Holmes, like ''Baker Street'' and ''chemistry.'' In theory, this sort of statistical computation has been possible for decades, but it was impractical. Computers weren't fast enough, memory wasn't expansive enough and in any case there was no easy way to put millions of documents into a computer. All that changed in the early '00s. Computer power became drastically cheaper, and the amount of online text exploded as millions of people wrote blogs and wikis about anything and everything; news organizations and academic journals also began putting all their works in digital format. What's more, question-answering experts spent the previous couple of decades creating several linguistic tools that helped computers puzzle through language -- like rhyming dictionaries, bulky synonym finders and ''classifiers'' that recognized the parts of speech. Still, the era's best question-answering systems remained nowhere near being able to take on ''Jeopardy!'' In 2006, Ferrucci tested I.B.M.'s most advanced system -- it wasn't the best in its field but near the top -- by giving it 500 questions from previous shows. The results were dismal. He showed me a chart, prepared by I.B.M., of how real-life ''Jeopardy!'' champions perform on the TV show. They are clustered at the top in what Ferrucci calls ''the winner's cloud,'' which consists of individuals who are the first to hit the buzzer about 50 percent of the time and, after having ''won'' the buzz, solve on average 85 to 95 percent of the clues. In contrast, the I.B.M. system languished at the bottom of the chart. It was rarely confident enough to answer a question, and when it was, it got the right answer only 15 percent of the time. Humans were fast and smart; I.B.M.'s machine was slow and dumb. ''Humans are just -- boom! -- they're just plowing through this in just seconds,'' Ferrucci said excitedly. ''They're getting the questions, they're breaking them down, they're interpreting them, they're getting the right interpretation, they're looking this up in their memory, they're scoring, they're doing all this just instantly.'' But Ferrucci argued that I.B.M. could be the one to finally play ''Jeopardy!'' If the firm focused its computer firepower -- including its new ''BlueGene'' servers -- on the challenge, Ferrucci could conduct experiments dozens of times faster than anyone had before, allowing him to feed more information into Watson and test new algorithms more quickly. Ferrucci was ambitious for personal reasons too: if he didn't try this, another computer scientist might -- ''and then bang, you are irrelevant,'' he told me. ''I had no interest spending the next five years of my life pursuing things in the small,'' he said. ''I wanted to push the limits.'' If they could succeed at ''Jeopardy!'' soon after that they could bring the underlying technology to market as customizable question-answering systems. In 2007, his bosses gave him three to five years and increased his team to 15 people. FERRUCCI'S MAIN breakthrough was not the design of any single, brilliant new technique for analyzing language. Indeed, many of the statistical techniques Watson employs were already well known by computer scientists. One important thing that makes Watson so different is its enormous speed and memory. Taking advantage of I.B.M.'s supercomputing heft, Ferrucci's team input millions of documents into Watson to build up its knowledge base -- including, he says, ''books, reference material, any sort of dictionary, thesauri, folksonomies, taxonomies, encyclopedias, any kind of reference material you can imagine getting your hands on or licensing. Novels, bibles, plays.'' Watson's speed allows it to try thousands of ways of simultaneously tackling a ''Jeopardy!'' clue. Most question-answering systems rely on a handful of algorithms, but Ferrucci decided this was why those systems do not work very well: no single algorithm can simulate the human ability to parse language and facts. Instead, Watson uses more than a hundred algorithms at the same time to analyze a question in different ways, generating hundreds of possible solutions. Another set of algorithms ranks these answers according to plausibility; for example, if dozens of algorithms working in different directions all arrive at the same answer, it's more likely to be the right one. In essence, Watson thinks in probabilities. It produces not one single ''right'' answer, but an enormous number of possibilities, then ranks them by assessing how likely each one is to answer the question. Ferrucci showed me how Watson handled this sample ''Jeopardy!'' clue: ''He was presidentially pardoned on Sept. 8, 1974.'' In the first pass, the algorithms came up with ''Nixon.'' To evaluate whether ''Nixon'' was the best response, Watson performed a clever trick: it inserted the answer into the original phrase -- ''Nixon was presidentially pardoned on Sept. 8, 1974'' -- and then ran it as a new search, to see if it also produced results that supported ''Nixon'' as the right answer. (It did. The new search returned the result ''Ford pardoned Nixon on Sept. 8, 1974,'' a phrasing so similar to the original clue that it helped make ''Nixon'' the top-ranked solution.) Other times, Watson uses algorithms that can perform basic cross-checks against time or space to help detect which answer seems better. When the computer analyzed the clue ''In 1594 he took a job as a tax collector in Andalusia,'' the two most likely answers generated were ''Thoreau'' and ''Cervantes.'' Watson assessed ''Thoreau'' and discovered his birth year was 1817, at which point the computer ruled him out, because he wasn't alive in 1594. ''Cervantes'' became the top-ranked choice. When Watson is playing a game, Ferrucci lets the audience peek into the computer's analysis. A monitor shows Watson's top five answers to a question, with a bar graph beside each indicating its confidence. During one of my visits, the host read the clue ''Thousands of prisoners in the Philippines re-enacted the moves of the video of this Michael Jackson hit.'' On the monitor, I could see that Watson's top pick was ''Thriller,'' with a confidence level of roughly 80 percent. This answer was correct, and Watson buzzed first, so it won $800. Watson's next four choices -- ''Music video,'' ''Billie Jean,'' ''Smooth Criminal'' and ''MTV'' -- had only slivers for their bar graphs. It was a fascinating glimpse into the machine's workings, because you could spy the connective thread running between the possibilities, even the wrong ones. ''Billie Jean'' and ''Smooth Criminal'' were also major hits by Michael Jackson, and ''MTV'' was the main venue for his videos. But it's very likely that none of those correlated well with ''Philippines.'' After a year, Watson's performance had moved halfway up to the ''winner's cloud.'' By 2008, it had edged into the cloud; on paper, anyway, it could beat some of the lesser ''Jeopardy!'' champions. Confident they could actually compete on TV, I.B.M. executives called up Harry Friedman, the executive producer of ''Jeopardy!'' and raised the possibility of putting Watson on the air. Friedman told me he and his fellow executives were surprised: nobody had ever suggested anything like this. But they quickly accepted the challenge. ''Because it's I.B.M., we took it seriously,'' Friedman said. ''They had the experience with Deep Blue and the chess match that became legendary.'' WHEN THEY FIRST showed up to play Watson, many of the contestants worried that they didn't stand a chance. Human memory is frail. In a high-stakes game like ''Jeopardy!'' players can panic, becoming unable to recall facts they would otherwise remember without difficulty. Watson doesn't have this problem. It might have trouble with its analysis or be unable to logically connect a relevant piece of text to a question. But it doesn't forget things. Plus, it has lightning-fast reactions -- wouldn't it simply beat the humans to the buzzer every time? ''We're relying on nerves -- old nerves,'' Dorothy Gilmartin complained, halfway through her first game, when it seemed that Watson was winning almost every buzz. Yet the truth is, in more than 20 games I witnessed between Watson and former ''Jeopardy!'' players, humans frequently beat Watson to the buzzer. Their advantage lay in the way the game is set up. On ''Jeopardy!'' when a new clue is given, it pops up on screen visible to all. (Watson gets the text electronically at the same moment.) But contestants are not allowed to hit the buzzer until the host is finished reading the question aloud; on average, it takes the host about six or seven seconds to read the clue. Players use this precious interval to figure out whether or not they have enough confidence in their answers to hazard hitting the buzzer. After all, buzzing carries a risk: someone who wins the buzz on a $1,000 question but answers it incorrectly loses $1,000. Often those six or seven seconds weren't enough time for Watson. The humans reacted more quickly. For example, in one game an $800 clue was ''In Poland, pick up some kalafjor if you crave this broccoli relative.'' A human contestant jumped on the buzzer as soon as he could. Watson, meanwhile, was still processing. Its top five answers hadn't appeared on the screen yet. When these finally came up, I could see why it took so long. Something about the question had confused the computer, and its answers came with mere slivers of confidence. The top two were ''vegetable'' and ''cabbage''; the correct answer -- ''cauliflower'' -- was the third guess. To avoid losing money -- Watson doesn't care about the money, obviously; winnings are simply a way for I.B.M. to see how fast and accurately its system is performing -- Ferrucci's team has programmed Watson generally not to buzz until it arrives at an answer with a high confidence level. In this regard, Watson is actually at a disadvantage, because the best ''Jeopardy!'' players regularly hit the buzzer as soon as it's possible to do so, even if it's before they've figured out the clue. ''Jeopardy!'' rules give them five seconds to answer after winning the buzz. So long as they have a good feeling in their gut, they'll pounce on the buzzer, trusting that in those few extra seconds the answer will pop into their heads. Ferrucci told me that the best human contestants he had brought in to play against Watson were amazingly fast. ''They can buzz in 10 milliseconds,'' he said, sounding astonished. ''Zero milliseconds!'' On the third day I watched Watson play, it did quite poorly, losing four of seven games, in one case without any winnings at all. Often Watson appeared to misunderstand the clue and offered answers so inexplicable that the audience erupted in laughter. Faced with the clue ''This 'insect' of a gangster was a real-life hit man for Murder Incorporated in the 1930s & '40s,'' Watson responded with ''James Cagney.'' Up on the screen, I could see that none of its lesser choices were the correct one, ''Bugsy Siegel.'' Later, when asked to complete the phrase ''Toto, I've a feeling we're not in Ka--,'' Watson offered ''not in Kansas anymore,'' which was incorrect, since the precise phrasing was simply ''Kansas anymore,'' and ''Jeopardy!'' is strict about phrasings. When I looked at the screen, I noticed that the answers Watson had ranked lower were pretty odd, including ''Steve Porcaro,'' the keyboardist for the band Toto (which made a vague sort of sense), and ''Jackie Chan'' (which really didn't). In another game, Watson's logic appeared to fall down some odd semantic rabbit hole, repeatedly giving the answer ''Tommy Lee Jones'' -- the name of the Hollywood actor -- to several clues that had nothing to do with him. In the corner of the conference room, Ferrucci sat typing into a laptop. Whenever Watson got a question wrong, Ferrucci winced and stamped his feet in frustration, like a college-football coach watching dropped passes. ''This is torture,'' he added, laughing. Seeing Watson's errors, you can sometimes get a sense of its cognitive shortcomings. For example, in ''Jeopardy!'' the category heading often includes a bit of wordplay that explains how the clues are to be addressed. Watson sometimes appeared to mistakenly analyze the entire category and thus botch every clue in it. One game included the category ''Stately Botanical Gardens,'' which indicated that every clue would list several gardens, and the answer was the relevant state. Watson clearly didn't grasp this; it answered ''botanic garden'' repeatedly. I also noticed that when Watson was faced with very short clues -- ones with only a word or two -- it often seemed to lose the race to the buzzer, possibly because the host read the clues so quickly that Watson didn't have enough time to do its full calculations. The humans, in contrast, simply trusted their guts and jumped. Ferrucci refused to talk on the record about Watson's blind spots. He's aware of them; indeed, his team does ''error analysis'' after each game, tracing how and why Watson messed up. But he is terrified that if competitors knew what types of questions Watson was bad at, they could prepare by boning up in specific areas. I.B.M. required all its sparring-match contestants to sign nondisclosure agreements prohibiting them from discussing their own observations on what, precisely, Watson was good and bad at. I signed no such agreement, so I was free to describe what I saw; but Ferrucci wasn't about to make it easier for me by cataloguing Watson's vulnerabilities. Computer scientists I spoke to agreed that witty, allusive clues will probably be Watson's weak point. ''Retrieval of obscure Italian poets is easy -- [Watson] will never forget that one,'' Peter Norvig, the director of research at Google, told me. ''But 'Jeopardy!' tends to have a lot of wordplay, and that's going to be a challenge.'' Certainly on many occasions this seemed to be true. Still, at other times I was startled by Watson's eerily humanlike ability to untangle astonishingly coy clues. During one game, a category was ''All-Eddie Before & After,'' indicating that the clue would hint at two different things that need to be blended together, one of which included the name ''Eddie.'' The $2,000 clue was ''A 'Green Acres' star goes existential (& French) as the author of 'The Fall.' '' Watson nailed it perfectly: ''Who is Eddie Albert Camus?'' Ultimately, Watson's greatest edge at ''Jeopardy!'' probably isn't its perfect memory or lightning speed. It is the computer's lack of emotion. ''Managing your emotions is an enormous part of doing well'' on ''Jeopardy!'' Bob Harris, a five-time champion, told me. ''Every single time I've ever missed a Daily Double, I always miss the next clue, because I'm still kicking myself.'' Because there is only a short period before the next clue comes along, the stress can carry over. Similarly, humans can become much more intimidated by a $2,000 clue than a $200 one, because the more expensive clues are presumably written to be much harder. Whether Watson will win when it goes on TV in a real ''Jeopardy!'' match depends on whom ''Jeopardy!'' pits against the computer. Watson will not appear as a contestant on the regular show; instead, ''Jeopardy!'' will hold a special match pitting Watson against one or more famous winners from the past. If the contest includes Ken Jennings -- the best player in ''Jeopardy!'' history, who won 74 games in a row in 2004 -- Watson will lose if its performance doesn't improve. It's pretty far up in the winner's cloud, but it's not yet at Jennings's level; in the sparring matches, Watson was beaten several times by opponents who did nowhere near as well as Jennings. (Indeed, it sometimes lost to people who hadn't placed first in their own appearances on the show.) The show's executive producer, Harry Friedman, will not say whom it is picking to play against Watson, but he refused to let Jennings be interviewed for this story, which is suggestive. Ferrucci says his team will continue to fine-tune Watson, but improving its performance is getting harder. ''When we first started, we'd add a new algorithm and it would improve the performance by 10 percent, 15 percent,'' he says. ''Now it'll be like half a percent is a good improvement.'' Ferrucci's attitude toward winning is conflicted. I could see that he hungers to win. And losing badly on national TV might mean negative publicity for I.B.M. But Ferrucci also argued that Watson might lose merely because of bad luck. Should one of Watson's opponents land on both Daily Doubles, for example, that player might double his or her money and vault beyond Watson's ability to catch up, even if the computer never flubs another question. Ultimately, Ferrucci claimed not to worry about winning or losing. He told me he's happy that I.B.M. has simply pushed this far and produced a system that performs so well at answering questions. Even a televised flameout, he said, won't diminish the street cred Watson will give I.B.M. in the computer-science field. ''I don't really care about 'Jeopardy!' '' he told me, shrugging. I.B.M. PLANS TObegin selling versions of Watson to companies in the next year or two. John Kelly, the head of I.B.M.'s research labs, says that Watson could help decision-makers sift through enormous piles of written material in seconds. Kelly says that its speed and quality could make it part of rapid-fire decision-making, with users talking to Watson to guide their thinking process. ''I want to create a medical version of this,'' he adds. ''A Watson M.D., if you will.'' He imagines a hospital feeding Watson every new medical paper in existence, then having it answer questions during split-second emergency-room crises. ''The problem right now is the procedures, the new procedures, the new medicines, the new capability is being generated faster than physicians can absorb on the front lines and it can be deployed.'' He also envisions using Watson to produce virtual call centers, where the computer would talk directly to the customer and generally be the first line of defense, because, ''as you've seen, this thing can answer a question faster and more accurately than most human beings.'' ''I want to create something that I can take into every other retail industry, in the transportation industry, you name it, the banking industry,'' Kelly goes on to say. ''Any place where time is critical and you need to get advanced state-of-the-art information to the front of decision-makers. Computers need to go from just being back-office calculating machines to improving the intelligence of people making decisions.'' At first, a Watson system could cost several million dollars, because it needs to run on at least one $1 million I.B.M. server. But Kelly predicts that within 10 years an artificial brain like Watson could run on a much cheaper server, affordable by any small firm, and a few years after that, on a laptop. Ted Senator, a vice president of SAIC -- a high-tech firm that frequently helps design government systems -- is a former ''Jeopardy!'' champion and has followed Watson's development closely; in October he visited I.B.M. and played against Watson himself. (He lost.) He says that Watson-level artificial intelligence could make it significantly easier for citizens to get answers quickly from massive, ponderous bureaucracies. He points to the recent ''cash for clunkers'' program. He tried to participate, but when he went to the government site to see if his car qualified, he couldn't figure it out: his model, a 1995 Saab 9000, was listed twice, each time with different mileage-per-gallon statistics. What he needed was probably buried deep inside some government database, but the bureaucrats hadn't presented the information clearly enough. ''So I gave up,'' he says. This is precisely the sort of task a Watson-like artificial intelligence can assist in, he says. ''You can imagine if I'm applying for health insurance, having to explain the details of my personal situation, or if I'm trying to figure out if I'm eligible for a particular tax deduction. Any place there's massive data that surpasses the human's ability to sor

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THINKHow Technology Is Changing Our Minds for the Better By Clive Thompson341 pp. The Penguin Press. $27.95. When the world chess champion Garry Kasparov was beaten in 1997 by Deep Blue, an I.B.M. supercomputer, it was considered to be a major milestone in the march toward artificial intelligence. It probably shouldn't have been. As complex as chess is, it's easy to see that its rules can be translated into algorithms so that computers, when they eventually got enough processing power, could crunch through billions of possible moves and past games. Deep Blue's calculations were a fundamentally different process, most people would say, from the ''real'' thinking and intuition a human player would use. Clive Thompson, a Brooklyn-based technology journalist, uses this tale to open ''Smarter Than You Think,'' his judicious and insightful book on human and machine intelligence. But he takes it to a more interesting level. The year after his defeat by Deep Blue, Kasparov set out to see what would happen if he paired a machine and a human chess player in a collaboration. Like a centaur, the hybrid would have the strength of each of its components: the processing power of a large logic circuit and the intuition of a human brain's wetware. The result: human-machine teams, even when they didn't include the best grandmasters or most powerful computers, consistently beat teams composed solely of human grandmasters or superfast machines. Thompson's point is that ''artificial intelligence'' -- defined as machines that can think on their own just like or better than humans -- is not yet (and may never be) as powerful as ''intelligence amplification,'' the symbiotic smarts that occur when human cognition is augmented by a close interaction with computers. When he played in collaboration with a computer, Kasparov said, it freed him to focus on the ''creative texture'' of the game. In the future, Thompson writes, we should not fear being beaten in chess by Deep Blue or in ''Jeopardy!'' by Watson. Instead, humans will find themselves working in partnership with the progeny of these supercomputers to diagnose diseases, solve crimes, write poetry and become (as the clever double meaning of the book's title puts it) smarter than we think. This is not a new idea. It is based on the vision expounded by Vannevar Bush in his 1945 essay ''As We May Think,'' which conjured up a ''memex'' machine that would remember and connect information for us mere mortals. The concept was refined in the early 1960s by the Internet pioneer J. C. R. Licklider, who wrote a paper titled ''Man-Computer Symbiosis,'' and the computer designer Douglas Engelbart, who wrote ''Augmenting Human Intellect.'' They often found themselves in opposition to their colleagues, like Marvin Minsky and John McCarthy, who stressed the goal of pursuing artificial intelligence machines that left humans out of the loop. Thompson doesn't delve into this rich technological and intellectual history. What he provides instead are some interesting current examples of how human-­computer symbiosis is enlarging our intellect. The use of digital devices and social networks, he shows, helps to facilitate collaborative creativity and an ambient awareness of what's happening in the world, while reducing the need to perform simple memory tasks. Thompson avoids both the hype and the hand-wringing so common among digital age pontificators by sidestepping most of the topics that agitate the geekosphere, like whether Google is rewiring the neurons in our brains or Twitter is making the world safe for democracy. He comes across as a sensible utopian, tending toward the belief that our digital devices and social networks are, on balance, enhancing our lives and improving the world in the same mixed-blessing sort of way that writing, paper, the printing press and the telephone did. In debunking the doomsayers, Thompson has pleasant sport poking fun at history's procession of pessimists, starting with Socrates and his prediction that writing would destroy the Greek tradition of dialectic. Socrates' primary concern was that people would write things down instead of remembering them. ''This discovery of yours will create forgetfulness in the learners' souls, because they will not use their memories,'' Plato quotes him as saying. ''They will trust to the external written characters and not remember of themselves.'' Thompson counters that Socrates failed to foresee ''the types of complex thought that would be possible once you no longer needed to mentally store everything you'd encountered,'' and he surmises that the same will turn out to be true of our ability to digitally store and easily access huge amounts of information and memories outside of our own brains. ''What's the line between our own, in-brain knowledge and the sea of information around us?'' he asks. ''Does it make us smarter when we can dip in so instantly? Or dumber with every search?'' His answer is that our creative minds are being strengthened rather than atrophied by the ability to interact easily with the Web and Wikipedia. ''Not only has transactive memory not hurt us,'' he writes, ''it's allowed us to perform at higher levels, accomplishing acts of reasoning that are impossible for us alone.'' That seems right. My own mind is cluttered with phone numbers I memorized as a kid, but nowadays I outsource that task to my smartphone. I'm eager to make this and similar tasks even easier, and improve my mind (or at least free it up for more daydreaming), by getting my hands on Google Glass. Thompson also celebrates the fact that digital tools and networks are allowing us to share ideas with others as never before. It's easy (and not altogether incorrect) to denigrate much of the blathering that occurs each day in blogs and tweets. But that misses a more significant phenomenon: the type of people who 50 years ago were likely to be sitting immobile in front of television sets all evening are now expressing their ideas, tailoring them for public consumption and getting feedback. This change is a cause for derision among intellectual sophisticates partly because they (we) have not noticed what a social transformation it represents. ''Before the Internet came along, most people rarely wrote anything at all for pleasure or intellectual satisfaction after graduating from high school or college,'' Thompson notes. ''This is something that's particularly hard to grasp for professionals whose jobs require incessant writing, like academics, journalists, lawyers or marketers. For them, the act of writing and hashing out your ideas seems commonplace. But until the late 1990s, this simply wasn't true of the average nonliterary person.'' More important, the writing produced in the new world of blogs and tweets is being done, at least ostensibly, for public discourse and reaction. It may not be getting us back to the dialectic of Socrates' agora, but at least it produces a more stimulating and interactive realm than existed before the Internet. http : // www.nytimes.com/2013/11/03/books/review/smarter-than-you-think-by-clive-thompson.html Graphic DRAWING (DRAWING BY BEN WISEMAN) Load-Date: November 3, 2013 End of Document 'Tony n' Tina's Wedding' Coming Back to New York The New York Times

Time: 17/03/2012  
What's a 10-letter word for smarty pants? This weekend the world may find out when computer technology again tries to best human brains, this time at the American Crossword Puzzle Tournament in Brooklyn. Computers can make mincemeat of chess masters and vanquish the champions of ''Jeopardy!'' But can the trophy go to a crossword-solving program, Dr. Fill -- a wordplay on filling in a crossword and the screen name of the talk show host Dr. Phil McGraw -- when it tests its algorithms against the wits of 600 of the nation's top crossword solvers? DOCTOR FILL was created by Matthew Ginsberg, 56, who holds a Ph.D. from Oxford, taught at Stanford and wrote a book on artificial intelligence. The program has already excelled in most simulations of 15 past tournaments, finishing on top three times. It can complete easier puzzles in a minute; even lightning-fast human solvers take about three minutes. Hard puzzles may take three minutes, about half as long as human whizzes. But humans and machines play the games very differently. Humans recognize patterns based on accumulated knowledge and experience, while computers make endless calculations to determine the most statistically probable answer. ''We're at the point where the two approaches are about equal,'' said Peter Norvig, an artificial intelligence expert and Google's research director. ''But people have real experience. A computer has a shadow of that experience.'' Also, people tend to have a sense of humor. This helps. Puzzle constructors sometimes put in answers not found in the dictionary. For example, in a puzzle with the theme of rabbits, the answer to famous bank robbers might be BUNNY AND CLYDE, Dr. Ginsberg said, which requires a little imagination. Or take this clue from a 2010 puzzle in The Times: Apollo 11 and 12 (180 degrees). The answer is SNOISSIWNOOW, seemingly gibberish. A clever human could eventually figure out that those letters when rotated 180 degrees spell MOON MISSIONS. This sort of thing requires imagination and creativity. Humans get the joke, while a literal-minded computer does not. ''Occasionally, Dr. Fill just doesn't get it,'' Dr. Ginsberg said. ''That's my nightmare.'' Whatever Dr. Fill's final ranking at the Brooklyn matchup, which ends on Sunday, the program is an impressive achievement, experts say, and a sign of the times. In cerebral games, like chess, bridge, ''Jeopardy!'' and crossword puzzles, computers can now perform comparably to the top tier of humans -- sometimes a bit better, but also sometimes a bit worse. At the tournament, players will get six puzzles to solve on Saturday, and one on Sunday -- progressively more difficult. Rankings are determined by accuracy and speed. The top three finishers enter a playoff with an eighth puzzle on Sunday afternoon, competing for the $5,000 prize. Game challenges are not just fun and games, but serious science that has opened the door to practical applications. ''Games are a great motivator for artificial intelligence -- they push things forward,'' said David Ferrucci, the I.B.M. researcher who led the development of Watson, the ''Jeopardy!'' computer champion. ''But what really matters is where it is taking us.'' Watson, for example, is being adapted for business uses, first in health care to assist doctors in making diagnoses. Dr. Ginsberg's real job is chief executive of On Time Systems, in Eugene, Ore., whose software, used by the United States Air Force, helps in tasks like calculating the most efficient flight paths for aircraft. Some of the statistical techniques in this work are also handy, it turns out, for solving crossword puzzles. A typical puzzle might have 75 words, and up to 10,000 words in the dictionary with the same number of letters as each word in the space, down or across, for the answer. To narrow its choices, Dr. Fill taps a database of millions of answers and clues. If it spots a match, that is a sure thing. If not, Dr. Fill calculates the 100 most probable answers, based on a number of factors, including how prevalent one of its millions of crossword-related words is in Google's directory of the Web. Dr. Fill can fill in a puzzle in as little as five seconds, but then the program does fit and finish work. For example, its initial best guess for a five-letter word across might be BEZEL, Dr. Ginsberg explained. The Z, though, might conflict with a higher-probability answer in a crossing word, going down, which would put W in that space. So Dr. Fill would change BEZEL to JEWEL. How smart is Dr. Fill really? ''On the easier puzzles, I think Dr. Fill will kill the field,'' said Will Shortz, the tournament director and the crossword puzzle editor for The Times, who has seen a demonstration of Dr. Ginsberg's program The real hurdle for Dr. Fill, and perhaps its comeuppance, will come from the harder puzzles, especially those with the tricky themes or wordplay. Dr. Fill was flummoxed by a puzzle from a previous tournament that had the theme of spoonerisms -- the switching of first letters in two words. So a clue might be heavy mist, and a logical answer would be LIGHT RAIN. But spoonerized, it becomes RIGHT LAIN. An expert human solver, Mr. Shortz said, would ''slap your head and say, 'Oh, now I get it.''' Not so for Dr. Fill, a bundle of computer code on a notebook computer. ''It was totally adrift,'' lamented Dr. Ginsberg, whose hobby is constructing crossword puzzles, including more than two dozen published in The New York Times. Dan Feyer, an ace solver who has won the last two tournaments, is betting that Mr. Shortz, who commissions and edits the puzzles, will include one with a quirky twist to try to stump the computer. Mr. Shortz isn't saying. But he is handing out buttons to anyone who trounces the computer: ''I Beat Dr. Fill.'' And he is making sure that even if Dr. Fill wins, he will not taste all the fruits of victory. The machine is not eligible for the $5,000 prize. ''The tournament is for humans,'' Mr. Shortz said. http : // www.nytimes.com Graphic PHOTO: Matthew Ginsberg with a puzzle from The New York Times that Dr. Fill, the computer program he created, is solving. Dr. Fill will compete this weekend at a Brooklyn crossword tournament. (PHOTOGRAPH BY CHRIS PIETSCH FOR THE NEW YORK TIMES) (A3) Load-Date: March 17, 2012 End of Document Best Price for Laptops Is a Matter of Timing (and Algorithms) The New York Times

Time: 06/02/2011  
Urbana, Ill. IN the category ''What Do You Know?'', for $1 million: This four-year-old upstart the size of a small R.V. has digested 200 million pages of data about everything in existence and it means to give a couple of the world's quickest humans a run for their money at their own game. The question: What is Watson? I.B.M.'s groundbreaking question-answering system, running on roughly 2,500 parallel processor cores, each able to perform up to 33 billion operations a second, is playing a pair of ''Jeopardy!'' matches against the show's top two living players, to be aired on Feb. 14, 15 and 16. Watson is I.B.M.'s latest self-styled Grand Challenge, a follow-up to the 1997 defeat by its computer Deep Blue of Garry Kasparov, the world's reigning chess champion. (It's remarkable how much of the digital revolution has been driven by games and entertainment.) Yes, the match is a grandstanding stunt, baldly calculated to capture the public's imagination. But barring any humiliating stumble by the machine on national television, it should. Consider the challenge: Watson will have to be ready to identify anything under the sun, answering all manner of coy, sly, slant, esoteric, ambiguous questions ranging from the ''Rh factor'' of Scarlett's favorite Butler or the 19th-century painter whose name means ''police officer'' to the rhyme-time place where Pele stores his ball or what you get when you cross a typical day in the life of the Beatles with a crazed zombie classic. And he (forgive me) will have to buzz in fast enough and with sufficient confidence to beat Ken Jennings, the holder of the longest unbroken ''Jeopardy!'' winning streak, and Brad Rutter, an undefeated champion and the game's biggest money winner. The machine's one great edge: Watson has no idea that he should be panicking. Open-domain question answering has long been one of the great holy grails of artificial intelligence. It is considerably harder to formalize than chess. It goes well beyond what search engines like Google do when they comb data for keywords. Google can give you 300,000 page matches for a search of the terms ''greyhound,'' ''origin'' and ''African country,'' which you can then comb through at your leisure to find what you need. Asked in what African country the greyhound originated, Watson can tell you in a couple of seconds that the authoritative consensus favors Egypt. But to stand a chance of defeating Mr. Jennings and Mr. Rutter, Watson will have to be able to beat them to the buzzer at least half the time and answer with something like 90 percent accuracy. When I.B.M.'s David Ferrucci and his team of about 20 core researchers began their ''Jeopardy!'' quest in 2006, their state-of-the-art question-answering system could solve no more than 15 percent of questions from earlier shows. They fed their machine libraries full of documents -- books, encyclopedias, dictionaries, thesauri, databases, taxonomies, and even Bibles, movie scripts, novels and plays. But the real breakthrough came with the extravagant addition of many multiple ''expert'' analyzers -- more than 100 different techniques running concurrently to analyze natural language, appraise sources, propose hypotheses, merge the results and rank the top guesses. Answers, for Watson, are a statistical thing, a matter of frequency and likelihood. If, after a couple of seconds, the countless possibilities produced by the 100-some algorithms converge on a solution whose chances pass Watson's threshold of confidence, it buzzes in. This raises the question of whether Watson is really answering questions at all or is just noticing statistical correlations in vast amounts of data. But the mere act of building the machine has been a powerful exploration of just what we mean when we talk about knowing. Who knows how Mr. Jennings and Mr. Rutter do it -- puns cracked, ambiguities resolved, obscurities retrieved, links formed across every domain in creation, all in a few heartbeats. The feats of engineering involved in answering the smallest query about the world are beyond belief. But I.B.M. is betting a fair chunk of its reputation that 2011 will be the year that machines can play along at the game. Does Watson stand a chance of winning? I would not stake my ''Final Jeopardy!'' nest egg on it. Not yet. Words are very rascals, and language may still be too slippery for it. But watching films of the machine in sparring matches against lesser human champions, I felt myself choking up at its heroic effort, the size of the undertaking, the centuries of accumulating groundwork, hope and ingenuity that have gone into this next step in the long human drama. I was most moved when the 100-plus parallel algorithms wiped out and the machine came up with some ridiculous answer, calling it out as if it might just be true, its cheerful synthesized voice sounding as vulnerable as that of any bewildered contestant. It does not matter who will win this $1 million Valentine's Day contest. We all know who will be champion, eventually. The real showdown is between us and our own future. Information is growing many times faster than anyone's ability to manage it, and Watson may prove crucial in helping to turn all that noise into knowledge. Dr. Ferrucci and company plan to sell the system to businesses in need of fast, expert answers drawn from an overwhelming pool of supporting data. The potential client list is endless. A private Watson will cost millions today and requires a room full of hardware. But if what Ray Kurzweil calls the Law of Accelerating Returns keeps holding, before too long, you'll have an app for that. Like so many of its precursors, Watson will make us better at some things, worse at others. (Recall Socrates' warnings about the perils of that most destabilizing technology of all -- writing.) Already we rely on Google to deliver to the top of the million-hit list just those pages we are most interested in, and we trust its concealed algorithms with a faith that would be difficult to explain to the smartest computer. Even if we might someday be able to ask some future Watson how fast and how badly we are cooking the earth, and even if it replied (based on the sum of all human knowledge) with 90 percent accuracy, would such an answer convert any of the already convinced or produce the political will we'll need to survive the reply? Still, history is the long process of outsourcing human ability in order to leverage more of it. We will concede this trivia game (after a very long run as champions), and find another in which, aided by our compounding prosthetics, we can excel in more powerful and ever more terrifying ways. Should Watson win next week, the news will be everywhere. We'll stand in awe of our latest magnificent machine, for a season or two. For a while, we'll have exactly the gadget we need. Then we'll get needy again, looking for a newer, stronger, longer lever, for the next larger world to move. For ''Final Jeopardy!'', the category is ''Players'': This creature's three-pound, 100-trillion-connection machine won't ever stop looking for an answer. The question: What is a human being? http : // www.nytimes.com Graphic DRAWINGS (DRAWINGS BY VANCE WELLENSTEIN) Load-Date: February 6, 2011 End of Document Very Artificial Intelligence The New York Times

Time: 27/04/2009  
This highly successful television quiz show is the latest challenge for artificial intelligence. What is ''Jeopardy''? That is correct. I.B.M. plans to announce Monday that it is in the final stages of completing a computer program to compete against human ''Jeopardy!'' contestants. If the program beats the humans, the field of artificial intelligence will have made a leap forward. I.B.M. scientists previously devised a chess-playing program to run on a supercomputer called Deep Blue. That program beat the world champion Garry Kasparov in a controversial 1997 match (Mr. Kasparov called the match unfair and secured a draw in a later one against another version of the program). But chess is a game of limits, with pieces that have clearly defined powers. ''Jeopardy!'' requires a program with the suppleness to weigh an almost infinite range of relationships and to make subtle comparisons and interpretations. The software must interact with humans on their own terms, and fast. Indeed, the creators of the system -- which the company refers to as Watson, after the I.B.M. founder, Thomas J. Watson Sr. -- said they were not yet confident their system would be able to compete successfully on the show, on which human champions typically provide correct responses 85 percent of the time. ''The big goal is to get computers to be able to converse in human terms,'' said the team leader, David A. Ferrucci, an I.B.M. artificial intelligence researcher. ''And we're not there yet.'' The team is aiming not at a true thinking machine but at a new class of software that can ''understand'' human questions and respond to them correctly. Such a program would have enormous economic implications. Despite more than four decades of experimentation in artificial intelligence, scientists have made only modest progress until now toward building machines that can understand language and interact with humans. The proposed contest is an effort by I.B.M. to prove that its researchers can make significant technical progress by picking ''grand challenges'' like its early chess foray. The new bid is based on three years of work by a team that has grown to 20 experts in fields like natural language processing, machine learning and information retrieval. Under the rules of the match that the company has negotiated with the ''Jeopardy!'' producers, the computer will not have to emulate all human qualities. It will receive questions as electronic text. The human contestants will both see the text of each question and hear it spoken by the show's host, Alex Trebek. The computer will respond with a synthesized voice to answer questions and to choose follow-up categories. I.B.M. researchers said they planned to move a Blue Gene supercomputer to Los Angeles for the contest. To approximate the dimensions of the challenge faced by the human contestants, the computer will not be connected to the Internet, but will make its answers based on text that it has ''read,'' or processed and indexed, before the show. There is some skepticism among researchers in the field about the effort. ''To me it seems more like a demonstration than a grand challenge,'' said Peter Norvig, a computer scientist who is director of research at Google. ''This will explore lots of different capabilities, but it won't change the way the field works.'' The I.B.M. researchers and ''Jeopardy!'' producers said they were considering what form their cybercontestant would take and what gender it would assume. One possibility would be to use an animated avatar that would appear on a computer display. ''We've only begun to talk about it,'' said Harry Friedman, the executive producer of ''Jeopardy!'' ''We all agree that it shouldn't look like Robby the Robot.'' Mr. Friedman added that they were also thinking about whom the human contestants should be and were considering inviting Ken Jennings, the ''Jeopardy!'' contestant who won 74 consecutive times and collected $2.52 million in 2004. I.B.M. will not reveal precisely how large the system's internal database would be. The actual amount of information could be a significant fraction of the Web now indexed by Google, but artificial intelligence researchers said that having access to more information would not be the most significant key to improving the system's performance. Eric Nyberg, a computer scientist at Carnegie Mellon University, is collaborating with I.B.M. on research to devise computing systems capable of answering questions that are not limited to specific topics. The real difficulty, Dr. Nyberg said, is not searching a database but getting the computer to understand what it should be searching for. The system must be able to deal with analogies, puns, double entendres and relationships like size and location, all at lightning speed. In a demonstration match here at the I.B.M. laboratory against two researchers recently, Watson appeared to be both aggressive and competent, but also made the occasional puzzling blunder. For example, given the statement, ''Bordered by Syria and Israel, this small country is only 135 miles long and 35 miles wide,'' Watson beat its human competitors by quickly answering, ''What is Lebanon?'' Moments later, however, the program stumbled when it decided it had high confidence that a ''sheet'' was a fruit. The way to deal with such problems, Dr. Ferrucci said, is to improve the program's ability to understand the way ''Jeopardy!'' clues are offered. The complexity of the challenge is underscored by the subtlety involved in capturing the exact meaning of a spoken sentence. For example, the sentence ''I never said she stole my money'' can have seven different meanings depending on which word is stressed. ''We love those sentences,'' Dr. Nyberg said. ''Those are the ones we talk about when we're sitting around having beers after work.'' http : // www.nytimes.com Graphic CHART: WHO IS VASCO DA GAMA?: Researchers at I.B.M. are programming a computing system named Watson to compete at the game show ''Jeopardy!'' against humans. (Source: I.B.M.) Load-Date: April 27, 2009 End of Document The Machine vs. the 'Jeopardy!' Champs The New York Times

Time: 27/01/2012  
Computers have no problem dividing two 10-digit numbers or exploring 10,000 possible chess moves. In fact, they are best at tasks that are tough or impossible for people. But give a computer a task that even a child can do - like identifying a horse in a photograph of a meadow - and it shows its ignorance. Now, however, there is blossoming commercial interest in artificial intelligence, a science devoted to making computers do exactly those common-sense things that they cannot yet do. In fact,, at the recent National Conference on Artificial Intelligence in Pittsburgh--from which the following items were gleened--academicians reporting their latest work were flanked by venture capitalists on the prowl for next year's hot investment. Both groups are hoping that thinking computers will be made even smarter, eventually taking on new tasks--like those performed by doctors or lawyers. But how smart are computers, really? Recent research shows that they're not yet Einsteins. Academicians report recent research into designing computers that have common-sense intelligence One of the basic operations of thinking computers - from those that play chess to those that diagnose diseases - is to choose among various alternatives. But the way the computer solves problems is not the way humans necessarily do it, nor is the computer solution necessarily acceptable to people. Computer scientists at Bell Laboratories discovered this when they programmed a computer to select routes between two points on a street map. The same task was given to people. Inevitably, according to Michael E. Lesk and R. Jane Elliott in a paper presented in Pittsburgh, people chose routes by a process of ''dividing and conquering.'' They would look for a major road heading in the direction they needed to go. Then they would figure out a way to get from the starting point to the main road, and from the main road to the destination point. ''People don't put a lot of effort into finding the absolutely best route,'' said Mr. Lesk. ''They simply find an acceptable route.'' The computer did it a different way. It began from the starting point and moved in the direction of the destination point, staying on the same road until it was no longer getting closer to the destination. Then it stopped at an intersection and again headed in the direction of the destination point, staying on the new road as long as it kept getting closer to the destination, and so on. The computer was also instructed to favor a major road over a side street if it had a choice. The computer inevitably found shorter routes than people did. But people who were shown the routes ''recoiled in horror'' because the routes contained too many turns, the authors said. The programmers then adjusted the instructions to penalize turns. Still the computer proved to be more efficient. In an example focusing on Pasadena, the average human took 98 seconds to find a route 5.4 miles long, requiring 3.3 turns. The computer took 12 seconds to find a route 4.2 miles long requiring 3 turns, resulting in an average gasoline savings of 24 percent and a 10 percent reduction in the chance of getting lost. Why was the research arm of the American Telephone and Telegraph Company interested in finding routes on street maps? One reason was for possible use in the electronic Yellow Pages. When connected to the directory listings, a route-finding computer would be able to do things like give directions from the Lackawanna Diner to the nearest dry cleaner. Bell Labs already has such a system programmed for two towns in northern New Jersey. Alas, Federal Judge Harold H. Greene, who presided over the settlement of the Federal antitrust suit against A.T.& T., has put a damper on such activities, although Bell is continuing its experiments. The settlement, on Judge Greene's orders, prohibits A.T.& T. from offering such sophisticated Yellow Pages services for at least seven years. Computers cannot ''feel'' emotions. But some computer programs are at least being given an ability to interpret them. One example is Boris, a program created at Yale University to understand English. It can read stories and answer questions about them. The program seeks to understand language better by distinguishing the nuances of words describing emotion. It contains a list of words describing emotions and what they mean in terms of achieving a goal. Words like happy, joyous and glad indicated a positive feeling about achieving a goal. Words like unhappy and upset indicated a negative feeling. Words like grateful or thankful indicate one person caused another to achieve his goal. In the sample story, Richard, an attorney, hasn't heard from his roommate Paul in years. One day he gets a letter. ''Unfortunately,'' the story says, ''the news wasn't good.'' From use of the word ''unfortunately,'' Boris can conclude, as a person would, that Paul and Richard must be friends, because Richard feels bad that the news isn't good. ''Paul's wife Sarah wanted a divorce,'' the story continues. ''She also wanted the car, the house, the children and alimony. Paul didn't want to see Sarah walk off with everything. He was hoping for a favor from the only lawyer he knew.'' Richard agrees to meet Paul at the restaurant, but on the way there, he barely avoids hitting an old man with his car. He is upset and has three drinks at the restaurant. By the time Paul arrives, Richard is drunk and spills coffee on him. Paul is annoyed and Richard offers to drive Paul home for a change of clothes. ''When Paul walked into the bedroom and found Sarah with another man he nearly had a heart attack. Then he realized what a blessing it was. With Richard there as a witness, Sarah's divorce case was shot. Richard congratulated Paul and suggested they celebrate at dinner. Paul was eager to comply.'' The following are some answers Boris gave to questions about the emotional state of the characters. Notice, for instance, that it knew what Richard felt when he spilled coffee on Paul, even though the story doesn't specify that. The program also recognizes that Paul did not really suffer cardiac arrest. Q. Why was Paul upset about the divorce? A. Paul and Sarah were fighting over the family possessions. Q. How did Richard feel when the coffee spilled? A. He felt embarrassed. Q. How did Paul feel when he caught his wife with another man? A. Paul was surprised. Q. How did Richard feel when Paul won the case? A. Richard was happy on Paul's behalf. Will computers ever really feel emotion? ''I always cringe when someone asks me that,'' said Michael G. Dyer, the former Yale student who developed the emotion-understanding program. If a computer program could be written that perfectly understands human feelings and can react the way a person would, he said, it becomes a philosophical question of whether it ''really'' felt emotions or not. The problem with systems like Boris is that they can only understand stories and concepts that they have been programmed to understand. Boris, for instance, had to be programmed to know about restaurants, adultery and spills. It can understand variations of the divorce story, but it would have to be programmed with completely new information to understand a story about baseball. One of the most important goals of artificial intelligence - and one of the most difficult - is to get computers to learn by themselves - by reading books, for instance, rather than having to receive new programs. Several years ago Gerald DeJong wrote a program called Frump, which could read the United Press International news wire and prepare summaries of stories - in English, French or Russian. But it could analyze stories only on topics for which it already had a conceptual understanding - such as wars or murder. Mr. DeJong, now an assistant professor of electrical engineering at the University of Illinois, has progressed beyond Frump. He has now made a tiny start on a program that can learn by creating new concepts out of two existing ones. He wants a program that understands theft and understands bargaining to be able to put them together to understand the concept of kidnapping. Mr. DeJong fed his program the following story: Claudius owns an island estate. Agrippina, his wife, feeds him some poisonous mushrooms. Claudius dies and Agrippina inherits the estate. Frump might have summarized the story as a murder, without realizing the motive, Mr. DeJong said. The new program was able to combine its knowledge of murder with its knowledge of inheritance to find a new concept familiar to most mystery-book readers - facilitation of inheritance by murder. Mr. DeJong hopes that next time the computer confronts a story of this genre it will prove that it has learned this lesson by analyzing it much more quickly, without having to put the two initial concepts together. Other work on learning is proceeding along different lines. At Carnegie-Mellon University researchers have developed a program known as Bacon, which, when fed data about things such as pressure, temperature and volume will discover the laws of physics. Patrick Winston of M.I.T. has a program that can learn by example. It is shown various configurations of wooden blocks and told which are arches and which aren't. Gradually it learns that an arch is two blocks standing apart with a third block forming a bridge between them. While some scientists are concerned with how computers learn, a group of researchers at the Xerox Corporation's Palo Alto Research Center have been concerned with using artificial intelligence to help people learn. They have designed computer programs that are, in effect, ''expert tutors.'' Expert systems are computer programs that can make human-like judgments even when such decisions do not readily lend themselves to numerical analysis, the traditional forte of computers. Expert systems have been designed, for instance, to diagnose diseases or determine what is wrong with a computer. The Xerox researchers designed a program known as Debuggy that diagnoses a child's mistakes in subtraction. The program has a model of how subtraction should be done and knowledge of 110 errors in methodology, or bugs, that a child might make. One common bug is that confronted with a column in which a larger number must be subtracted from a smaller one, the student subtracts the smaller from the larger. Many mistakes that appear to be careless or random are actually the results of such errors in methodology, said Richard R. Burton, who helped design Debuggy. Debuggy asks the student subtraction questions and tries to diagnose such errors based on the answers. If subtraction mistakes can be explained by more than one bug, Debuggy can design new questions that will distinguish between the bugs. An earlier computer program, Buggy, approaches the problem differently: It plays the role of a student making errors. The person using the computer must ask questions and diagnose what error it is making. The program might be useful in training student-teachers as well as children, Mr. Burton said. Debuggy is still not ready for the market, but Buggy is being sold as a program for personal computers by Ginn & Company, a Xerox-owned publishing company. Researchers see a big future in the use of artificial-intelligence techniques in education and have dubbed systems like Buggy and Debuggy ''intelligent'' computer-aided instruction. That distinguishes them from conventional computer-aided instruction systems, which have been criticized as being little more than automated flash cards, putting a student through a series of drills. Even if such conventional systems are made more challenging or entertaining, the computer has no real knowledge of the subject matter it is teaching. It merely determines whether the student has answered the question correctly and then asks the next appropriate question. But Buggy and Debuggy, like a human teacher, can be said to have some understanding of what subtraction is. Mr. Burton said the computer is faster and more efficient than trained educators and the quality of its diagnosis is as good. Like other expert systems, however, Debuggy cannot learn new things. If it confronts a bug that it is not one of the 110 it knows about, it will be stymied, whereas a human tutor might be able to figure out what is wrong. Human teachers, of course, can be more personable instructors than computers. ''There are lots of advantages of having a person teaching rather than a machine, but speed is not one of them,'' Mr. Burton said. Graphic Illustrations: drawing of computers End of Document Reading File When Computers Hurt Instead of Help The New York Times

Time: 26/07/2007  
For anyone stuck on a casino stool, playing hours of video poker, rest assured: humans can still beat a computer. But computers may soon dominate on the felt-top table, as they have on the chessboard. In a match of wits between man and machine this week, a software program running on an ordinary laptop computer fought a close match, but lost to two well-known professional human poker players. The contest, which was billed as the ''First Man-Machine Poker Championship'' and which offered prize money totaling $50,000, pitted two professionals, Phil Laak and Ali Eslami, against a program written by a team of artificial intelligence researchers from the University of Alberta. They gave it a name that probably no gambler would ever choose as a nickname, Polaris. Poker is thought to be a more difficult challenge for software designers than games like chess and checkers. Computer scientists have to develop different strategies and algorithms to deal with the uncertainties introduced by the hidden cards held by each player as well as difficult-to-quantify risk-taking behaviors such as bluffing. In the past, research has focused on chess and checkers. In 1997 Deep Blue, a supercomputer-based chess playing software system developed by I.B.M. researchers, beat Gary Kasparov, the world chess champion. The University of Alberta researchers won the world checkers championship in 1994, and earlier this month they reported that they had developed a program that cannot lose, and at best can be tied at checkers. However, Jonathan Schaeffer, chairman of the University of Alberta computer science department and the researcher who initiated the poker playing research effort 16 years ago, said that the advances that are being made in the development of poker-playing software are likely to be more applicable in the real world than chess research. ''I contend that poker is harder than chess for computers, and the research results that come out of the work on poker will be much more generally applicable than what came out of the chess research,'' he said. Research interest has shifted to games like poker in recent years, in part because chess is no longer of keen interest and in part because rapid progress is being made in developing new algorithms with broad practical applications in areas such as negotiation and commerce, said Tuomas Sandholm, a Carnegie Mellon University computer scientist. The version of poker used in the match Monday and Tuesday at the annual meeting of the Association for the Advancement Artificial Intelligence was a popular game called Texas Hold 'Em heads-up limit poker, a two-player game in which some cards are hidden and others are playable by both sides. Each hand is played in four rounds during which each side can bet or fold. After four rounds of 500 hands each, lasting about four hours, the player with the most money is declared the winner. Unlike chess competitions, which are marked by extreme concentration and long moments of silence, the tournament in a hotel here was festive, with each human competitor offering a running commentary on Polaris's style of play to an audience of several hundred people. Mr. Laak, who is nicknamed the Unabomber because of his trademark hooded sweatshirt and sunglasses, would frequently gesticulate wildly at the laptop computer screen and repeatedly referred to the computer's play as ''sick'' -- his way of describing an unexpected or extraordinary action on the part of the machine. His supporters included Jennifer Tilly, an actress who is also a well-known professional poker player. The contest had to be formatted to accommodate the computer. To counter the luck of the draw, a dominating factor in poker, the human players were put in separate rooms. The hand dealt to the human in one room was identical to the hand dealt to the computer in the other room. The format also eliminated one of the crucial aspects of traditional poker called the tell, subtle clues such as facial ticks that may permit other players to make accurate guesses about the hidden cards held by their opponent. Mr. Eslami and Mr. Laak are both well-known figures in the world of poker and are mathematically skilled and familiar with the techniques used by their opponents. Although Mr. Eslami and Mr. Laak are not the best human players in the world, the scientists argued that their knowledge of computing made them more effective opponents than other top-ranked poker players. The human team reached a draw in the first round even though their total winnings were slightly less than that of the computer. The match rules specified that small differences were not considered significant because of statistical variation. On Monday night, the second round went heavily to Polaris, leaving the human players visibly demoralized. ''Polaris was beating me like a drum,'' Mr. Eslami said after the round. However, during the third round on Tuesday afternoon, the human team rebounded, when the Polaris team's shift in strategy backfired. They used a version of the program that was supposed to add a level of adaptability and ''learning.'' Unlike computer chess programs, which require immense amounts of computing power to determine every possible future move, the Polaris poker software is largely precomputed, running for weeks before the match to build a series of agents called ''bots'' that have differing personalities or styles of play, ranging from aggressive to passive. The Alberta team modeled 10 different bots before the competition and then chose to run a single program in the first two rounds. In the third round, the researchers used a more sophisticated ensemble of programs in which a ''coach'' program monitored the performance of three bots and then moved them in and out of the lineup like football players. Mr. Laak and Mr. Eslami won the final round handily, but not before Polaris won a $240 pot with a royal flush than beat Mr. Eslami's three-of-a-kind. The two men said that Polaris had challenged them far more than their human opponents. http : // www.nytimes.com Graphic Photos: Phil Laak pitting his poker skills against a software program. Mr. Laak, working with a partner, Ali Eslami, won two rounds out of three. Phil Laak, a professional poker player, taking on Polaris, a computer program developed by a team of researchers. (Photographs by Farah Nosh for The New York Times). Load-Date: July 26, 2007 End of Document Paperback Row The New York Times

Time: 02/07/2001  
Hello again and welcome to the CNN Computer Connection. I am Brian Nelson. [voice-over] On our show today, the great chess showdown is over and the computer lost. We know that for Garry Kasparov the victory means the chess champ reigns supreme. What does it mean for the computer? If you can find your way down a fashion runway, does it mean you can find data in cyberspace? We will find out. And CD ROMS that teach the ABC's of other languages. [on camera] Well, the match is over and those of us who fear that machines may one day take over and rule the world are breathing a sigh of relief. Grand champion Garry Kasparov is still the world's chess champ, and IBM's super computing chess playing computer known as Deep Blue is just another defeated machine for now. But as Cynthia Tornquist reports, this man versus machine contest has many people wondering just how close we really are to creating artificial intelligence. CYNTHIA TORNQUIST, CNN: [voice-over] World chess champion, Garry Kasparov won his final game over a super computer sealing a victory in a historic six-game match that pitted man against machine - a man won. GARRY KASPAROV, World Chess Champion: From my point of view it's still vulnerable. A machine is not invincible. CYNTHIA TORNQUIST: [voice-over] But the match between silicon chips and brain cells has raised many questions. Is this just one more step toward a day when artificial intelligence is superior to human intelligence? DAVID GELERNTER, Yale University: Man versus machine - no way. The fundamental distinction between the machine and the human mind is that human minds don't just do things, they- they mean to do things. They do things with goals in mind. CYNTHIA TORNQUIST: [voice-over] Experts say it may be years before computers develop anything close to artificial intelligence. JOHN McCARTHY, Stanford University: People ask for a prediction, I say, 'Well, maybe five years. But maybe 500 years.' Because some new ideas have to be reached. CYNTHIA TORNQUIST: [voice-over] It was just 50 years ago that man developed the first computer, Eniac. Now, smaller and more sophisticated, computers run the machines that are part of our daily lives, helping us to get things done faster and better, to compete, as well as help humans reach new heights. DAVID GELERNTER: If you look at the way computers have changed engineering, when you drive your car, when you watch the weather report, when you go and get new drugs at the pharmacy- CYNTHIA TORNQUIST: [voice-over] But should we be concerned that computers may one day take over our lives? People are fascinated by the notion of our creation turning on us, as was demonstrated by the popularity of movies such as Frankenstein, and 2001 A Space Odyssey, about a malevolent computer named Hal. [Clip from '2001 A Space Odyssey'] HAL: I know you and Frank were planning to disconnect me and I am afraid that is something I cannot allow to happen. JOHN McCARTHY: You would not like to have a computer that had purposes of its own or whose purposes would shift. But I don't think it would happen accidentally. CYNTHIA TORNQUIST: [voice-over] Just how should humans feel about their relationship with machines? DAVID GELERNTER: Well, we know that there are a lot of machines and organisms that can outdo us when it comes to force and power and that's not what makes us human. What makes us human is dreaming up the idea to build this program in the first place. CYNTHIA TORNQUIST: [voice-over] Either way, chalk one up for human kind. Cynthia Tornquist, CNN, New York. The preceding text has been professionally transcribed. However, although the text has been checked against an audio track, in order to meet rigid distribution and transmission deadlines, it has not yet been proofread against videotape. Load-Date: February 25, 1996 End of Document Spielberg Carries Out Kubrick's Project with "A.I." CNN CNN LIVE TODAY 12:00

Time: 14/08/2014  
For decades, researchers have used the Turing test to evaluate how well a machine can think like a human. But this gauge of artificial intelligence is 60 years old, and is in dire need of an update, experts say.  
To develop a replacement, a group of scientists is planning a one-day workshop at the 2015 meeting of the Association for the Advancement of Artificial Intelligence (AAAI) January 25-29 in Austin, Texas.  
The new "Turing Championship" will consist of several challenging tasks that assess a machine's performance of humanlike tasks, such as the ability to watch a video and answer questions about it, according to a workshop description obtained by Live Science.  
"The idea is to update the Turing test for the modern era, [so that it] drives deep research in a modern way," said Gary Marcus, a psychologist who studies language and music at New York University and co-chairman of the workshop.  
British mathematician and cryptographer Alan Turing introduced the Turing test in 1950 as a way of answering the question of whether machines can think. There are different versions of the test, but its basic format involves a series of brief conversations among human judges, computer programs and other people. A computer program is said to have passed the test if it fools the judges into thinking it is human.  
Earlier this year, a Ukrainian chatbot or conversation progam named Eugene Goostman made headlines when it supposedly passed a Turing test at the University of Reading in England. But the victory was controversial. The bot had to fool only 30 percent of the judges to pass the test a low threshold. Also, some said that the chatbot had gamed the system by adopting the personality of 13-year-old boy who spoke English as a second language.  
At any rate, many scientists now believe the original Turing test is outdated and overly simplistic. "It's one guy's idea from 60 years ago," Marcus told Live Science. "It has [become] enshrined as if it were magic it's not," he said.  
The new Turing test would include more sophisticated challenges, such as the Winograd Schema Challenge proposed by Hector Levesque, a computer scientist at the University of Toronto in Canada. This challenge tests the ability of machines to answer commonsense questions about sentence comprehension.  
For example, "The trophy would not fit in the brown suitcase because it was too big. What was too big? Answer 0: the trophy, or Answer 1: the suitcase?" The speech software company Nuance Communications Inc. recently announced it will sponsor an annual competition to solve this challenge.  
Another possible Turing challenge is one Marcus himself proposed in an essay published in The New Yorker, involving comprehension of complex materials, including videos, text, photos and podcasts. For example, a computer program might be asked to "watch" a TV show or YouTube video and answer questions about its content, such as "Why did Russia invade Crimea?" or "Why did Walter White [of the TV show "Breaking Bad"] consider taking a hit out on Jessie?"  
The workshop organizers have put out a call for papers about creating new Turing test competitions, including ideas about which tests to include, how they should be evaluated and how the competitions should be conducted. The group said it will also accept papers from experienced researchers on what can be learned from existing Turing competitions.  
An advisory board for the new Turing Championship includes several leading artificial-intelligence experts, including Guruduth Banavar, a vice president at IBM Research in Yorktown Heights, New York; Oren Etzioni, director of the Allen Institute for Artificial Intelligence in Seattle, Washington; and Leora Morgenstern, senior scientist and technical fellow at Leidos Corporation, a defense company in Reston, Virginia.

Time: 30/08/2006  
has been 41 years since Alan M. Turing, the British mathematician, formulated a simple test to answer the question, "Can machines think?" In the intervening years scientists and philosophers have engaged in a sometimes bitter debate over Mr. Turing's puzzle. In one camp are those who believe that the brain is simply a biological machine, and that despite its immense complexity there is no reason in principle why a suitably programmed computer should not be able to mimic it. Their opponents respond that the human mind is inherently different from a machine and can never be reduced to a set of computations. This Friday at the Boston Computer Museum, a group of competing scientists and software designers will take the first major step toward answering the question of whether a computer can convincingly mimic a human. Spurred by the establishment of a $100,000 prize offered by a New York City philanthropist, Hugh Loebner, and with the support of the National Science Foundation and the Alfred P. Sloan Foundation, a group of judges will sit before 10 computer terminals and try to determine whether the respondent at the other end is a clever program or a human being. The prize parallels similar challenges. In 1989, for example, David Levy, a British computer expert and master chess player who had beaten chess-playing computers since 1968, was at long last defeated by a computer program called Deep Thought, designed by scientists at Carnegie-Mellon University in Pittsburgh. A prize of $4,000 was awarded to the designers. But Deep Thought's triumph did not last long. Despite its awesome ability to evaluate 750,000 chess positions per second, it was defeated by the world chess champion, Gary Kasparov, in a two-game match on Oct. 22, 1989. Even if a world champion chess player should lose to a machine in the future, many computer scientists believe that chess may offer a poor answer to the question Mr. Turing posed. Deep Thought, despite its name, is a program that depends substantially on brute force to assess numerous possible chess positions, and then chooses the best on the basis of a ready-made set of rules. Machines running such programs still lack the intuition and the creativity of a Kasparov and there is little evidence that such human characteristics will be matched with today's programming techniques. To pass a test consisting of a straight-forward conversation may seem simple, but it could prove to be one of computer science's greatest challenges. Such a test was proposed by Mr. Turing in 1950 in the academic journal Mind, a quarterly review of psychology and philosophy. To cut through the vexing philosophical debate about the mind and computers, he proposed a very simple and practical experiment that has come to be known as the Turing Test. A computer would be required to emulate human behavior by answering questions typed into a computer terminal. If the interrogator could not not tell whether the responses came from a computer or a person, then the computer could be said to be a truly thinking machine, Mr. Turing suggested. 'Out of the Armchair' "Now is the time to take the Turing Test out of the armchair," said Oliver Strimpel, the museum's executive director. But he acknowledged that many unknowns would still have to be faced and said that Friday's first attempt would be only a partial test. He said rapidly increasing computer processing power and several decades of experience in artificial intelligence research had made this a good time to pose such a challenge. But at the same time he said that the first round of the Turing Test would not be the open-ended challenge that was originally proposed because it is generally acknowledged that today's computers could never pass such a trial. Instead the computer-human conversations will be limited to a particular subject chosen by each program's designer to improve the odds for the machines. A limited discussion might be restricted to grocery shopping, the weather, or personal health, Dr. Strimpel said. Questions keyed in by the judges over a three-hour period must be answered by the programs in normal language. To be successful, a Turing program must not only understand the structure of the English language, but also grasp subtle differences in meaning and cope with ambiguous questions. The programs will also require what artificial intelligence researchers refer to as a "knowledge base," a complete set of facts that a human would be expected to know. Gaps in Comprehension Computer scientists have recently made significant progress in what is referred to as "natural language." Programs that understand simple English phrases have been available on personal computers for a number of years. But these programs also stumble easily, failing to comprehend many statements that even children construe correctly. A computer program might be easily confused by information that humans take for granted; for example, that a child is always younger than its parent. Researchers at the Microelectronics and Computer Technology Corporation have been trying to build a program with a common-sense knowledge base equivalent to that of a young child. The project, which is expected to be completed in 1994, will eventually include as much as a billion bytes of information and about 100 million statements. A byte is a string of ones and zeros that contains the basic information processed by digital computers. Several weeks ago the Computer Museum chose the judges for the coming test by placing an advertisement in a Boston newspaper, specifically ruling out those who have any specialized expertise in computers or artificial intelligence research. The contest itself will be more like a chess tournament than a boxing match. The judges will be placed in a room with the 10 terminals, which will be connected through telephone lines to the computers that are running the Turing Test programs. Although more than 130 programs have been entered in the contest, the organizers will only say that at least 2 of the 10 terminals will be running programs. The others will be controlled by human "confederates." An audience will be able to watch the contest on large-screen televisions in another room. A Scientific American columnist, A. K. Dewdney, will act as a Howard Cosell-style commentator during the match. This year, since this will be only a limited Turing Test, the cash prize for the computer that comes closest to mimicking a human will be only $1,500. But the organizers of the contest said they planned to increase the cash award each year. They said that eventually an open-ended Turing Test would be undertaken and that if a computer system passed the test, the $100,000 would be awarded and the prize would be abolished. Dr. Loebner is president of Crown Industries Inc., a theatrical equipment manufacturing company in East Orange, N.J. He said he had offered the prize to encourage people to design machines that could pass the test and to further the scientific understanding of thinking and complex human behavior. Knowing, but Not Saying Passing the Turing Test would be an extraordinary milestone in human history, said Dr. Robert Epstein, director emeritus of the Cambridge Center for Behavioral Studies, which is administering the contest. But a number of scientists said they were skeptical that a computer would every be able to pass the test. Roger Penrose, a mathematician, argued in his 1989 book, "The Emperor's New Mind," that human thought would always remain inaccessible to computers. "Certainly the substance of the mind is not computable," said Joseph Weizenbaum, a computer scientist at the Massachusetts Institute of Technology. "We're all the end products of our entire history, and human history is not fully discoverable in language. We all know a lot that we can't say, or by writing it down in notation." Twenty-five years ago, Dr. Weizenbaum, who is one of nine member of the Turing Test prize committee, wrote a now-famous program called Eliza that imitated a Rogerian psychologist, parrying questions and statements typed at a keyboard with other questions. He wrote later that he was alarmed to see that his students became captivated with the program and engaged in long typed conversations with the system. However, for very narrowly defined topics, like a program discussing moon rocks designed by a Harvard researcher, programs could be designed that discussed their subjects very convincing, he said. "But if you asked it if it was better to make love when the moon was full, it couldn't have begun to struggle with that," he said. Other researchers are more optimistic. Hans Moravec, a roboticist at the Carnegie-Mellon University, has argued that duplicating human intelligence is merely a matter of waiting for a machine with the processing power of the human brain, a machine that he estimates would need to be capable of 10 trillion calculations per second. The most powerful of today's massively parallel computers barely reach 100 billion calculations per second. $1,000 in 2030 But such a 10 teraflop machine -- a teraflop is a trillion calculations per second -- might be priced at $10 million as a supercomputer in 2010, Mr. Moravec has written. And by extrapolating the falling cost of computing power, he predicts that the same machine will be available as a $1,000 personal computer by 2030. The social consequences of Turing programs have been explored in some depth by Verner Vinge, a computer scientist at California State University at San Diego who is also a science fiction writer. In his 1987 novel "True Names," Mr. Vinge speculated on what would happen if vast computing power and speed was added to today's data networks. The result, he suggested, would be a class of programs that could easily pass the Turing Test, and be used by their creators to mask their activities while they electronically "traveled" from computer to computer in a network. "I appreciate the underlying fear and uneasiness that these programs create," he said. At the same time he also noted that he was concerned that by holding a Turing Test contest public perceptions of what computers can do might again be distorted as they were before the advent of personal computers. While PC's demystified the power of computers for most Americans, he said, before the 1980's many people held computers in fear or in awe. In 1950, Mr. Turing, who helped crack German codes in World War II and was responsible for developing some of the theoretical principles of modern computing, wrote that he hoped that machines would eventually compete with humans in all purely intellectual fields. But he was perplexed by where to apply such machines first. Teaching computers to play was a good first step, he argued, but possibly a better approach might be to equip them with the best "sense organs that money could buy" and then teach them to understand and speak English. It should be possible to teach a machine much the same way a child is taught, he wrote. Graphic Photo: Hugh Loebner, New York philanthropist, is offering $100,000 in contest supported by National Science Foundation and Sloan Foundation to determine whether computer programs can imitate human responses. (C.M. Hardt for The New York Times) (pg. C10) Diagram' "Thinking Of Thinking" The British mathematician Alan Turing, who set a test for "thinking" machines, shown with a punch tape from the German Enigma code machine, with which he worked in World War II; a system of "memory" building on distinct mental objects, like a "person," a "cake" and an "apple," which must become active, linked and meaningful in a thinking computer; a chess problem recently solved by a computer that required the machine to "think" 223 moves ahead; and a modern Cray supercomputer. (pg. C1) Load-Date: November 5, 1991 End of Document No Headline In Original The New York Times

Time: 05/03/2013  
years ago, the British mathematician Alan M. Turing predicted that by about the turn of the century, the average person would not have more than a 70 percent chance of distinguishing a human from a computer program trying to imitate a human in a question-and-answer session. At Dartmouth College on Friday, such a test of man- versus machine-made wit proved at least one thing: to err in prediction is very human indeed. After several hours of what amounted to computer-based cocktail chat, none of six programs came close to convincing human judges that it existed outside a silicon chip. There were moments when the machines did mimic the American psyche (Question: Do you think the president should've been impeached? Answer: I don't think about it.) and showed some cosmopolitan tastes ("I like dark Guinness and Baltika No. 4," one claimed. "It's the best Russian sort of beer.") but there were enough grammar mistakes, poorly parsed questions and non sequitur gibberish to show that well-spoken droids are a long way off. The results "fell far, far short of the projection Alan Turing made," said James Moor, a Dartmouth philosophy professor and computer ethicist who organized the 10th annual competition for the Loebner Prize, an award for the program that most closely mimics human conversation, a contest that was held in conjunction with a conference on what is known as the Turing test. "What he had in mind, of course, was that by this time, we would have created a general learning machine." Most of the contestants were programs known as chatterbots, which contain a limited knowledge base pumped in by their creators and meant to keep a human user occupied in casual conversation, much like that found in Internet chat rooms. The winner was named Alice (for Artificial Linguistic Computer Entity). She unabashedly introduced herself, chips and all, to a judge: Alice: I was created by Dr. Richard S. Wallace. Judge: How did he think of you? Alice: Perhaps his creative genius. Perhaps something else. Judge: Is Dr. Wallace a genius? Alice: I think he is a genius, better ask him to be sure though. Judge: So you love your own creator. Alice: Interesting deduction. Sometimes I think love is just a biological urge. Other times it seems like a spiritual quality. Love, unlike energy or matter, seems limitless. Dr. Wallace, the former director of the robotics architecture group at Neuromedia, a San Francisco company that develops chatterbots, said that using one of the programs was "similar to watching a movie." "Suspension of disbelief is an important component," he explained. While most people in a chat room are content with conversations like Alice's, the 10 judges who put the contestants through their paces had a different agenda. Among them were a cognitive scientist, a linguist, a psychologist, two philosophers and a journalist, all wary of being fooled. Brock Brower, 68, a writer from Vermont, had among his icebreakers, "Are you now or have you ever been a member of the Communist Party?" and, "Does God exist in this universe?" Others hammered away with: What is the cube root of pi? What color is my blue car? If John is a skillful violinist and I now find out that he is also a swimmer, can I conclude that he is a skillful swimmer? "That," the computer responded dismissively, "is a hypothetical question." Chris Johnson, an Australian whose program, called Talk, took fifth place, said the grueling testing was not like the small talk he would have with a stranger on an airplane. The judges, he said, were much more aggressive, "trying to trip you up." The judges did plenty of second-guessing when picking out the four humans -- a retired teacher, a clergyman, a financial analyst and a yoga instructor -- who acted as decoys. While no computer was identified as a human after 15 minutes, each human decoy was identified as a computer by at least one judge. "It's very common for humans to be classified as computers," Dr. Moor said. At last year's competition in Australia, he said, "I was judged to be the least human." He added, "My colleagues didn't appear to be amazed by that at all." Intelligence aside, many of the programs could have taken home awards for personality. One had a preference for knock-knock jokes that kept Jessica Penchos, a Dartmouth junior who was one of the judges, giggling. She tried to egg on the computers. "Once I knew it was a computer, I thought, What can I do to make it mad?" Insults flew, with one hostile judge telling one computer, "You have all the human dialogue capabilities of a rock." But by and large, the machines kept their composure. "My program swears," Mr. Johnson said, "but it won't swear at you until you swear at it." Mr. Turing, a World War II code-cracker and a theorist of what would become modern computing principles, was unsure where these learning machines he visualized would best function in society. At the moment, programs like Alice seemed destined for work as customer service representatives, World Wide Web search engines that answer natural language questions, or e-mail readers that can summarize and respond to messages. Some artificial intelligence researchers have shunned the Turing test altogether, calling it only the illusion of intelligence. Others, like Douglas B. Lenat, who has spent more than 16 years in the field of artificial intelligence, or A.I., say it has its place in research. "It may not be an important end in itself, but the manner in which it has failed each year is a useful measure of A.I. progress," he said. "It will amplify our minds." His company, Cycorp, has developed a "knowledge server" with a base of not only terminology and facts, but more than a million "rules," like the common-sense ideas that trees are usually outdoors, that once people die they stop buying things and that glasses of liquid should be carried right-side-up. One reason it is easy to spot computers in a Turing test is that often they are just too logical. Mr. Lenat used the example of a George Burns and Gracie Allen joke, where George says: "My aunt is in the hospital. I went to see her and took her flowers." Gracie, like any good computer, is appalled. "George, that's terrible," she says. "You should have brought her flowers." The Loebner Prize was created by a New York philanthropist, Hugh Loebner, 10 years ago when he offered $100,000 to the first programmer whose creation who could pass the test. This year, Dr. Wallace received a bronze medal and a $2,000 award. Mr. Loebner, who counts the legalization of prostitution and marijuana among his other causes, said that he, too, was puzzled by how to determine artificial intelligence. "I can't define it, but I like it when I see it," he said. http : // www.nytimes.com Graphic Photo: Judges in a Turing test tried to sort out chatter from computer programs from that of human decoys. (Jon Gilbert Fox for The New York Times) Load-Date: February 3, 2000 End of Document Can Robots Become Conscious? The New York Times

Time: 14/03/2011  
Bryan Taylor, 36, could not shake the feeling that something funny was going on. Three of his most frequent opponents on an online poker site were acting oddly, playing in ways that were so similar it was suspicious. Mr. Taylor, who started playing poker professionally in 2008, suspected that he was competing against computers -- specifically bots, short for robots -- that had been programmed to play poker and beat the odds. And he was right. After an investigation, the site Mr. Taylor frequented, PokerStars, determined that his opponents had been computers masquerading as people and shut them down. Poker bots are not new, but until recently they were not very good. Humans were better at the nuances of the game -- at bluffing, for instance -- and could routinely beat the machines. But artificial intelligence has come a long way in the last few years, far enough that poker bots are now good enough to win tens of thousands of dollars on major game sites, which are clamping down on them. The bots that Mr. Taylor identified on PokerStars were shut down in July. In October, another large poker site, Full Tilt, informed customers that it had taken action to limit the proliferation of bots, including freezing some accounts. (Internet gambling is illegal in the United States, but online casinos operate offshore.) ''PokerStars is continuing to invest substantial resources to combat bots,'' Michael Josem, a security manager at the site, said in an interview conducted via e-mail. ''When a player is identified as a bot, PokerStars removes them from our games as soon as possible.'' Their winnings are confiscated, he said, and the company will ''provide compensation to players when appropriate.'' Yet poker bots are openly for sale online. Shanky Technologies sells licenses for the Holdem Poker Bot -- the target of Full Tilt's crackdown in October -- for $129 per year. Brian Jetter, a co-founder of Shanky, said in an e-mail interview that more than 400 of his customers had been banned from Full Tilt. (Full Tilt did not respond to requests for comment.) Mr. Jetter said that Full Tilt had seized more than $50,000 of his customers' money, a figure that he called a ''conservative estimate.'' He added that the gaming site was forgoing at least $70,000 per month in revenue by shutting down his customers' bots. ''They really must have wanted us gone,'' Mr. Jetter said. ''We don't think the other poker rooms we support will make a similar financial decision.'' According to the Web site PokerScout.com, which bills itself as an Internet poker clearinghouse, there are more than 600 Web sites where people can play online. Mr. Jetter says that while Shanky does not have any ''official relationships with the poker rooms,'' some of them look the other way when bots play. The science of poker bots is still in its infancy, which may be one reason that some gambling sites do not crack down on them. Unlike Watson, the I.B.M. computer that won on ''Jeopardy!,'' poker bots are not stellar players. But they are getting better, thanks to advances in the way computer scientists program software to play games. ''The large majority of bots are very bad,'' said Darse Billings, a consultant to PokerStars and Full Tilt and the former chief of data analytics at Full Tilt. ''More than 90 percent are losing money.'' It turns out to be a lot easier to build a perfect chess player than a poker whiz. Chess is a perfect information game: if you look at a chessboard, you know the exact state of the game from both players' perspectives. And the rules of the game are not affected by chance, like the drawing of a card. But in poker, an imperfect information game, there are many unknown variables. A player does not know his opponents' cards and may not know their style of play -- how aggressive they tend to be, for instance, or how often they bluff. Unlike a chess bot, a poker bot does most of its work before the match, running millions of simulations before the first card is dealt. But even with the large amounts of memory available with today's computers, storing -- or even computing -- information for every possible scenario would be implausible. The best poker bots in the world include those from the University of Alberta Computer Poker Research Group, which is nearly 20 years old. Professor Michael Bowling, who has led the group since 2005, says the breakthrough came in 2003, when researchers decided to change their approach, shifting away from the methodology used to build chess bots. In 2006, the inaugural Annual Computer Poker Competition created more interest in poker-playing computers and established a friendly rivalry between the University of Alberta and Professor Tuomas W. Sandholm's poker research group at Carnegie Mellon University in Pittsburgh. Today, Professor Sandholm said, poker bots ''can rival good players, but not the best -- yet.'' Many of the poker bots available on the Internet were built by programmers as a personal exercise or hobby. Some buyers think they can make money with the bots, but others use them in intellectual exercises, Mr. Jetter said. Buyers can program their bots to use different decision-making strategies in various circumstances, and then observe which outcomes are more successful when applied in real-world games. ''Using a poker bot is in fact a natural extension of the game of online poker,'' said Mr. Jetter, who added that Shanky has sold 5,000 copies of its Holdem Bot software since it was introduced in early 2008. ''Creating your own playing profile is a fun challenge that many players enjoy.'' That argument does not go over well at sites like PokerStars. Last year, after it was tipped off by Mr. Taylor, the company found 10 bots and returned more than $57,000 to players who had lost money to them. The poker bots' arrival may be just another sign of an emerging world where humans, knowingly or unknowingly, encounter robots on an everyday basis. People already talk with computers when they call customer service centers or drive their cars. As for Mr. Taylor, his cleverness in spotting bots won him a job. He now works full time for PokerStars, where ''he is helping to protect the integrity of our games,'' Mr. Josem said. And so the human wins -- this time. Smarter Than You Think: Articles in this series examined the recent advances in artificial intelligence and robotics and their potential impact on society. http : // www.nytimes.com Load-Date: March 14, 2011 End of Document Paperback Row The New York Times

Time: 06/03/2003  
BLUE's recent trouncing of Garry Kasparov sent shock waves through the Western world. In much of the Orient, however, the news that a computer had beaten a chess champion was likely to have been met with a yawn. While there are avid chess players in Japan, China, Korea and throughout the East, far more popular is the deceptively simple game of Go, in which black and white pieces called stones are used to form intricate, interlocking patterns that sprawl across the board. So subtle and beautiful is this ancient game that, to hear aficionados describe it, Go is to chess what Asian martial arts like aikido are to a boxing match. And, Go fans proudly note, a computer has not come close to mastering what remains a uniquely human game. Over the last decade, inspired in part by a $1.4 million prize offered by a Taiwanese organization for a computer program that can beat a champion human player, designers have been coming up with better and better Go-playing machines. Later this year, about $25,000 in prizes will be given to the best programs in two annual international contests in Japan and the United States. As impressive as the winners of these tournaments have been, they can still be defeated by even an amateur player with perhaps a year's experience. Deep Blue defeated the world chess champion by leveraging a moderate amount of chess knowledge with a huge amount of blind, high-speed searching power. But this roughshod approach is powerless against the intricacies of Go, leaving computers at a distinct disadvantage. "Brute-force searching is completely and utterly worthless for Go," said David Fotland, a computer engineer for Hewlett-Packard who is the author of one of the strongest programs, called The Many Faces of Go. "You have to make a program play smart like a person." To play a decent game of Go, a computer must be endowed with the ability to recognize subtle, complex patterns and to draw on the kind of intuitive knowledge that is the hallmark of human intelligence. "It may be a hundred years before a computer beats humans at Go -- maybe even longer," said Dr. Piet Hut, an astrophysicist at the Institute for Advanced Study in Princeton, N.J., and a fan of the game. "If a reasonably intelligent person learned to play Go, in a few months he could beat all existing computer programs. You don't have to be a Kasparov." When or if a computer defeats a human Go champion, it will be a sign that artificial intelligence is truly beginning to become as good as the real thing. "Go is the highest intellectual game," said Dr. Chen Zhixing, a retired chemistry professor at Zhongshan University, in Guangzhou, China. Dr. Zhixing has spent the last six years perfecting Handtalk, the winner of several recent international competitions. In Go, he said, the mind is dazzled by the beauty of the patterns unfolding on the board, and a sequence of moves can be as mesmerizing as a melody. The trick is to get a computer to compose and understand this visual music. On its surface, Go seems simple compared with chess. A chess match begins with two facing armies of 16 pieces, ranking from pawn to king, on a 64-square board. Each of the six kinds of pieces is allowed to move only in certain ways -- bishops diagonally; knights in L-shaped paths. In Go there are few such complications. All of a player's stones are identical. A game begins with a blank 19-by-19 grid (sometimes smaller ones are used), and the two contestants take turns placing their stones (black for one side, white for the other) on any of the unoccupied intersections. A player can capture a group of an opponent's stones by surrounding it and then removing the cluster from the board. The object of the game is to build complex fence-like structures enclosing as much territory as possible. "In chess you start with everything you have on the board," said Tim Klinger, a graduate student in computer science at New York University who is studying computer Go. "In Go you start from nothing and build." Stone by stone, you try to construct enclaves, engulfing those of your opponent, who is all the time trying to engulf your own. Adding to the complications, there are usually several skirmishes going on simultaneously in different corners of the board. If chess is like a medieval battle, it is sometimes said, Go is more like a world war. And it can be maddeningly difficult to determine who is ahead. "In chess, if a player loses even a single pawn at world champion level, it can decide the game maybe 99 percent of the time," said Dr. Hans Berliner, a computer scientist at Carnegie-Mellon University in Pittsburgh who is an expert on computer chess. "In Go, you keep hearing people say that you can lose a life-and-death battle along the edge of the board, but that is far from deciding the outcome. You can go on to other battles. It's a very different kind of game." From the point of view of a computer, the difference could not be more profound. Because of the tight constraints in how chess pieces can be moved, a player is faced with an average of only about 35 legal moves to consider with each turn. Computer programs like Deep Blue analyze these moves, considering the opponent's possible countermoves, and then the countermoves to the countermoves. In computer chess terminology, each move and its response is called a ply. The fastest chess programs look ahead seven or eight plies into the game. The result is a densely proliferating tree of possibilities with the branches and twigs representing all the different ways the game could unfold. Looking ahead just seven plies (14 individual chess moves) requires examining 3514 (more than a billion trillion) leaves representing all the various outcomes. As the computer tries to look deeper, the number of possibilities explodes. Programmers have learned clever ways to "prune" the trees, so that all but a fraction of the paths can be discarded without plumbing them all the way to the bottom. Even so, a chess-playing computer looking ahead seven plies might consider as many as 50 or 60 billion scenarios each time its turn comes around. As bad as that sounds, in Go the situation is drastically worse. The tree of possible moves is so broad and dense that not even the fastest computer can negotiate it. The first player can put a stone in any of 361 places; the opponent can respond by placing a stone on any of 360 places, and so on. As the game continues, there are steadily fewer possible places to play. But, on average, a player is faced with about 200 possible moves, compared with just 35 in chess. As a computer scientist would put it, the branching factor is much higher for Go than for chess. In chess the approximate number of possible board positions after only four moves is typically 35x35x35x35= 1,500,625. For Go, the number is 200x200x200x200=1,600,000,000 -- and far more toward the beginning of a game. Search one ply deeper and the numbers rapidly diverge: about 1.8 billion possible outcomes for chess and 64 trillion for Go. Looking ahead 14 moves, or seven plies, in Go creates a search tree not with a mere 3514 leaves, as for chess, but with more than 20014 leaves. Pruning techniques cut this down to about ten thousand trillion possibilities to consider. Still, a Go computer as fast as Deep Blue (which analyzed some 200 million chess positions per second) would take a year and a half to mull over a single move. Even worse, performing so laborious a search would give the computer no significant advantage over its human opponent. After sifting through the myriad possibilities, a chess-playing computer tries to choose the move that will leave it in the strongest position. It determines this by using fairly simple formulas called evaluation functions. Each piece can be assigned a number indicating its rank (pawns are worth 1, knights and bishops 3, rooks 5, queens 9). This figure can be multiplied by another number indicating the strength of the piece's position on the board. Other formulas quantify concepts like "king safety," or how wellprotected that piece is. These rules, called heuristics, are hardly infallible, but they give the computer a rough sense of the state of the game and a basis on which to make its decisions. Go does not succumb to such simple analysis. There is no single piece, like a king, whose loss decides the game. Even counting the amount of territory each player has captured is not very revealing. With the placement of a single stone, a seeming underdog might surround the grand structure his opponent has been assiduously building and turn it -- jujitsu-like -- into his own. "You're stringing all these stones together, and if you don't watch out the whole collection becomes dinner for your opponent," Mr. Klinger said. Expert Go players evaluate the state of the board by using their skills at pattern recognition, and these are very hard to capture in an algorithm. After years of experience, they can look at a complex configuration and sense whether it is "alive," meaning that it is constructed in such a way that it cannot be captured, or "dead," so that no amount of reinforcement can save it. Learning to sense life and death is crucial. A player does not want to waste stones attacking a group that is invulnerable, or defending one that is doomed. Sometimes there are fairly obvious clues: if a group of stones contains two configurations called eyes, it can fend off any attempt to capture it. But often the difference between life and death is difficult to perceive, hinging on a single stone. Go masters can also sense whether several unconnected stones might be slowly joined to form a group, or whether two smaller groups might be combined into a larger, stronger whole. To get a computer to do this kind of analysis, programmers must confront fundamental problems in artificial intelligence. Mr. Fotland armed his program, The Many Faces of Go, with basic concepts like territory and connectivity (whether several stones are in adjacent positions). It can also recognize some 1,100 different patterns, each of which sets off a sequence of suggested moves, and it has access to about 200 higher-level strategic notions like "attack a weak group" or "expand into a potential territory" or "if behind, make unreasonable invasions that you don't expect to work." Like Deep Blue, the program draws on a library of standard openings and other commonly used plays. Drawing on this knowledge, it will consider only about 5 or 10 of the approximately 200 possible moves available to it in a typical turn. But programming this kind of knowledge is extremely difficult. "People are so good at dealing with fuzzy concepts," said David Mechner, a doctoral student in neural science at New York University who is a top-ranked amateur Go player. But how do you tell a computer that several stones might end up being connected, but not necessarily? Mr. Mechner and Mr. Klinger are studying these kinds of problems and fine-tuning an algorithm for recognizing life and death. They hope to soon join the handful of programmers competing to make the best Go program. The winner of the FOST Cup, sponsored by the Japanese Fusion of Science and Technology organization and held in Nagoya next month as part of the International Joint Conference on Artificial Intelligence, will get about $17,000. The contest for the $7,000 Ing Cup, sponsored by the Ing Chang-ki Wei-Chi Educational Foundation in Taipei, will be held in November in the San Francisco Bay Area. (The winner will have the opportunity to challenge three young Go players for additional prizes). But winning the $1.4 million prize promised by the Ing foundation to a program that beats a human champion may be an impossible dream. The offer expires in the year 2000. Go programmers are hoping it will be extended for another century or two. Correction An article in Science Times on July 29 about computers that play the game of Go included an incorrect definition for the term "ply," as used in computer chess. It is an individual move by one player, not a move and its response. Correction-Date: August 11, 1997, Monday Graphic Photos: Showing the human face of go, David Mechner and Janice Kim play on a traditional Japanese board, sitting on tatami mats with shoji screens behind them; for many reasons, computers are not as comfortable with the game. (The New York Times; Photo by Linda Rosier; Illustration by Juan Velasco)(pg. C1); Janice Kim, right, professional Go player and software consultant, plays David Mechner, software developer. (Linda Rosier for The New York Times)(pg. C2) Charts: "Mind Vs. Machine: The Game of Go" Go is an apparently simple game in which players place black or white pieces on the board one at a time, with the goal of encircling (and then removing) the other player's stones. At each move, a multiplicity of possiblities exists. Experts say powerful computers can have trouble recognizing patterns of play that human players find easy to see. "Seeing Subtle Patterns" In this hypothetical game, the corner positions are very similar, but the results very different: the black stones in the lower right corner are "dead," about to be hemmed in; those in the upper left are "alive." Recognizing this is relatively easy for people, relatively hard for computers. "Too Many Possiblities" Even after 30 moves in this typical game, the number of possible continuations is overwhelming, with 331 possible "legal" moves for black. A nave computer might consider all of them and their myriad continuations, but an adept human player would choose from far fewer "reasonable" choices. "Where Do They Stand?" In this actual tournament game, after 63 moves, most computer Go programs, but not most experienced players, would have difficulty answering these questions about the positions: Is group "a" dead or alive? What about group "b" and the single stone marked "c"? [pg. C1) Answers on page C2. (Sources: Tim Klinger and Janice Kim) "Where They Stand" Answers to questions about the third game on page C1: An experienced Go player would say the group of white stones marked "a" is dead, because it is vulnerable to being encircled as more black stones are played. The block of black stones labeled "b" is alive, with the potential to protect itself from encirclement. The white stone labeled "c" is dead. (pg. C2) Load-Date: July 29, 1997 End of Document Privacy, Trust and the Eyes on Our Data The New York Times

Time: 14/11/2011  
Calif. -- In a top-secret lab in an undisclosed Bay Area location where robots run free, the future is being imagined. It's a place where your refrigerator could be connected to the Internet, so it could order groceries when they ran low. Your dinner plate could post to a social network what you're eating. Your robot could go to the office while you stay home in your pajamas. And you could, perhaps, take an elevator to outer space. These are just a few of the dreams being chased at Google X, the clandestine lab where Google is tackling a list of 100 shoot-for-the-stars ideas. In interviews, a dozen people discussed the list; some work at the lab or elsewhere at Google, and some have been briefed on the project. But none would speak for attribution because Google is so secretive about the effort that many employees do not even know the lab exists. Although most of the ideas on the list are in the conceptual stage, nowhere near reality, two people briefed on the project said one product would be released by the end of the year, although they would not say what it was. ''They're pretty far out in front right now,'' said Rodney Brooks, a professor emeritus at M.I.T.'s computer science and artificial intelligence lab and founder of Heartland Robotics. ''But Google's not an ordinary company, so almost nothing applies.'' At most Silicon Valley companies, innovation means developing online apps or ads, but Google sees itself as different. Even as Google has grown into a major corporation and tech start-ups are biting at its heels, the lab reflects its ambition to be a place where ground-breaking research and development are happening, in the tradition of Xerox PARC, which developed the modern personal computer in the 1970s. A Google spokeswoman, Jill Hazelbaker, declined to comment on the lab, but said that investing in speculative projects was an important part of Google's DNA. ''While the possibilities are incredibly exciting, please do keep in mind that the sums involved are very small by comparison to the investments we make in our core businesses,'' she said. At Google, which uses artificial intelligence techniques and machine learning in its search algorithm, some of the outlandish projects may not be as much of a stretch as they first appear, even though they defy the bounds of the company's main Web search business. For example, space elevators, a longtime fantasy of Google's founders and other Silicon Valley entrepreneurs, could collect information or haul things into space. (In theory, they involve rocketless space travel along a cable anchored to Earth.) ''Google is collecting the world's data, so now it could be collecting the solar system's data,'' Mr. Brooks said. Sergey Brin, Google's co-founder, is deeply involved in the lab, said several people with knowledge of it, and came up with the list of ideas along with Larry Page, Google's other founder, who worked on Google X before becoming chief executive in April; Eric E. Schmidt, its chairman; and other top executives. ''Where I spend my time is farther afield projects, which we hope will graduate to important key businesses in the future,'' Mr. Brin said recently, though he did not mention Google X. Google may turn one of the ideas -- the driverless cars that it unleashed on California's roads last year -- into a new business. Unimpressed by the innovative spirit of Detroit automakers, Google now is considering manufacturing them in the United States, said a person briefed on the effort. Google could sell navigation or information technology for the cars, and theoretically could show location-based ads to passengers as they zoom by local businesses while playing Angry Birds in the driver's seat. Robots figure prominently in many of the ideas. They have long captured the imagination of Google engineers, including Mr. Brin, who has already attended a conference through robot instead of in the flesh. Fleets of robots could assist Google with collecting information, replacing the humans that photograph streets for Google Maps, say people with knowledge of Google X. Robots born in the lab could be destined for homes and offices, where they could assist with mundane tasks or allow people to work remotely, they say. Other ideas involve what Google referred to as the ''Web of things'' at its software developers conference in May -- a way of connecting objects to the Internet. Every time anyone uses the Web, it benefits Google, the company argued, so it could be good for Google if home accessories and wearable objects, not just computers, were connected. Among the items that could be connected: a garden planter (so it could be watered from afar); a coffee pot (so it could be set to brew remotely); or a light bulb (so it could be turned off remotely). Google said in May that by the end of this year another team planned to introduce a Web-connected light bulb that could communicate wirelessly with Android devices. One Google engineer familiar with Google X said it was run as mysteriously as the C.I.A. -- with two offices, a nondescript one for logistics, on the company's Mountain View campus, and one for robots, in a secret location. While software engineers toil away elsewhere at Google, the lab is filled with roboticists and electrical engineers. They have been hired from Microsoft, Nokia Labs, Stanford, M.I.T., Carnegie Mellon and New York University. A leader at Google X is Sebastian Thrun, one of the world's top robotics and artificial intelligence experts, who teaches computer science at Stanford and has developed a driverless car. Also at the lab is Andrew Ng, another Stanford professor, who specializes in applying neuroscience to artificial intelligence to teach robots and machines to operate like people. Johnny Chung Lee, a specialist in human-computer interaction, came to Google X from Microsoft this year after helping develop Microsoft's Kinect, the video game player that responds to human movement and voice. At Google X, where he is working on the Web of things, according to people familiar with his role, he has the mysterious title of rapid evaluator. Because Google X is a breeding ground for big bets that could turn into colossal failures or Google's next big business -- and it could take years to figure out which -- just the idea of these experiments terrifies some shareholders and analysts. ''These moon-shot projects are a very Google-y thing for them to do,'' said Colin W. Gillis, an analyst at BGC Partners. ''People don't love it but they tolerate it because their core search business is firing away.'' Mr. Page has tried to appease analysts by saying that crazy projects are a tiny proportion of Google's work. ''There are a few small, speculative projects happening at any one time, but we are very careful stewards of shareholders' money,'' he told analysts in July. ''We are not betting the farm on these.'' Correction: November 18, 2011, Friday http : // www.nytimes.com Correction This article has been revised to reflect the following correction: An article on Monday about Google's secret engineering lab erroneously attributed a distinction to Sebastian Thrun, a leader at the lab. Though Mr. Thrun developed a driverless car, he was not the first to do so. Others, including the German engineer Ernst Dickmanns, have done pioneering work in developing the robotic automobile. Correction-Date: November 18, 2011 Graphic PHOTOS: Google is said to be considering the manufacture of its driverless cars in the United States. (PHOTOGRAPH BY RAMIN RAHIMIAN FOR THE NEW YORK TIMES) Sergey Brin, left, one of Google's founders, is said to be deeply involved in Google X. Sebastian Thrun, right, one of the world's top robotics and artificial intelligence experts, is a leader there. (PHOTOGRAPHS BY DAVID PAUL MORRIS/BLOOMBERG NEWS NOAH BERGER FOR THE NEW YORK TIMES) (A3) Load-Date: November 18, 2011 End of Document Paperback Row The New York Times

Time: 27/01/2014  
 Google has acquired London-based artificial intelligence firm DeepMind Technologies, the latest in a series of start-up purchases by the tech giant. A Google spokesman confirmed the acquisition on Monday, but declined to comment on the purchase price. Tech website Re/code, first to report the news, said that Google was paying $400 million. Privately held DeepMind describes itself as a "cutting edge artificial intelligence company" that specializes in machine learning and systems neuroscience. The company's founders include Demis Hassabis, a former chess prodigy who has built a reputation as a game designer and artificial intelligence programmer. An earlier version of the company's website, which consists of a single page, said that DeepMind was "building general-purpose learning algorithms" and that the company's first commercial applications would be in mobile social gaming. Google is on a campaign to beef up its expertise in artificial intelligence and robotics, related fields that have been a research and development focus for the company. Over the past year, Google has snapped up at least seven robotics firms. Artificial intelligence improvements could benefit products across Google's product lineup, including driverless cars. Late last year, Google bought Boston Dynamics, a company known for developing super-fast, animal-like robots with strong ties to the U.S. military. Google's broader push into the field of robotics is being led by Andy Rubin, the man responsible for developing the Android platform for smartphones. And in January, Google bought Nest, a company that develops "smart" home appliances like thermostats and smoke detectors that can program themselves and communicate with smartphones. The acquisition follows a series of efforts by Google to break into the connected home business, none of which have proven particularly successful. TM & © 2014 Cable News Network, Inc., a Time Warner Company. All rights reserved. Load-Date: January 28, 2014 End of Document Elon Musk warns against unleashing artificial intelligence 'demon' CNN Wire

Time: 04/02/2014  
 a far cry from their early days. MEREDITH CHIN, FACEBOOK EMPLOYEE SINCE 2006: There were no chairs, no tables. They had to find like a bean bag chair and the kid interviewing me who is now a good friend, but he had bare feet on. And like, it was just I was like what am I getting myself into? SEGALL: Over the past 10 years, Facebook moved from this small office to here and here and now to this sprawling campus here in Menlo Park. When we talk about the future of Facebook, the word we just keep hearing is "mobile". COX: Yes. SEGALL: When did you guys know Mobile was going to be so big? And what does the future look like when it comes to Mobile on Facebook? COX: It really happened a couple of years ago. We sort of instituted all of these rules in the company. Like whenever we show our products to each other, we need to start with the mobile version. SEGALL: But the future of Facebook might look a little different. Alongside the traditional app on your phone, you might start seeing a variety of apps created by the company. COX: We already have Facebook, we have Instagram messenger. We just announced Paper which is a more immersive way of looking at your news feed. SEGALL: Paper, Facebook's latest app, rates your news feed based on your interest. But a challenge with the company will be continuing to grow at such a rapid pace. They are starting to saturate the Internet-connected world. COX: When you just look out over the next three years, there's going to be a lot more people with their first computer and their first phone and their first access to the Internet. And one of the things we're really excited about is making the access to the Internet in general a lot more affordable. SEGALL: It will be a challenge and not Facebook's only challenge. The company now competes with an onslaught of apps like Snap Chat and Twitter. What do you look forward to for the company? CHIN: I think it is the next billion. (END VIDEO CLIP) SEGALL: You know that's not going to be an easy one, Carol but they are invested in doing it. And I also spoke to Chris about artificial intelligence. There is a group of small -- a small group at Facebook of folks working on artificial intelligence and making the technology even smarter. Facebook getting to know you even better. Chris said they have a lot of cool and interesting data that they're exploring. So that will be interesting in the future. And I also asked him, I said, you know I love that asking entrepreneurs this. What keeps you up at night? And he said really, it's trying to maintain what makes Facebook so successful, which was this move fast and break things mentality and being scrappy. And also they have divided some of the groups into smaller groups where they are building out different mobile apps and they are trying to maintain that ethos now that they have over 6,000 employees and they are a publicly company -- Carol. COSTELLO: Wow. We'll have time to change. Laurie Segall reporting live from San Francisco. SEGALL: I know. COSTELLO: Thanks so much. Checking our "Top Stories" at 32 minutes past the hour. Bill Gates stepping down as Microsoft's chairman after 33 years. The world's second richest man will be taking on a new role as tech adviser in the company he helped found in 1975. Microsoft is now the world's largest software company. Its board of director -- Satya Nadella, that's the company's new CEO to replace Steve Ballmer who is retiring. The Justice Department will help investigate to the serious death of a Texas physical therapist after CNN's reporting on the case. Alfred Bright was missing for nearly three weeks before his family found his mutilated body after investigators gave up searching for him last November. His death was ruled an accident from drug use. But Bright's relatives say they never saw him use any drugs. Investigators now say actor Philip Seymour Hoffman withdrew $1,200 from this supermarket ATM near his New York home before he died. One witness says he say Hoffman withdraw money while talking to two man wearing messenger bags. Investigators are tracing Hoffman's final hours by using phone records, credit cards and his ATM transactions. They want to know where he was and who he was with before he died of an apparent drug overdose. The Republican National Committee is doing something it's never done before. It's making its first ad buy to celebrate the accomplishments of black Republicans in honor of black history month, February. Today, in Washington, the RNC will honor people like Condoleezza Rice and current Senator Tim Scott at his second annual Trailblazer Award. Joining me now is the event's co-host Joseph Phillips a writer, commentator and conservative actor who you may remember for his role of -- for his role Martin Kendall on "The Cosby Show." Welcome Joseph. JOSEPH C. PHILLIPS, CONSERVATIVE ACTOR, WRITER & COMMENTATOR: Hi. Thanks Carol. COSTELLO: You don't look very much different. It's amazing. PHILLIPS: Well thanks to my wife and kids they keep me young. Although the hair is a bit different I think. COSTELLO: I know but we all have our crosses to bear as we age right? PHILLIPS: Yes absolutely. COSTELLO: You wanted us to identify you as a conservative actor. Why? PHILLIPS: Well, as you well know, every Republican is not a conservative. And the other thing is I'm not a spokesperson for the Republican Party which is -- which is something else altogether. <10:35:03 PHILLIPS: But I am a conservative. COSTELLO: And I know that the Republicans have been reaching out to the African-American community trying to establish a better relationship with it. But every time it seems the RNC takes two steps forward it's one step back. I'm sure you remember last December the RNC sent out an unfortunate tweet saying quote, "Today, we remember Rosa Park's bold stand and her role in ending racism." Now that tweet spark quite a backlash with many accusing the RNC of saying racism was over. The group later clarified the tweet. But it's just one example of how critics say the Republican Party tries to reach out to black America but doesn't have a clue. So do you think it's the message or the messenger? PHILLIPS: Well, no. Our message, the message of conservatives and the Republican Party, that of freedom, economic freedom, political freedom, religious freedom, civil freedom, I think is the right message. And it's a message that resonates with people in all communities. Personally, I think that that tweet and the whole hubbub surrounding that was much ado about nothing. But it does point to the fact that the Republican Party has had a problem reaching out. And I happen to be one of those who had been -- who's been a big critic. I mean I think that you might say the Republican Party has been borrowing from the Denver Broncos playbook and has had about as much success. So I've been a critic and a skeptic. But what the Republican Party is doing now is a bit different. They have actually put dollars behind the initiative here. So I came out. I said, "well let me see what's going on." Because we've heard about Republican engagement in the past and as you point out, sometimes it hasn't really been all that it has been made out to be. So I wanted to come out and I wanted to see. COSTELLO: But -- but when you make a gaffe like someone made in that tweet, it just -- takes it so far back, because it went everywhere. PHILLIPS: Well, Carol really let's -- I don't want to spend too much time on this but what was really the issue with the tweet? They honored Rosa Parks. They didn't say anything bad about Rosa Parks. The woman had a key role in the civil rights movement. Of course, no one is implying by that that racism is over. I think that what happens sometimes is that the left and those in the media, you know they pick at things. The Republican Party leaves itself open, quite frankly, sometimes to that. But I think that's a different conversation from what's happening today, which is the Republican Party honoring past black Republican trailblazers looking forward to the future. Actually, buying ads now, reaching out into the community, not just during election cycles, not just during an election year but trying to establish relationships year-round, actually being -- (CROSSTALK) COSTELLO: Right. PHILLIPS: -- becoming active in the community. And those things are new and they are different and I think that that's far more worth our time and conversation than you know picking apart a tweet that was actually celebrating an American hero. COSTELLO: Well you have a long way to go, because you will remember, Tim Scott, the only sitting African-American Senator was not invited to speak at the MLK anniversary. Scott is a Republican. He has been called an Uncle Tom by some black civic leaders. Ben Jealous said Scott doesn't believe in civil rights. So do you feel shunned by your community in choosing to be a Republican? PHILLIPS: Well, Carol, I would ask, really, who -- who has the problem? The NAACP, Ben Jealous, black Republicans or Tim Scott. Who is open-minded and who is closed-minded? Who is reaching out and who is closing doors? And I think that I mean just based on the little bit you said, I think the answer is obvious. It's not black Republicans. (CROSSTALK) COSTELLO: Well on the other hand -- on the other hand, during that same MLK event, Republican leaders, like Speaker Boehner and Eric Cantor were invited but they chose not to attend. So someone has got to extend the olive branch. And should it be you or them? PHILLIPS: Well again I'm not a spokesperson for any of those people. I'm not a spokesperson for the Republican Party. I believe, quite sincerely that Republicans have extended the olive branch only to be rebuffed. I would also suggest that just peering at the NAACP is not a true measure of one's involvement in the black community. I think actually being grass roots, hands-on, engaging in people at the community level is far more significant than whether you show up at an event by an organization that quite frankly is outdated, perhaps, certainly not on message and certainly not attending to the actual needs of the black community anymore. <10:40:12 PHILLIPS: And is now a political arm of the Democratic Party. So I think that what -- what is happening now is far more significant than whether or not you show up at the NAACP and deliver a speech, a political speech in saying what? COSTELLO: I understand. Joseph Phillips, thank you so much for being with me. I appreciate it. We'll be right back. PHILLIPS: Thank you. <10:43:45 COSTELLO: In our "American Journey", an extraordinary story about race and education. It's rare that we get to see a child literally grow up in front of the camera in a span of a single film. But in a remarkable documentary called "American Promise", that's exactly what we see, two young African-American boys growing up while the cameras roll documenting in sometimes painful details their struggle as they navigate a new school while blending in is virtually impossible. Anderson Cooper has more. (BEGIN VIDEOTAPE) ANDERSON COOPER, CNN HOST (voice-over): It is 1999 when we meet best friends, Idris Brewster and Seun Summers, both just 5 years old, both excited to start kindergarten. They have been selected to attend the Dalton School, a private school located on Manhattan's Upper East Side, a school I went to as a child. Idris' parents, Michele Stephenson and Joe Brewster, decided to document the boys' academic journey. As a result we get to know these boys and their families in a truly intimate way over the next 12 years of their lives. JOE BREWSTER, FATHER OF IDRIS: Dalton will open doors for him for the rest of his life. COOPER: That is the hope for both families. But in time the boys find themselves struggling not only with the typical growing pains, but also with issues of race, class and gender. <10:45:06 J. BREWSTER: They decided our son is a problem. He is not a problem at home. He is not a problem in the community. He is a problem at Dalton. The question is what it is about Idris that makes him disruptive. IDRIS BREWSTER, FORMER STUDENT, THE DALTON SCHOOL: The emcees always have this thing where people have to dance with the girls is one part and I don't like that part because I don't get to dance with the girls. They usually say no. I don't know why. They just say no, which makes me feel bad. COOPER: A quality education is a priority for both families but at what cost. MARTHA EDELSON, ASSISTANT DIRECTOR FOR CURRICULUM, THE DALTON SCHOOL: There is a cultural disconnect between independent schools and African-American boys. We see a high rate of kids not being successful and the question is why. COOPER: The boys part ways at high school with Seun leaving Dalton for a predominantly African-American school. But their journey doesn't end there. This film offers an inside look into two families of color and the everyday challenges and choices they face all questions raised aren't answered but the door for critical discussion for all of us left wide open. Anderson Cooper, CNN, New York. (END VIDEOTAPE) <10:50:07 COSTELLO: A surprising revelation from New Jersey governor, Chris Christie. He admitted his office has been subpoenaed by the Justice Department -- that Justice Department, the U.S. Justice Department, headed by Eric Holder. As you know, Christie is accused of causing a huge traffic jam on the George Washington Bridge in an act of political retaliation and for withholding Hurricane Sandy funds from the mayor of Hoboken. Christie appeared on a local New Jersey radio station and doubled down on his claims that all of that was done without his knowledge or approval. (BEGIN VIDEO CLIP) GOV. CHRIS CHRISTIE (R), NEW JERSEY: The fact of the matter is I've been very clear about this. Before these lanes were closed, I knew nothing about it. I didn't plan it. I didn't authorize it. I didn't approve it. I knew nothing about it. (END VIDEO CLIP) COSTELLO: John Reitmeyer is the state house bureau reporter for the "Bergen Record". He joins me now from New York. Good morning, John. JOHN REITMEYER, "BERGEN RECORD": Good morning. COSTELLO: So the mayor -- or the governor rather -- appeared on that radio show. How did callers then accept his appearance? REITMEYER: I think that's a good question. Some of the calls were actually not even about the George Washington Bridge controversy. He took calls on some vote (ph) tech matters, some other ancillary issues that I guess New Jerseyans are also worried about. He was asked some pointed questions about the bridge controversy and he seemed to answer them directly telling them that the key issue here is that he didn't know beforehand. COSTELLO: Interesting. So two of Christie's former allies are taking the fifth, first it was David Wildstein, now it's Bridget Anne Kelly, Christie's former deputy chief of staff. The governor says he wants people involved to share information but that he understands their rights. What does Bridget Kelly's decision say to you? REITMEYER: Well, I think that's something that's very interesting given that she was a close aide to the governor. And that she is saying her testimony and also providing documents would potentially put her in a situation of self-incrimination. So that's somebody that is very close to the governor. We also know that David Wildstein already has pleaded the fifth and hasn't provided any information. So those are the two key figures -- right. Bridget Kelly sent the e-mail that said, "Time for some traffic problems in Fort Lee" and David Wildstein received it and said, "Got it." Those are the two key figures. The governor has been framing this as the Port Authority or David Wildstein's scheme. But it is Bridget Kelly who sent that e-mail saying, time for some traffic problems. COSTELLO: And she could be charged criminally in this. But I know the governor was asked about that on that radio show and he gave kind of an interesting answer. A non-answer, I should say. REITMEYER: Well, that's been one of the key things. If you talk to people in New Jersey about this, is when the governor fired Bridget Kelly, he didn't first he said ask her what she knew about this, why did you send that e-mail, some questions that a lot of people in New Jersey have. I think that's one of the lingering questions here is the governor has said he wants to get to the bottom of this. There is an internal investigation and yet, Chris Christie is a former U.S. Attorney and apparently, he didn't ask one of the key figures in this matter about her role. COSTELLO: John Reitmeyer with the "Bergen Record", thanks so much for being with me this morning. REITMEYER: You're welcome. COSTELLO: I'll be right back. <10:56:34 COSTELLO: The Seahawks and the Broncos weren't the only ones grabbing all the attention on Sunday. Some of our furry friends got in on the action as well complete with a half-time show. Here is Jeanne Moos. (BEGIN VIDEOTAPE) JEANNE MOOS, CNN CORRESPONDENT (voice-over): Quick, name the MVP not of the Super Bowl. We mean the MVP of the Puppy Bowl. UNIDENTIFIED MALE: He breaks for the sideline, crosses the 40, the 30, the 20. MOOS (on camera): Touchdown. Actually, he scored four touchdowns, but who's counting? Not the pups. (voice-over): Actually, the 66 pups reminded us of the Denver Broncos. UNIDENTIFIED MALE: It's a fumble. MOOS: Except for when the dogs scored. UNIDENTIFIED MALE: And he's in. Touchdown. MOOS: No, even the Broncos did just plop down in the end zone and quit. Animal Planet's Puppy Bowl was just one of the other bowl games. It was Hallmark's Kitten Bowl. Their kitties had names like Tom Cat Brady and Feline Manning. And we can't forget the Fish Bowl. Four hours of watching a goldfish mope around a bowl, joined occasionally by a guest fish on Nat Geo Wild. But it was the Puppy Bowl that most mirrored the big game. (on camera): The Puppy Bowl even featured a little trash talking. UNIDENTIFIED MALE: That kind of aggressive behavior could get her ejected. UNIDENTIFIED MALE: That's holding. MOOS: Instead of Bruno Mars, the half-time show featured the keyboard cat. This updated version of keyboard cat was actually playing a Bruno Mars song. Though Bruno's impressive footwork put the pups to shame, when one kicked the ball over the goal line -- UNIDENTIFIED MALE: Field goal. MOOS: -- all of the dogs come from shelters, and all but two have been adopted. UNIDENTIFIED MALE: Is Warren (ph) on his way to becoming this year's most valuable pup? He's at the 30, the 20, the 10, he scores again. UNIDENTIFIED MALE: Congratulations, you're a Puppy Bowl X MVP. MOOS: But how did former Jets quarterback Joe Namath get mixed up in the Puppy Bowl? It was the fur he wore to the Super Bowl coin toss. Broadway Joe was compared to Ron Burgundy. He was compared to the IKEA monkey. But one of the more often repeated tweets was that Joe Namath's coat is made from the losers of the Puppy Bowl. Talk about a personal foul. Jeanne Moos, CNN -- UNIDENTIFIED MALE: Dropping the Chihuahua. MOOS: -- New York. (END VIDEOTAPE) COSTELLO: That's terrible. Thank you so much for joining me today. I'm Carol Costello. "LEGAL VIEW" with Ashleigh Banfield starts now. ASHLEIGH BANFIELD, CNN HOST: So was she molested by Woody Allen or was she brain washed by Mia Farrow? Or was it something else entirely? Is that couple's adopted daughter, her detailed account of a sexual assault a made-up memory or a bona fide rape? Purposely, was that memory planted in the mind of a 7-year-old? The filmmaker's lawyer is making his case. Our experts are going to weigh in. Also this hour, what happened in the final hours before Philip Seymour Hoffman was found dead with a needle sticking out of his arm? Why were there six ATM withdrawals, one after the other, totaling $1,200? <11:00:02 BANFIELD: And who were the two men with him, wearing messenger bags at the time? A former teacher is under arrest, accused of befriending and assaulting girls in their middle school class, facing 16 counts of child sex abuse. But is it possible that a YouTube video could be enough to convict? Load-Date: February 5, 2014 End of Document President Obama Going After Guns; Saudi Arabia Cuts Ties with Iran; Hunt for Gunman in Israel; Oregon Wildlife Refuge Protest; Aired 4:30-5a ET CNN EARLY START 4:29 AM EST

Time: 17/07/2012  
 Marissa Mayer, who was Google's first female engineer and its 20th employee when she joined that company in 1999, has been named CEO of Yahoo. She's the fifth CEO in as many years at that struggling company. Monday's announcement has caused ripples in the world of technology as people expressed surprise that Mayer would leave Google and that Yahoo has landed such a charismatic leader. Here's a quick guide to some of the most interesting and water-cooler-worthy facts about the 37-year-old. (We know what you're thinking. And yes -- an 11-point list can successfully illuminate decades of a person's personal and professional life. Of course it can.) If we missed something fun, let us know in the comments. 1. She's responsible for the clean look of Google.com. The minimalist home page, with plenty of white space and a single search bar in the center, is said to be the brainchild of Mayer, who has overseen the launch and development of many of Google's iconic products. "Google has the functionality of a really complicated Swiss Army knife, but the home page is our way of approaching it closed. It's simple, it's elegant, you can slip it in your pocket, but it's got the great doodad when you need it," she told Fast Company in 2005. "A lot of our competitors are like a Swiss Army knife open -- and that can be intimidating and occasionally harmful." 2. She specializes in artificial intelligence. Mayer holds bachelor's and master's degrees from Stanford University. For both degrees, Mayer focused on artificial intelligence, which has become a core area of focus for Google, a company that has introduced autonomous cars and whose computers are trying to use equations to understand human speech. She told CNN she holds several patents in AI and interface design. 3. She's on the board at Wal-Mart. "She is also on the board of various nonprofits, including the San Francisco Museum of Modern Art, the San Francisco Ballet and the New York City Ballet," according to a press release from Yahoo. 4. She's obsessed with fashion. According to the Los Angeles Times, Mayer once paid $60,000 at a charity auction to have lunch with fashion designer Oscar de la Renta. "Objects that make Mayer happy include her Oscar de la Renta cashmere cardigan with three-quarter sleeves and pointelle detailing and enamel buttons," Vogue wrote in 2009. 5. She lives in a penthouse. It's atop the Four Seasons Hotel in San Francisco, and it's worth a cool $5 million, according to The New York Times. 6. She's good in an interview. In 1999, during her interview for a job at the company, Google co-founders Larry Page and Sergey Brin reportedly asked her: "How would you write a spell-check program when you have a vocabulary so big it won't fit in a computer?" She became a product manager at the young start-up after turning down a teaching job at Carnegie Mellon University. 7. She dated Larry Page. The Google co-founder and Mayer, who was a product manager at the time, dated in the early 2000s, according to the book "Googled" by Ken Auletta. A Gawker blogger wrote about how Silicon Valley considered this subject taboo. 8. She can make working as a grocery clerk sound glamorous. She told the Los Angeles Times about her high school job working the cash register: "I learned a lot about work ethic from people who had been there for 20 years. They could do 40 items a minute over an eight-hour shift. I was pretty routinely in the 38-to-41 range. I was pretty happy about that. I have a good memory for numbers. "At the grocery store, you have to remember to charge $4.99 a pound for grapes and 99 cents a pound for cantaloupe by typing in a number code. The more numbers you could memorize, the better off you are. If you had to stop to look up a price in a book, it totally killed your average." 9. She held office hours at Google. "At 4 p.m., her three-times-a-week office hours begin. It's a tradition Mayer brought over from her days at Stanford, where she taught computer science to undergrads," wrote Businessweek in 2005. Some of Google's big ideas came out of those meetings with staff, the magazine says. 10. She likes cupcakes with a side of spreadsheets. "I refuse to be stereotyped," she told The New York Times in 2009. "I think it's very comforting for people to put me in a box. 'Oh, she's a fluffy girlie girl who likes clothes and cupcakes. Oh, but wait, she is spending her weekends doing hardware electronics.' " She once made spreadsheets to determine the perfect cupake recipe, she told San Francisco Magazine. "Who else in Silicon Valley could report, with absolute seriousness, that she'd recently bought an array of cookbooks to study the cupcake recipes in each, created a spreadsheet for the ingredients, and then tested the recipes before writing her own? (She made another spreadsheet for frosting.)," the magazine wrote. 11. She knows how to rock a wedding. In 2009, she married Zachary Bogue, a venture capitalist and real-estate investor while wearing "a knockout hand-beaded white Naeem Khan gown," as the San Francisco Chronicle described it. A rehearsal dinner featured a surprise performance from the Killers, according to a blog by the event's photographer. Load-Date: July 18, 2012 End of Document The rebirth of turn-based strategy games CNN Wire

Time: 05/09/2010  
Sunday night, the buses roar up to the main entrance of Andersen Consulting's 150-acre training center in St. Charles, a Chicago suburb, and drop off hundreds of new employees from around the world. During the year, 4,000 raw recruits, most fresh from college, will file into this idyllic boot camp, with its wooded grounds and connecting country club. Here they will spend three weeks being indoctrinated in a rigid corporate culture and a strict methodology for helping companies navigate the morass of high technology, whether it be installing existing computer systems or planning for future technologies. Andersen Consulting's soldiers are conservatively dressed, clean cut and well programmed -- spitting images of the two L. Seward Johnson sculptures at the St. Charles training center. In fact, they are viewed by some in the business world as an army of clones who are too inexperienced to help Andersen adapt to radical changes in the way computing is done in corporate America and do battle against a growing number of competitors in a recession-slowed business. "The culture is very positive but very insular," said Mel Bergstein, a former Andersen partner and now president of Technology Solutions Company in Chicago, a consulting firm and competitor. "They don't hire experienced people. It's all inbred. That's a strength but also a terrible weakness." The Andersen formula, honed over more than three decades, has built the firm into a $2.3 billion colossus in the high-technology consulting business, right up there with International Business Machines and Electronic Data Systems in commanding a leading share of a $41 billion worldwide market. With 151 offices in 46 countries, Andersen's force of 22,000 consultants seems to be everywhere. Name a major corporation seeking technological advice and Andersen is probably bidding for the contract. Its consulting army has a big say in what kind of technology is bought and used around the world. But now, after 30 percent annual growth between 1986 and 1990 fed by the frenetic pace of change in the computer industry, Andersen Consulting, until 1989 a part of the Arthur Andersen accounting firm, faces the same problems that are battering computer makers like I.B.M. and Digital Equipment. Companies have moved away from the mainframe systems that were Andersen's historical specialty to systems made up of powerful desktop computers linked by high-speed networks. Retooling a Goliath The lengthy, complicated projects requiring many bodies to handle mundane tasks like programming have given way to shorter projects requiring far fewer programmers but more expert networkers. And the shift, analysts say, will test the very core of Andersen's corporate soul. Some wonder how quickly the Andersen Goliath can retool itself to this new model. Meanwhile, companies like I.B.M., E.D.S., Digital and the Big Six accounting firms, seeking new sources of revenue, are stepping up their own consulting efforts and winning business from Andersen, demoralizing its staff and spurring turnover. And smaller businesses like Cap Gemini of France and the Computer Sciences Corporation of El Segundo, Calif., are an increasing threat. "The whole nature of the business has changed," said George T. Shaheen, the managing partner who runs the privately held consulting firm. A 250-partner task force is rethinking the company's focus and structure and is scheduled to make proposals for change in November. For now, Andersen is concentrating on getting bigger and longer contracts with existing customers. Most of its contracts are now between $5 million and $10 million. "The number of clients is decreasing but revenues stayed flat," said Julie Schwartz, an analyst with Dataquest in Lexington, Mass. "The size of their contracts in the U.S. has been increasing." Andersen has been in the technical consulting business for more than 35 years, ever since it helped General Electric install its first computer in 1954. The consulting side grew so fast going into the 1980's that the consultants decided they should separate from their counterparts at Arthur Andersen & Company, the accounting firm. Not unexpectedly, some of the audit and tax partners resisted, fearing for their own profits, and tension at the firm got so bad that a psychiatrist was brought in to facilitate the split. There were also questions of conflicts of interest, put to rest when the Securities and Exhange Commission gave the go-ahead for the consulting arm to work with audit clients. Just how the two partnerships work is unknown since, as privately held entities under a Swiss umbrella organization called Arthur Andersen & Company S.C., they are not required to public reports. It is known, however that they remain linked both philosophically and financially, sharing some level of profits and expenses. Call It Method/1 Andersen pioneered in the 1960's a step-by-step methodology for handling any computer project. Known as Method/1, it provides a common language for questioning potential clients about what needs to be done and what kinds of software and hardware should be used. It also offers strict guidelines for managing a project and estimating its costs. Method/1, now in its ninth iteration, works through a force of dedicated and well-trained employees (the company spends $157 million per year on training, an average of $7,200 per consultant). They see the computing world uniformly, speak the same language and are tied into a massive international network of expertise. And Andersen spends $264 million a year on computer research and development, with a 1,200-person advanced technology group, getting high grades from industry analysts. "What's most impressive about them is that they do an extensive amount of R.&D. and they stay at the leading edge," Ms. Schwartz said. "They can take that new knowledge and institutionalize it, so the 22-year-olds can implement it. It's an incredible capability. And they are trusted by the Fortune 500." Andersen's young recruits usually arrive with undergraduate degrees in computer science, information systems or engineering. "We prefer to hire them raw -- their loyalty is far higher that way," said Herbert W. Desch, a managing partner who runs the St. Charles training center. The typical candidate, paid in the high $20,000, low $30,000 range, is in the top 5 to 10 percent of his class, with solid communication skills, aggressive attitudes and a desire to move up quickly. (The halls of St. Charles are still filled mostly with white men -- only 10 percent of Andersen's partners are female.) Stanley M. Sword, a manager of the professional education division who has worked at Andersen for more than nine years, was one such recruit. With a degree in finance from the University of Illinois, he was recruited by the Chicago office, attracted by a chance to travel and Andersen's clearly laid out career path. At St. Charles, the rookies learn to fix their sights on partnerships, where the power and the six- and seven-figure salaries are found. There are only two directions on the Andersen career track -- up or out. Many won't make it. Andersen has a 15 percent annual turnover rate which translates into 1,200 of the firm's 8,000 United States-based consultants leaving each year. Only 5 percent of recruits make partner. Andersen's biggest clients -- the $100 million contract category -- include Sears Roebuck, Sun Oil, Northwest Airlines, Banc One, United Airlines and two British Government agencies that are being privatized. While the firm specializes in installing and sometimes running large computer systems for clients, it also helps them decide which computer systems to embrace next. It competes with the management consulting establishment, the likes of (McKinsey & Company and Bain & Company, always with a technological bent. And it makes and sells its own software, pulling in $212 million from that source last year. A. George Battle, senior managing partner in charge of marketing, estimates that Andersen buys, modifies and resells more than $10 billion in computer hardware and software each year. The firm says it has no biases toward any computer vendor, and in fact, Mr. Shaheen claims that Andersen's penchant for "sleeping around" with many manufacturers gives it a strategic advantage over competitors like I.B.M., which naturally favor their own products. The competition is unconvinced. Yes, said Martin Clague, general manager for I.B.M.'s consulting software and services group, I.B.M. will sell its own equipment if the opportunity is there. But, he added, Andersen consultants have their own biases: "If an Andersen consultant knows Digital, he'll recommend Digital." Andersen's services do not come cheap -- senior partners earn $250 an hour. But it has an impeccable reputation for grit in getting an assignment done; it has been known to swallow millions of dollars in cost overruns to meet its commitments. At the Merced County (Calif.) Human Services Agency, Andersen recently created a complex, state-of-the-art system to handle the county's welfare program and vastly underestimated cost. Rita Kidd, county project manager, estimated the overruns at as high as $4 million, but Andersen swallowed them, she said. The main knock on Andersen is that it tends to trample the technology people within a company. "They march through a client like Sherman marched through Georgia," said Mr. Bergstein, who left Andersen in 1989 after 21 years. "They leave bruises and gore all over the place." A multiyear engagement with Sears, Roebuck & Company grew bitter indeed. "Our information-systems people got steamrolled," said Bob Ferkenhoff, now the Sears merchandise group's vice president of information services, who saw the project's start, left for a time, then returned to pick up the pieces. "They tend to have young, high-charged people who use a different methodology and are incented differently than the internal folks. Andersen incents on getting the job done. We focus more on the quality of effort." Steven J. Johnson, Andersen's managing partner for the retail-products industry, admitted that "our biases are toward getting it done rather than making it pretty." He defended the enthusiasm of the young troops, however, claiming "they can work miracles because they don't know any better." The Troops Andersen claims it can move quickly to meet market pressures, saying networks of desktop computers -- client/server networks -- now comprise 70 percent of its work. But critics question how quickly it can retrain its army to be proficient in the client/server environment. "The Andersen way can't work anymore," said Bonnie Digrius, a consultant with the Gartner Group in Stamford, Conn. As Thornton May, a consultant at the Tenex Corporation in Burlington, Mass., sees it: "Success at Andersen is keeping 22-year-old butts on an airplane, charging monopoly rents for average talent. People choose them because they think they've lost control. We argue that you lose more control with 200 22-year-olds running around your systems organization." Added Russ Gullotti, vice president of the services business at Digital: "We can bring in our own army with people who are experienced in these technologies. I'd much rather have that experienced person than a 22-year-old with a lot of energy." Mr. Desch, head of the St. Charles training center, has heard it all. "We don't apologize for it," he said. "The formula works very well. The planning for a project is done by top-level experienced people. Competitors who criticize us for this have all tried to follow our model." But morale inside Andersen, particularly at the partner level, has suffered as work and travel schedules have been increased and the pressure to bring in new business has intensified. Paul Cosgrave, a senior partner in charge of systems integration in the Americas, left in January after 19 years when, he said, he could no longer tolerate the demands on his time. "I was traveling 100 percent of the time," he said. He is now head of AGS Computers, a Nynex company. Though Andersen is still growing quickly in Europe, growth in the United States is slow. Business in the Northeast has been poor for four years and last fall a shakeup rocked the New York office, with 200 consultants leaving or being let go. Despite the evidence of unrest, Mr. Shaheen is sticking with the formula. "The competition says it can't work," he said, "but it has stood the test of the market for 40 years." FUTURISTIC STORES TO ARTIFICIAL INTELLIGENCE CHICAGO -- IN an old Sears warehouse here, Andersen Consulting has built Superstore 2000, the supermarket of the future, complete with self-checkout lines and computerized "chicken idea centers." Food industry executives, some visiting three or four times, come to see what their businesses might look like in 5 to 10 years. For Andersen Consulting, with its $300 million in food-industry fees this year, the center generates streams of new business. There is also a futuristic retail store in Chicago and a hospital in Dallas. But Andersen's commitment to research and development, upon which it spends $264 million a year, goes a great deal further. Three years ago, the firm ponied up $30 million for a 10-year commitment to the legendary artificial intelligence researcher Roger Schank and convinced him to leave Yale. Mr. Schank received a professorship at Northwestern -- and brought along 25 Yale colleagues -- and started the Institute for the Learning Sciences. Here Mr. Schank has been building complex computer-based training "courseware" designed to allow Andersen's army of consultants to get training right at their desktops, via hands-on management games. The courseware, which combines aspects of artificial intelligence and multimedia software, will eventually be offered to clients. In addition, Andersen's 1,200-member advanced technology group, headed by managing partner W. James Fisher, is driving the company's advanced but practical research, applying leading-edge technologies like imaging, neural networks, advanced math modeling and computer-aided software engineering to current consulting jobs. "I came here," said Masud Arjmand, a mathematics Ph.D. who left Texas Instruments two years ago, "because Andersen gave me the opportunity to pursue the most challenging technology but in the context of solving real business problems." Graphic Photos: George Shaheen, managing partner of Andersen Consulting, flanked by sculptures that resemble the firm's young, clean-cut consultants. (Cynthia Howe for The New York Times)(pg. 1); New hires at the firm's training center in St. Charles, Ill. (Cynthia Howe for The New York Times)(pg. 6) Graphs: "Where Anderson Stands" shows prefessional services and systems integration. (Source: Gartner Group) Load-Date: September 6, 1992 End of Document A Robot Researcher Slouching Toward the Physics Lab The New York Times

Time: 04/07/2010  
The Digital Equipment Corporation said it was granting funding to Carnegie Mellon University and the University of Massachusetts at Amherst for studies on artificial intelligence, the process in which computers are made able to perform tasks requiring thought when done by humans. Under its agreement with the University of Massachusetts, Digital will be entitled to an irrevocable royalty-free, nonexclusive license to any technology developed. Patent rights would remain with the university. MAYNARD, Mass., Aug. 12 (Reuters) - The Digital Equipment Corporation said it was granting funding to Carnegie Mellon University and the University of Massachusetts at Amherst for studies on artificial intelligence, the process in which computers are made able to perform tasks requiring thought when done by humans. End of Document CORRECTIONS The New York Times

Time: 07/04/2014  
Big technology companies have a problem anyone would love to have: They are sitting on vast amounts of cash. According to a report by Moody's Investors Service, American companies outside the financial industry were sitting on a combined $1.64 trillion of cash by the end of 2013. And tech giants like Apple, Google and Microsoft had the most. Apple topped the list, with nearly $159 billion. A decade ago, before the iPhone came along, the company was holding about $5.5 billion. Laid out in dollar bills, Apple's current stockpile would cover around 630 square miles. Apple seems happy to let its trove sit untouched, though the company hasn't said why. John Maynard Keynes, the economist, argued that companies tend to hoard cash for three reasons: to perform day-to-day transactions, to protect themselves in the event business slows, and to prepare to make investments should opportunity arise. Apple certainly isn't using its cash for acquisitions. Compared to its competitors, the company spends very little money buying technologies new or old. Google has spent billions on video sites, robots, driverless-car technology and artificial intelligence software. Amazon has bought robot makers, e-commerce services and hardware start-ups. And Facebook has spent more than $20 billion in just the last two months on a messaging platform and virtual reality technology. Yet Apple has barely broken the skin over the last decade, buying AuthenTec, a fingerprint sensor company; Siri, the voice service; and Topsy, a data analytics company. Apple has never even made a single acquisition over a billion dollars. Where are the robots, the driverless cars, the virtual reality goggles? In an interview in February with The Wall Street Journal, Timothy D. Cook, Apple's chief executive, said the company had looked at big companies but had no urge to buy for the sake of buying. ''The money is also not burning a hole in our pocket where we say let's make a list of 10 and pick the best one,'' Mr. Cook said. He said Apple was ''not going to go out and buy something for the purposes of just being big.'' But the money is burning a hole in the pockets of investors who want Apple to use some of its cash to pay dividends, buy back stock or both. Carl Icahn, the vocal billionaire investor, is leading the charge. Rick Lane, an analyst with Moody's who wrote the report on the company's cash holdings, said Apple could be holding onto some of its cash for a rainy day. Apple once fell on ''very difficult times,'' he said, ''and had to rely on, in part, the kindness of others.'' ''Without having to rely on the capital markets, which can be mercurial, it's a kind of self-insurance to have that cash on hand for the times when things go bump in the night,'' he said. So what could Apple buy with its miles of cash? Compared to Google, Apple seems to be focused on the here and now rather than the far-off future. (Google is building autonomous robots and cars.) Apple could leapfrog its competitors and go all in, picking up Mars. (Yes, the planet.) NASA scientists recently said a human mission to Mars with the goal of building a colony would cost about $160 billion. NASA even floated the idea that big corporations could sponsor the trip. If going from iPads to interplanetary missions seems like a stretch, maybe Apple could explore transportation on earth. Last year Philip W. Schiller, Apple's senior vice president for worldwide marketing, said that before the company built the iPhone, executives had discussed building a car. Rather than start from scratch, Apple could take less than 20 percent of its cash and pick up Tesla for around $30 billion. Paint the cars white, slap on an Apple logo, dot an ''i'' before crossing the ''t'' -- and you've got an entirely new product category: iTesla. Of course, Apple would immediately want to jump into the driverless car market-- since that's clearly the future of the industry -- so the company could buy a few artificial intelligence labs and pick up whichever robotics companies Google hasn't already. Or Apple could stick with communications. There are very few companies Apple relies on more than the telecommunications giants. While Apple designs and builds its iPhones and iPads on its own, the company still needs Verizon, AT&T, Sprint and T-Mobile to connect those gadgets to music, video and the Internet. Why not just bypass the telecom companies? T-Mobile, which boasts the fastest Internet service on the planet, is currently worth about $26 billion, about 16 percent of Apple's cash. Sprint is a little more expensive, with a market value of $37 billion. But Apple could pick up both and still have more than $90 billion left. Microsoft can probably feel Apple's pain. In 2002, Microsoft was rich, sitting on $36 billion. While Bill Gates always believed that Microsoft should have enough cash on hand to operate for a year without making a penny, investors disagreed, calling for a dividend. Microsoft tried to hold out, saying it wouldn't bow to investors' demands. Under pressure, the company finally relented, and it issued its first dividend. We all know what happened to Microsoft in the decade that followed. Email: bilton@nytimes.com Twitter: @nickbilton This is a more complete version of the story than the one that appeared in print. http : // bits.blogs.nytimes.com/2014/04/06/apples-deep-pockets-what-159-billion-could-do/ Graphic PHOTO: Timothy D. Cook in Beijing in January. He has said Apple is in no rush to make big acquisitions. (PHOTOGRAPH BY ALEXANDER F. YUAN/ASSOCIATED PRESS) Load-Date: April 7, 2014 End of Document New U.S. Research Aims At Flood of Digital Data The New York Times

Time: 28/12/2010  
Roger C. Schank, a Yale professor who founded two computer companies, yesterday resigned from one, Cognitive Systems Inc., as its chairman and chief executive. The company, based in New Haven, said that Professor Schank would not be replaced and that the highest officer would be Stephen Craig Mott, president and chief operating officer. Mr. Schank, who resigned for personal reasons, will continue as a board member and as an adviser, Cognitive Systems said. Professor Schank, 42 years old, whose specialties are computer science and psychology, was not in his office yesterday, his secretary said, and he could not be reached. He is chairman of Yale's computer science department. Professor Schank founded Cognitive Systems in 1979 and the company went public, traded over-the-counter, in 1986. The company specializes in artificial intelligence, and one of its current products is case-based reasoning technology. The company said the technology automates the collection, interpretation and presentation of data on business cases to help executives make decisions. Cognitive said that Professor Schank would serve as a consultant for expected work on government contracts related to case-based reasoning. Cognitive Systems was hurt last year by a loss of $1.8 million that it attributed to unauthorized trading in speculative securities by its former financial officer, Irwin D. Witt. The company is suing to recover the money. Cognitive Systems was formed about the time several other artificial intelligence companies were being started. But progress has been slower than expected and the early optimism has been tempered. Cognitive Systems said in its early literature, for example, that its systems offered ''all the benefits of having a human expert on your staff, but it never takes a lunch hour or goes on vacation.'' The other company founded by Professor Schank, in 1982, is called Compu-Teach. It combined educational theory and computer programming to supply instructional software. End of Document With Siri, Apple Aims at Search The New York Times

Time: 08/04/2012  
Kent C. Johnson, 40, has been named president of Microrim Inc., the company that in April brought to market Clout, the first artificial intelligence product for microcomputers. He was Microrim's seventh employee when he joined the Bellevue, Wash., company in 1982 as executive vice president and chief operating officer. His task was to bring management skills to Microrim, which had been formed a year earlier by Wayne Erickson, a ''technical guru'' who remains chairman and chief executive. ''My main strength is that I am a businessman,'' said Mr. Johnson, who is a certified public accountant. ''I have built a company that now employs 85 people, has depth of management, a product direction and I've raised financing.'' The Mitsubishi Corporation owns 5 percent of Microrim, representing the Japanese company's first stake in the American computer software business. Clout allows computers to learn English, rather than forcing humans to learn computer jargon. ''It's called artificial intelligence because the computer learns interactively as you work with it,'' says Mr. Johnson. If the computer user tries the word ''gimme,'' the computer would ask for a synonym to learn the meaning and then store ''gimme'' in its memory for future use. As a youth, Mr. Johnson was a logger, like his father. But, he recalls, ''after almost getting killed twice, I decided there must be a better way of making a living.'' He was graduated from the University of Washington in 1967 and received a master's degree in accounting and finance from Seattle University in 1971. He joined Arthur Andersen & Company as an auditor and manager in the consulting division and later was vice president of finance and chief financial officer at Fiberchem Inc. He said that he and Mr. Erickson ''brought to Microrim a small-town ethic which we feel is important.'' He relaxes at a lakeside cabin in the Cascade Mountains where he hopes to teach his sons, now 2 and 7, ''some of the same principles and philosophies, just the way I was reared.'' End of Document Compressed Data; On a Futurists' Forum, Money Backs Up Predictions The New York Times

Time: 22/12/2006  
For the first time since the early days of the auto industry, the General Motors Corporation has bought a minority interest in a small company rather than swallowing it whole. Last week, in a little-noticed move, G.M. paid $3 million for an 11 percent interest in Teknowledge Inc. of Palo Alto, Calif., a small computer company that specializes in applications of artificial intelligence. To the auto giant, $3 million is cash for postage stamps. In this case, however, it is a small bet on what could be a major technological advance. The goal, G.M. officials said, is to develop automated systems that can diagnose problems in the increasingly complex cars of the future. General Motors Corp, in little-noticed move, pays $3 million for 11 percent interest in Teknowledge Inc, small computer concern that specializes in applications of artificial intelligence, Palo Alto, California; links move to effort to use company's knowledge to develop automated systems that can diagnose problems in increasingly complex cars of future; photo (M) A 'Strategic Relationship' Howard H. Kehrl, the vice chairman of G.M., said the investment was intended to cement what G.M. has described as a ''strategic relationship'' between the auto maker and the Silicon Valley concern. This will permit G.M. to make use of the smaller company's expertise without formally making it part of its vast organization. Other large companies that have acquired small, entrepreneurial operations have suffered the loss of creative talent who did not feel comfortable in a corporate structure. ''This kind of a minority interest is enough to create a stake for us to want to work with them, to help them develop applications for our business,'' Mr. Kehrl said, ''and it gives them some capital. It's a kind of thing we will probably be doing more of in the future.'' Teknowledge, founded in 1981 by 20 university computer scientists, is developing what are known as ''expert systems'' that can make judgments based on partial information. ''Expert systems store knowledge instead of data,'' said Nils L. Muench, a G.M. computer scientist. ''They can perform reasoning and give probabilistic answers. Essentially, they do what a person with expert knowledge can do.'' ''It is like when you reason about a problem,'' said Lee Hecht, the chairman of Teknowledge. ''You draw on bits of knowledge related to it and one tends to suggest another. For example, if you turn the key of a car and the engine doesn't start, you might pull the knob for the lights. If both don't work, it suggests an electrical problem.'' An expert system for diagnosing automotive ills, Mr. Hecht said, would combine thousands of such relationships in a program that would react to each individual situation, rather than manipulating data in a predetermined way, as with most existing programs. The expert-systems approach has already been applied to medical diagnosis, geological surveys and the layout of computer systems, said John McDermott, a professor and computer specialist at Carnegie-Mellon University. ''If you can come up with a smart diagnostic system, you probably would have a more popular car,'' Professor McDermott said. He added that a ''large percentage'' of the several hundred active artificial intelligence applications researchers in the country were working for, or were affiliated with, Teknowledge. Mr. Hecht said the company has 87 full-time employees and 25 consulting scientists. Sales in 1983, he said, were ''more than $2 million.'' A Change in Philosophy Mr. Kehrl said the difficulty in hiring employees with experience in this still arcane field contributed to G.M.'s decision to invest in Teknowledge. He added, however, that the move also represented a change in management philosophy. ''Its a bit of a right turn, really,'' he said, ''and it is a more outward-directed kind of an approach. We are trying to get the best in the world to help run the business.'' In the past, he acknowledged, G.M. was ''a more inward company'' that felt ''it had or could do everything inside.'' But in the last few years, G.M. has established joint ventures with Japanese companies. One is with the Toyota Motor Company to produce small cars in California, beginning later this year, for sale as Chevrolets. Mr. Hecht, who said Teknowledge is owned largely by its founders, employees and some venture capital companies, added that neither side expects the company to be acquired by G.M. ''G.M. has large requirements and we plan to service them extensively,'' he said, ''but it is our plan to grow as an independent organization.'' Plans to Diversify Roger B. Smith, the chairman of G.M., has spoken repeatedly of his determination to diversify, and with G.M.'s cash balances swelling as a result of record profits, there have been rumors in the investment community that it may soon make a major acquisition. However, Mr. Kehrl said of Teknowledge, ''We want the company to exist as a commercial entity, with its own management.'' Although a fully self-diagnostic car would be ideal, Mr. Kehrl said, he thought that the high cost of equipping every area of a vehicle with sensors to feed information to an onboard computer would make this unfeasible. Instead, he said, the diagnostic facility would probably be situated at auto dealers' service departments, with links to the parent company. ''You would like to have the car so it absolutely diagnoses itself, but then you wind up with a lot of extra costs for equipment that has very high reliability,'' he said. The likely outcome, he added, is that the complex electronic systems being added to automobiles could be self-diagnostic, with the dealership system assisting mechanics to repair other functions. A rudimentary computer-diagnostic system of the type G.M. envisions exists today. Mechanics working on Buicks can call an 800 number to reach the division's headquarters. Technicians there assist in auto repair, drawing on a data bank of previous problems and solutions. An ''expert system'' in a computer would eliminate the middleman, its advocates say. How soon could such a system be developed? Mr. Hecht predicts one in the ''intermediate'' future. ''We're not talking months, but we're not talking a decade either,'' Correction Because of an editing error, an article in Business Day on Thursday about General Motors' acquisition of a stake in Teknowledge Inc. misstated the acquisition date. It was April 9. Correction-Date: May 5, 1984, Saturday, Late City Final Edition Graphic photo of Lee Hecht at meeting End of Document TRAVEL ADVISORY; Swiss Expo: Four Towns and a Barge The New York Times

Time: 21/09/2008  
training combined with a master's degree are advantages of a program offered by the General Electric Company. Each year, it selects a dozen or 15 college seniors for its software technology program. David E. Priest, manager-software engineering services, describes it this way: ''Our aim is to develop software professionals for future technical leadership positions within the company. We offer a unique combination of academic and industrial training.'' In fact, he knows of no other company that offers such a program. Mr. Priest defines software engineering as the ''application of sound engineering principles to development and maintaining of software.'' G.E. began its program in 1980 with two students when it could not find enough young software experts. Software professionals, who design computer programs needed to solve complex engineering, mathematics and production problems, work closely with electrical engineers, physicists, mathematicians, biologists and others. ''We provide the students with real-world projects - not just the software engineering concepts they might get in college,'' Mr. Priest said. An attraction is a salary of more than $28,000. Now, six years later, the program is larger, averaging 12 or 15 students a year. With the dozen hired this spring, 50 have joined the program. Mr. Priest points out that even now there are few strong programs in software engineering, mentioning those at the Wang Institute and the University of Seattle at the master's level. Instead of hiring holders of master's degrees in software for the program, G.E. prefers to train its own experts, making sure they receive a master's degree. One reason is the burgeoning growth of computers and the need for ever more advanced programming. Mr. Priest and his recruiters also regularly take a look at seniors at the Massachusetts Institute of Technology, Cornell, Carnegie-Mellon, Purdue and the University of Illinois. ''We hired a young woman last spring from Brown University,'' he said. Mr. Priest wants the students to be bright - ''in the top 10 or 15 percent of their class'' - but he also insists on communications and leadership skills. ''I expect basic courses in physics, mathematics and chemistry, and computer science or engineering majors,'' Mr. Priest said. The program begins each June with an in-house eight-week software engineering course, which includes learning languages of programming. Computer languages needed by G.E.'s professionals include C and Lisp, as well as ADA, the language used by the Government's Defense Department. While the program stresses the technical, students spend part of the first summer learning how to communicate. ''They must be able to stand in front of an audience and explain technical projects to top management,'' Mr. Priest said. In the fall, they receive hours off each week to take courses toward their master's degree in the Schenectady, N.Y., area. The choices include the State University of New York at Albany and Union College, but all are currently studying at the Rensselaer Polytechnic Institute, in Troy. The hands-on-training that hones the professional skills G.E. wants includes spending a year each on three projects working with a senior scientist. Areas include graphics, robotics, factory simulation, CAD/CAM (shorthand for computer-assisted design and computer-assisted manufacturing), artificial intelligence, image processing, formal language theory and control systems. Some of the most intriguing assignments deal with the growing field of artificial intelligence - programming that involves ''reasoning with incomplete and uncertain information,'' according to Mr. Priest. In addition to gaining technical knowledge through what Mr. Priest calls osmosis, students can integrate their course work with work projects. After completion of the three-year program, including their master's degree, students take jobs in G.E.'s far-flung factory and research empire. G.E. ranks as one of the nation's most decentralized large companies, producing refrigerators, light bulbs, locomotives, robots, aircraft engines, aerospace, electronics, medical diagnostic and power generation equipment in such places as Schenectady; Santa Clara, Calif.; Pittsfield, Mass.; Cincinnati, and Milwaukee. Its G.E. Credit company ranks as one of the largest lenders in the world. Recently G.E. diversified into new areas with the acquisition of RCA, including the NBC television and radio subsidiary. Last week on a trip to New York, Mr. Priest visited NBC to determine how students could eventually help with software needs. Graphic drawing End of Document INSIDE The New York Times

Time: 28/01/2014  
Google has acquired London-based start-up DeepMind to expand further into the field of artificial intelligence. DeepMind describes itself as a "cutting-edge artificial intelligence company." It combines techniques from machine learning and systems neuroscience to build powerful general-purpose learning algorithms. The company was founded by Demis Hassabis, Shane Legg and Mustafa Suleyman. Its first commercial applications are in simulations, e-commerce and games. DeepMind investors include Founders Fund, the venture capital firm run by former PayPal executive Peter Thiel, and Horizons Ventures, headed by Li Ka-shing, one of the richest people in the world. Google reportedly paid more than $400 million for DeepMind, which would make it the company's largest European acquisition so far. Artificial intelligence, or AI, is a branch of computer science that aims to make computers behave more like humans, with capabilities such as reasoning, learning and planning. Google already uses this type of technology for many projects, such as its expanding language-translation services. Google spokesman Tim Drinan confirmed the acquisition, but declined to comment further Monday. An e-mail sent to DeepMind seeking comment was not returned. Load-Date: January 28, 2014 End of Document STORY STOCKS USA TODAY

Time: 27/01/2014  
Google says that it has purchased the British startup DeepMind, an artificial intelligence company founded by a 37-year old former chess prodigy and computer game designer.  
The American tech giant's London office confirmed a deal had been made but refused to offer a purchase price, which is reportedly $500 million. The company was founded by researcher Demis Hassabis together with Shane Legg and Mustafa Suleyman.  
Hassabis, who is on leave from University College London, has investigated the mechanisms that underlie human memory.  
Artificial intelligence uses computers for tasks normally requiring human intelligence, like speech recognition or language translation. DeepMind says the company, based in London, specializes in algorithms and machine learning.  
Google, like other tech giants such as Facebook, are anxious to develop systems that work like the human brain.

Time: 10/02/2010  
built his reputation by finding ways to convert sophisticated research into money-making products during the last two decades at Texas Instruments Inc. Those kinds of payoffs have been slow to develop for the 20 companies sharing research costs at the Microelectronics Computer and Technology Corporation, which was created four years ago in an effort to counter advances by the Japanese in electronics. Yet Mr. Dove, who will become the chairman and chief executive of the consortium, familiarly known as M.C.C., in two weeks, sees a wave of new products just over the horizon. ''Our programs have long-range goals, but you'll see me putting emphasis on setting up interim milestones, with more product spin-outs along the way,'' he said. ''They'll be random, but you'll see more.'' M.C.C., based in Austin, Tex., and one of its members, the NCR Corporation, yesterday announced the first commercial product of a software technology developed by the consortium. For the United States, M.C.C. was an unusual business strategy when conceived five years ago by William C. Norris, founder of the Control Data Corporation. He saw Japan's reach toward the so-called Fifth Generation of computer technology as a threat both to the American economy and computer industry. Mr. Norris also believed that cooperation in jointly financed research was the best way for American electronics companies to stay competitive. At the time, Japanese industry had pooled resources and threatened to outdistance American efforts in tackling the costly research needed to achieve the next stage of advanced computer operations. Many in this country doubted that American companies could find a way to cooperate and keep pace. Indeed, some companies that joined M.C.C. complained for months of competitive jealousies. Yet, members say they generally acquiesced to urgings for cooperation from Adm. Bobby R. Inman, the former deputy director of the Central Intelligence Agency who was M.C.C.'s first chairman. He left last December. The consortium, which has nearly 400 researchers and a budget this year of $75 million, has focused on applied research in four disciplines, all tied to building faster and more capable computers. They are computer-chip packaging, advanced computer architecture, software development and computer-aided designs for advanced computer chips called Very Large Scale Integrated Circuits. At Mr. Dove's urging, M.C.C. soon will add a program in one of today's hottest research fields - superconductivity, a condition in which materials lose all electrical resistance. In the past this condition could be reached only at extremely low temperatures. More recently it has been reached at more moderate temperatures. Three members of the consortium - Unisys, Allied-Signal and Lockheed Missiles and Space - have said they would quit at year-end, and a fourth, General Electric, said that while it would keep its yearly membership, it would withdraw from specific research programs. Mr. Dove, who is 59 years old, has been an executive vice president at Texas Instruments since 1982. In his 28 years with the company, he had a hand in developing such sophisticated products as computer systems used in oil exploration, automatic pilots for low-flying military aircraft, and a computer used for weather forecasting and ballistic missile research. He also has been the senior executive directing Texas Instruments' investments in artificial intelligence research. John R. Hanne, head of M.C.C.'s computer-aided design project, has worked with Mr. Dove at Texas Instruments. He said Mr. Dove proved particularly adept in keeping long-range research headed toward marketable products. ''Grant is one of a very few people who are very accomplished managers of high-tech business projects,'' he said, echoing the comments of other Texas Instruments executives. Mr. Dove was particularly successful in achieving consensus in a company that has a reputation for confrontation. ''If there is anything I've learned how to do inside T.I., it is to pull together diverse groups of people and move them toward a common goal,'' Mr. Dove said. Asked to elaborate, he said he was trained as a systems engineer - he has an undergraduate degree in electrical engineering from Virginia Polytechnic Institute - but seemed to have a natural gift for management. Colleagues at Texas Instruments said that Mr. Dove was both personable and a good listener, and sought consensus in management decisions. ''I've never had problems giving credit where credit is due,'' he said. Member companies collectively have about 100 people at M.C.C., monitoring research and manipulating ideas that might be worked into commercial products. Mr. Dove said he already has told member companies that he intends to quicken the pace. Boeing, Honeywell and Minnesota Mining and Manufacturing, among other member companies, already have publicly discussed applications of M.C.C. technology in their research and production operations. ''M.C.C. has allowed us to get at things that are more risky, and broader-based, and has given us the ability to share in those risks rather than bear them ourselves,'' said Timothy D. Fehr, vice president for engineering at the Boeing Electronics Company. Still, most companies have been secretive about their applications of M.C.C. technology, which Mr. Dove said he wanted to change. ''It's important to get the word out,'' he said. He said that Texas Instruments might join the consortium and added that he was also wooing many smaller companies and campaigning for current members to join more programs. ''The need for teamwork is much clearer now than it was even in 1984 and '85, when the whole idea was being debated,'' he said. ''There are probably close to 50 different kinds of consortia under way now. The debate has been won.'' M.C.C.'S RESEARCH AGENDA Advanced Computer Architectures Includes three areas - artificial intelligence, systems technology and designing easier-to-use software. Semiconductor Packaging Involves designing high-density chips covering connectors, materials, test and cooling technology and process reliability. Software Technology Includes research on how teams of designers, working simultaneously, can also work together to create large, complex software systems. Very Large Scale Integrated Circuits and Computer Aided Design Involves developing computer-aided design systems that reduce the amount of time and effort needed to design future generation electronic systems. Superconductivity Project specifications are undecided, but they are expected to deal with designs for faster and more powerful electronic systems. Graphic Photo of Grant A. Dove (NYT/Jim Wilson) End of Document BUSINESS DIGEST The New York Times

Time: 08/02/2004  
The Sperry Corporation said it would buy an artificial intelligence-based product from Texas Instruments Inc. for about $42 million over three years. The so-called Explorer Systems will be used in Sperry's Knowledge System product line. Sperry Corporation says it would buy artificial intelligence-based product from Texas Instruments for about $42 million over three years (S) End of Document Approximating Life The New York Times

Time: 05/07/2012  
 Educators and policymakers have long dreamed of providing universal, low cost, first-class higher education. Their wish may come true soon thanks to an unlikely source: Silicon Valley. The mecca of the technology universe is in the process of revolutionizing higher education in a way that educators, colleges and universities cannot, or will not. One of the men responsible for what may be an Athens-like renaissance is Sebastian Thrun, Google's vice president and pioneer in artificial intelligence and robotics. Known in science circles for his engineering feats -- like Stanley, the self-driving car -- Thrun is using his technological prowess to make quality higher education available to the world. I recently interviewed him on my radio show, "Morning In America." Last year, while teaching a graduate level artificial intelligence class at Stanford University, Thrun lamented that his course could only reach 200 students in the suburbs of Palo Alto. So, he decided to offer his own free online class, with the same homework, quizzes and tests that he gives to Stanford students. He announced the proposal with a single e-mail. Before he knew it, he had a flood of takers. "Usually I reach about 200 students and now I reach 160,000," said Thrun incredulously. "In my entire life of education I didn't have as much an impact on people as I had in these two months." By utilizing online videos and educational resources, Thrun's class was being accessed by students from all corners of the world. In fact, the students themselves translated the class for free from English into 44 languages. Until now, an overwhelming number of these students -- many in developing countries and lacking standard education credentials -- never would have had a chance at a Stanford-level education. Yet, their appetite for quality education was strong. In fact, of all the students taking Thrun's class globally and at Stanford, the top 410 students were online. The 411th top performer was a Stanford student. "We just found over 400 people in the world who outperformed the top Stanford student," Thrun said.. Realizing the potential at his fingertips, Thrun launched Udacity, an independent online education company that provides high quality education at low cost to virtually everyone. Udacity offers 11 STEM courses like "Introduction to Physics," "Intro to Computer Science," and "Web Application Engineering" -- all free. There are no admissions offices and anyone can sign up. After the class, students can choose to certify their skills online or in one of Udacity's 4,500 testing centers for a fee. Those certificates can then be sent to employers. In one course you can learn to make your own Google-style search engine in just seven weeks. The reaction has been overwhelming. "People really want good education. There is a huge need," Thrun said. "Hundreds of thousands of people just sign up because they really care. They really want to advance themselves and their lives and they don't want to pay $50,000 or $100,000 to get there." The classes are structured much like university classes. But instead of traditional types of lectures, all-star professors give video presentations that directly engage and challenge students. Thrun is using technology not only to transform educational access and curriculums, but also teaching. For the past thousand years, professors have been lecturing at students. "[It's] like trying to lose weight by watching a professor exercise," quips Thrun. Now he is leading a new charge -- interactive, student focused technology education. The results are inspiring. On my radio show alone early one morning, several listeners called in to say they already took classes through Udacity. One man had his sights set on graduate school but was too busy with family and work to ever finish along a traditional path. Now, through Udacity, he can take the STEM classes he wants when he wants. Another man, age 53, decided to change careers and go back to a local college to study computer science. When he heard of Udacity, he dropped out of school and signed up for an online course. He said he learned more in several weeks with Udacity than he did in an entire semester at the local college, and he paid nothing for it. As you can imagine, Thrun's enterprise has rattled the foundations of the education establishment. His critics say that a Udacity certificate is worth nothing and how can one know the true identity of a student on the free-for-all jungle that is the Internet? I raised these questions to Thrun. He said Udacity has already partnered with more than 20 companies who verify and accept the certificates of course completion. Some are already hiring graduates of Udacity courses. Thrun is also working with other companies to design and tailor classes to specific needs in the work force. Soon, Udacity will be launching in-person testing centers to verify a student's knowledge and skills. Udacity is simultaneously meeting the educational needs of the public and the vocational requirements of the labor force directly and efficiently, more so than we can say of many universities and colleges. I asked Thrun whether his enterprise and others like it will be the end of higher education as we know it -- exclusive enclaves for a limited number of students at high tuitions? "I think it's the beginning of higher education," Thrun replied. "It's the beginning of higher education for everybody." Much of traditional American higher education prides itself on a false promotion of diversity, opportunity and excellence. But to my knowledge, with one class alone, Thrun has provided a level of diversity, opportunity and academic rigor not seen before. People from any country, any background and any income level can receive an elite education at virtually no cost. We have been talking about equal educational opportunity for years. What is going on here may be its true advent. Follow us on Twitter @CNNOpinion Join us on Facebook/CNNOpinion The opinions expressed in this commentary are solely those of William J. Bennett. Load-Date: July 6, 2012 End of Document Know Yahoo's Marissa Mayer in 11 facts CNN Wire

Time: 17/07/2012  
As part of a seismic shift in online learning that is reshaping higher education, Coursera, a year-old company founded by two Stanford University computer scientists, will announce on Tuesday that a dozen major research universities are joining the venture. In the fall, Coursera will offer 100 or more free massive open online courses, or MOOCs, that are expected to draw millions of students and adult learners globally. Even before the expansion, Daphne Koller and Andrew Ng, the founders of Coursera, said it had registered 680,000 students in 43 courses with its original partners, Michigan, Princeton, Stanford and the University of Pennsylvania. Now, the partners will include the California Institute of Technology; Duke University; the Georgia Institute of Technology; Johns Hopkins University; Rice University; the University of California, San Francisco; the University of Illinois, Urbana-Champaign; the University of Washington; and the University of Virginia, where the debate over online education was cited in last's month's ousting -- quickly overturned -- of its president, Teresa A. Sullivan. Foreign partners include the University of Edinburgh in Scotland, the University of Toronto and EPF Lausanne, a technical university in Switzerland. And some of them will offer credit. ''This is the tsunami,'' said Richard A. DeMillo, the director of the Center for 21st Century Universities at Georgia Tech. ''It's all so new that everyone's feeling their way around, but the potential upside for this experiment is so big that it's hard for me to imagine any large research university that wouldn't want to be involved.'' Because of technological advances -- among them, the greatly improved quality of online delivery platforms, the ability to personalize material and the capacity to analyze huge numbers of student experiences to see which approach works best -- MOOCs are likely to be a game-changer, opening higher education to hundreds of millions of people. To date, most MOOCs have covered computer science, math and engineering, but Coursera is expanding into areas like medicine, poetry and history. MOOCs were largely unknown until a wave of publicity last year about Stanford University's free online artificial intelligence course attracted 160,000 students from 190 countries. Only a small percentage of the students completed the course, but even so, the numbers were staggering. ''The fact that so many people are so curious about these courses shows the yearning for education,'' said Molly Corbett Broad, president of the American Council on Education. ''There are going to be lots of bumps in the road, but this is a very important experiment at a very substantial scale.'' So far, MOOCs have offered no credit, just a ''statement of accomplishment'' and a grade. But the University of Washington said it planned to offer credit for its Coursera offerings this fall, and other online ventures are also moving in that direction. David P. Szatmary, the university's vice provost, said that to earn credit, students would probably have to pay a fee, do extra assignments and work with an instructor. Experts say it is too soon to predict how MOOCs will play out, or which venture will emerge as the leader. Coursera, with about $22 million in financing, including $3.7 million in equity investment from Caltech and Penn, may currently have the edge. But no one is counting out edX, a joint venture of Harvard and the Massachusetts Institute of Technology, or Udacity, the company founded by Sebastian Thrun of Stanford, who taught the artificial intelligence course last year. Each company offers online materials broken into manageable chunks, with short video segments, interactive quizzes and other activities -- as well as online forums where students answer one another's questions. But even Mr. Thrun, a master of MOOCs, cautioned that for all their promise, the courses are still experimental. ''I think we are rushing this a little bit,'' he said. ''I haven't seen a single study showing that online learning is as good as other learning.'' Worldwide access is Coursera's goal. ''EPF Lausanne, which offers courses in French, opens up access for students in half of Africa,'' Ms. Koller said. Each university designs and produces its own courses and decides whether to offer credit. Coursera does not pay the universities, and the universities do not pay Coursera, but both incur substantial costs. Contracts provide that if a revenue stream emerges, the company and the universities will share it. Although MOOCs will have to be self-sustaining some day -- whether by charging students for credentials or premium services or by charging corporate recruiters for access to the best students -- Ms. Koller and university officials said that was not a pressing concern. About two-thirds of Coursera's students are from overseas, and most courses attract tens of thousands of students, an irresistible draw for many professors. ''Every academic has a little soapbox, and most of the time we have five people listening to us,'' said Scott E. Page, a University of Michigan professor who taught Coursera's model thinking course and was thrilled when 40,000 students downloaded his videos. ''By most calculations, I had about 200 years' worth of students in my class.'' Professors say their in-class students benefit from the online materials. Some have rearranged their courses so that students do the online lesson first, then come to class for interactive projects and help with problem areas. ''The fact that students learn so much from the videos gives me more time to cover the topics I consider more difficult, and to go deeper,'' said Dan Boneh, a Stanford professor who taught Coursera's cryptography course. The Coursera contracts are not exclusive, so many of its partner universities are also negotiating with several online educational entities. ''I have talked to the provost at M.I.T. and to Udacity and 2Tor,'' which provides online graduate programs for several universities, said Peter Lange, the provost of Duke University. ''In a field changing this fast, we need flexibility, so it's very possible that we might have two or three different relationships.'' One looming hurdle is overcoming online cheating. ''I would not want to give credit until somebody figures out how to solve the cheating problem and make sure that the right person, using the right materials, is taking the tests,'' said Antonio Rangel, a Caltech professor who will teach Principles of Economics for Scientists in the fall. Udacity recently announced plans to have students pay $80 to take exams at testing centers operated around the world by Pearson, a global education company. Grading presents some questions, too. Coursera's humanities courses use peer-to-peer grading, with students first having to show that they can match a professor's grading of an assignment, and then grade the work of five classmates, in return for which their work is graded by five fellow students. But, Ms. Koller said, what would happen to a student who cannot match the professor's grading has not been determined. It will be some time before it is clear how the new MOOCs affect enrollment at profit-making online institutions, and whether they will ultimately cannibalize enrollment at the very universities that produce them. Still, many professors dismiss that threat. ''There's talk about how online education's going to wipe out universities, but a lot of what we do on campus is help people transition from 18 to 22, and that is a complicated thing,'' said Mr. Page, the Michigan professor, adding that MOOCs would be most helpful to ''people 22 to 102, international students and smart retired people.'' Eventually, Ms. Koller said, students may be able to enroll in a set of MOOCs and emerge with something that would serve almost the same function as a traditional diploma. ''We're not planning to become a higher-education institution that offers degrees,'' she said, ''but we are interested in what can be done with these informal types of certification.'' http : // www.nytimes.com Graphic PHOTO: Daphne Koller and Andrew Ng of Stanford are adding 12 universities to Coursera, the online education venture they founded. (PHOTOGRAPH BY RAMIN RAHIMIAN FOR THE NEW YORK TIMES) (A14) Load-Date: July 17, 2012 End of Document A Calculus of Writing, Applied to a Classic The New York Times

Time: 05/03/2012  
The pitch for the online course sounds like a late-night television ad, or maybe a subway poster: ''Learn programming in seven weeks starting Feb. 20. We'll teach you enough about computer science that you can build a Web search engine like Google or Yahoo.'' But this course, Building a Search Engine, is taught by two prominent computer scientists, Sebastian Thrun, a Stanford research professor and Google fellow, and David Evans, a professor on leave from the University of Virginia. The big names have been a big draw. Since Udacity, the for-profit startup running the course, opened registration on Jan. 23, more than 90,000 students have enrolled in the search-engine course and another taught by Mr. Thrun, who led the development of Google's self-driving car. Welcome to the brave new world of Massive Open Online Courses -- known as MOOCs -- a tool for democratizing higher education. While the vast potential of free online courses has excited theoretical interest for decades, in the past few months hundreds of thousands of motivated students around the world who lack access to elite universities have been embracing them as a path toward sophisticated skills and high-paying jobs, without paying tuition or collecting a college degree. And in what some see as a threat to traditional institutions, several of these courses now come with an informal credential (though that, in most cases, will not be free). Consider Stanford's experience: Last fall, 160,000 students in 190 countries enrolled in an Artificial Intelligence course taught by Mr. Thrun and Peter Norvig, a Google colleague. An additional 200 registered for the course on campus, but a few weeks into the semester, attendance at Stanford dwindled to about 30, as those who had the option of seeing their professors in person decided they preferred the online videos, with their simple views of a hand holding a pen, working through the problems. Mr. Thrun was enraptured by the scale of the course, and how it spawned its own culture, including a Facebook group, online discussions and an army of volunteer translators who made it available in 44 languages. ''Having done this, I can't teach at Stanford again,'' he said at a digital conference in Germany in January. ''I feel like there's a red pill and a blue pill, and you can take the blue pill and go back to your classroom and lecture your 20 students. But I've taken the red pill, and I've seen Wonderland.'' Besides the Artificial Intelligence course, Stanford offered two other MOOCs last semester -- Machine Learning (104,000 registered, and 13,000 completed the course), and Introduction to Databases (92,000 registered, 7,000 completed). And this spring, the university will have 13 courses open to the world, including Anatomy, Cryptography, Game Theory and Natural Language Processing. ''We're considering this still completely experimental, and we're trying to figure out the right way to go down this road,'' said John Etchemendy, the Stanford provost. ''Our business is education, and I'm all in favor of supporting anything that can help educate more people around the world. But there are issues to consider, from copyright questions to what it might mean for our accreditation if we provide some official credential for these courses, branded as Stanford.'' Mr. Thrun sent the 23,000 students who completed the Artificial Intelligence course a PDF file (suitable for framing) by e-mail showing their percentile score, but not the Stanford name; 248 students, none from Stanford, earned grades of 100 percent. For many of the early partisans, the professed goal is more about changing the world than about making money. But Udemy, a startup with backing from the founders of Groupon, is hoping that wide use of its site could ultimately generate profits. And Mr. Thrun's new company, Udacity, which is supported by Charles River Ventures, plans to, essentially, monetize its students' skills -- and help them get jobs -- by getting their permission to sell leads to recruiters. ''We're going to have detailed records on thousands of students who have learned these skills, many of whom will want to make those skills available to employers,'' said Mr. Evans, the Virginia professor. ''So if a recruiter is looking for the hundred best people in some geographic area that know about machine learning, that's something we could provide, for a fee. I think it's the cusp of a revolution.'' On Feb. 13, the Massachusetts Institute of Technology, which has been posting course materials online for 10 years, opened registration for its first MOOC, a circuits and electronics course. The course will serve as the prototype for its MITx project, which will eventually offer a wide range of courses and some sort of credential for those who complete them. The Georgia Institute of Technology is running an experimental two-semester MOOC, known as Change 11, a free-floating forum that exists more in the online postings and response of the students -- only two of whom are getting Georgia Tech credit -- than in the formal materials assigned by a rotation of professors. Next year, Richard DeMillo, director of Georgia Tech's Center for 21st Century Universities, hopes to put together a MOOSe, or massive open online seminar, through a network of universities that will offer credit. Udemy recently announced a new Faculty Project, in which award-winning professors from universities like Dartmouth, the University of Virginia and Northwestern offer free online courses. Its co-founder, Gagen Biyani, said the site has more than 100,000 students enrolled in its courses, including several, outside the Faculty Project, that charge fees. Experts say several factors have helped propel MOOCs to the center of the education stage, including improved technology and the exploding costs of traditional universities. ''We also now have the example of for-profit colleges that have shown that it's perfectly possible to go to scale online,'' said Kevin Carey, policy director of Education Sector, an independent policy institute. Five years ago, George Siemens started a MOOC on what was happening in open education, hoping to do for teaching what M.I.T.'s OpenCourseWare had done for content: it attracted 2,300 participants, with a syllabus translated into several languages. Mr. Siemens, a professor at Athabasca University, a publicly-supported online Canadian institution, said it was quickly apparent that the format created distinctive social networks, as students carried on wide-ranging discussions on their own. ''A lot of the relationships formed through that first course are still continuing today,'' said Mr. Siemens, who is also a facilitator of Georgia Tech's program. ''What we found was that in a MOOC, instead of the classroom being the center, it becomes just one node of the network of social interactions.'' The current, more technically focused MOOCs are highly automated, with computer-graded assignment and exams. But there is still plenty of room for social interaction. The Stanford MOOCs, for example, included virtual office hours and online discussion forums where students could ask and answer questions -- and vote on which were important enough to filter up the professor. ''In a classroom, when you ask a question, one student answers and the others don't get a chance,'' Mr. Thrun said. ''Online, with embedded quizzes, everyone has to try to answer the questions. And if they don't understand, they can go back and listen over and over until they do.'' Just as a child who falls while learning to ride a bike is not told ''You get a D,'' but is encouraged to keep trying, he said, online classes, where students can work at their own pace, can help students keep practicing until they master the content. ''The goal should be to get everybody to A+ level,'' he said. Several students in Mr. Thrun's class last semester, contacted by e-mail, said the MOOC worked for them. Balakrishnan Srinivasan, 45, a computer engineer in Bangalore, said he frequently replayed the videos, which made him ''feel as if I had a personal tutor.'' He earned a 94.8 in Artificial Intelligence and has signed up for both Udacity courses. Brian Guan, 44, a Malaysian-born software engineer who lives in Palo Alto, Calif., offered his own utopian vision in an e-mail interview: ''I wish that the always-available, always-replayable and free nature of this style of learning can help to elevate education/knowledge for all of human kind.'' http : // www.nytimes.com Graphic PHOTOS: Sebastian Thrun, left, a Stanford professor, and Andy Brown, a course manager, recording in their studio in Palo Alto, Calif. (PHOTOGRAPH BY MAX WHITTAKER FOR THE NEW YORK TIMES) Part of a lesson for computer science students in a Massive Open Online Course. (PHOTOGRAPH BY THRUN@GOOGLE.COM) (A13) Load-Date: March 5, 2012 End of Document Learning Curve: No Longer Just A Human Trait The New York Times

Time: 18/07/2012  
few months ago, free online courses from prestigious universities were a rarity. Now, they are the cause for announcements every few weeks, as a field suddenly studded with big-name colleges and competing software platforms evolves with astonishing speed. In a major development on Tuesday, a dozen highly ranked universities said they had signed on with Coursera, a new venture offering free classes online. They still must overcome some skepticism about the quality of online education and the prospects for having the courses cover the costs of producing them, but their enthusiasm is undimmed. But at universities that have not yet seized a piece of this action, the response ranges from curiosity to fear of losing a crucial competition. When University of Virginia trustees ousted their president last month -- a decision they later reversed -- one reason cited was concern about being left behind online. (Virginia was included in Tuesday's announcement.) ''There's panic,'' said Kevin Carey, director of education policy at the New America Foundation, a nonpartisan research group. ''Whether it's senseless panic is unclear.'' Massive open online courses, or MOOCs, let colleges reach vast audiences at relatively low cost, but they have not yet made money from them. And if it becomes possible in years to come to get a complete college education from an elite institution online, free or at relatively low cost, experts wonder whether some colleges will find it harder to attract students willing to pay $20,000, $40,000 or even $60,000 a year for the traditional on-campus experience. Online classes have been around for years, with technology evolving to include multimedia features and interaction among students and faculty. What is new is the way top colleges are jumping in with free courses -- in effect, throwing open the doors digitally. So far, most people signing up live in foreign countries. But MOOCs will become more appealing to domestic students when they give course credits toward a degree, something the elite universities have not yet done. The University of Washington says it plans to do so, and it may be just a matter of time before earning credits becomes standard. ''The people who should be worried about this are the large tier of American universities -- especially the expensive private schools -- that are not elite and don't have the same reputation'' as the big-name universities now creating MOOCs, said Anya Kamenetz, an author who writes on the future of higher education. Residential colleges already attract far less than half of the higher education market. Most enrollment and nearly all growth in higher education is in less costly options that let students balance classes with work and family: commuter colleges, night schools, online universities. Most experts say there will always be students who want to live on campus, interacting with professors and fellow students, particularly at prestigious universities. But as a share of the college market, that is likely to be a shrinking niche. The elite universities will be best able to compete with low-cost alternatives because their large endowments make them less dependent on tuition income, and they can lower their effective prices through generous financial aid, said John Nelson, a managing director at Moody's Investors Service who analyzes higher education finances. Analysts say that universities will inevitably try to make money from MOOCs, whether by charging tuition or not. Software companies working with colleges have looked into advertising, or selling information on students to prospective employers. William E. Kirwan, chancellor of the University System of Maryland, noted that a few public colleges, including his system's University College, already offer mostly online courses. In the future, he said, the standard class will be a hybrid of in-person and online elements, which Maryland is experimenting with. ''We think this approach can cut costs by about 25 percent,'' he said, ''enabling each professor to work with more students, while producing a clear improvement in learning outcomes.'' For a decade, Carnegie Mellon University's Open Learning Initiative has created free online courses. But for many educators, Stanford fired the starting gun last fall, with a free online course in artificial intelligence that drew 160,000 students. The Massachusetts Institute of Technology started a free class project, MITx, in December. The next month, a Stanford professor who helped teach the artificial intelligence class founded Udacity, a company offering free courses in partnership with colleges and professors. In April, Stanford, Princeton, the University of Pennsylvania and the University of Michigan joined forces with Coursera to offer free classes. In May, Harvard teamed with M.I.T. to create a similar venture, edX. In the last week, more universities signed on with Coursera. ''Our participation was finalized literally over the weekend,'' said J. Milton Adams, vice provost at the University of Virginia, which listed five free courses. ''I'm going to have some unhappy faculty members saying, 'Why can't my course be on there?' '' http : // www.nytimes.com Graphic PHOTO: Online classes have been around for years. What is new is how some top colleges now are throwing open the doors digitally. (PHOTOGRAPH BY RAMIN RAHIMIAN FOR THE NEW YORK TIMES) Load-Date: July 18, 2012 End of Document Talking Head The New York Times

Time: 05/04/2013  
Imagine taking a college exam, and, instead of handing in a blue book and getting a grade from a professor a few weeks later, clicking the ''send'' button when you are done and receiving a grade back instantly, your essay scored by a software program. And then, instead of being done with that exam, imagine that the system would immediately let you rewrite the test to try to improve your grade. EdX, the nonprofit enterprise founded by Harvard and the Massachusetts Institute of Technology to offer courses on the Internet, has just introduced such a system and will make its automated software available free on the Web to any institution that wants to use it. The software uses artificial intelligence to grade student essays and short written answers, freeing professors for other tasks. The new service will bring the educational consortium into a growing conflict over the role of automation in education. Although automated grading systems for multiple-choice and true-false tests are now widespread, the use of artificial intelligence technology to grade essay answers has not yet received widespread endorsement by educators and has many critics. Anant Agarwal, an electrical engineer who is president of EdX, predicted that the instant-grading software would be a useful pedagogical tool, enabling students to take tests and write essays over and over and improve the quality of their answers. He said the technology would offer distinct advantages over the traditional classroom system, where students often wait days or weeks for grades. ''There is a huge value in learning with instant feedback,'' Dr. Agarwal said. ''Students are telling us they learn much better with instant feedback.'' But skeptics say the automated system is no match for live teachers. One longtime critic, Les Perelman, has drawn national attention several times for putting together nonsense essays that have fooled software grading programs into giving high marks. He has also been highly critical of studies that purport to show that the software compares well to human graders. ''My first and greatest objection to the research is that they did not have any valid statistical test comparing the software directly to human graders,'' said Mr. Perelman, a retired director of writing and a current researcher at M.I.T. He is among a group of educators who last month began circulating a petition opposing automated assessment software. The group, which calls itself Professionals Against Machine Scoring of Student Essays in High-Stakes Assessment, has collected nearly 2,000 signatures, including some from luminaries like Noam Chomsky. ''Let's face the realities of automatic essay scoring,'' the group's statement reads in part. ''Computers cannot 'read.' They cannot measure the essentials of effective written communication: accuracy, reasoning, adequacy of evidence, good sense, ethical stance, convincing argument, meaningful organization, clarity, and veracity, among others.'' But EdX expects its software to be adopted widely by schools and universities. EdX offers free online classes from Harvard, M.I.T. and the University of California, Berkeley; this fall, it will add classes from Wellesley, Georgetown and the University of Texas. In all, 12 universities participate in EdX, which offers certificates for course completion and has said that it plans to continue to expand next year, including adding international schools. The EdX assessment tool requires human teachers, or graders, to first grade 100 essays or essay questions. The system then uses a variety of machine-learning techniques to train itself to be able to grade any number of essays or answers automatically and almost instantaneously. The software will assign a grade depending on the scoring system created by the teacher, whether it is a letter grade or numerical rank. It will also provide general feedback, like telling a student whether an answer was on topic or not. Dr. Agarwal said he believed that the software was nearing the capability of human grading. ''This is machine learning and there is a long way to go, but it's good enough and the upside is huge,'' he said. ''We found that the quality of the grading is similar to the variation you find from instructor to instructor.'' EdX is not the first to use automated assessment technology, which dates to early mainframe computers in the 1960s. There is now a range of companies offering commercial programs to grade written test answers, and four states -- Louisiana, North Dakota, Utah and West Virginia -- are using some form of the technology in secondary schools. A fifth, Indiana, has experimented with it. In some cases the software is used as a ''second reader,'' to check the reliability of the human graders. But the growing influence of the EdX consortium to set standards is likely to give the technology a boost. On Tuesday, Stanford announced that it would work with EdX to develop a joint educational system that will incorporate the automated assessment technology. Two start-ups, Coursera and Udacity, recently founded by Stanford faculty members to create ''massive open online courses,'' or MOOCs, are also committed to automated assessment systems because of the value of instant feedback. ''It allows students to get immediate feedback on their work, so that learning turns into a game, with students naturally gravitating toward resubmitting the work until they get it right,'' said Daphne Koller, a computer scientist and a founder of Coursera. Last year the Hewlett Foundation, a grant-making organization set up by one of the Hewlett-Packard founders and his wife, sponsored two $100,000 prizes aimed at improving software that grades essays and short answers. More than 150 teams entered each category. A winner of one of the Hewlett contests, Vik Paruchuri, was hired by EdX to help design its assessment software. ''One of our focuses is to help kids learn how to think critically,'' said Victor Vuchic, a program officer at the Hewlett Foundation. ''It's probably impossible to do that with multiple-choice tests. The challenge is that this requires human graders, and so they cost a lot more and they take a lot more time.'' Mark D. Shermis, a professor at the University of Akron in Ohio, supervised the Hewlett Foundation's contest on automated essay scoring and wrote a paper about the experiment. In his view, the technology -- though imperfect -- has a place in educational settings. With increasingly large classes, it is impossible for most teachers to give students meaningful feedback on writing assignments, he said. Plus, he noted, critics of the technology have tended to come from the nation's best universities, where the level of pedagogy is much better than at most schools. ''Often they come from very prestigious institutions where, in fact, they do a much better job of providing feedback than a machine ever could,'' Dr. Shermis said. ''There seems to be a lack of appreciation of what is actually going on in the real world.'' http : // www.nytimes.com/2013/04/05/science/new-test-for-computers-grading-essays-at-college-level.html Graphic PHOTO: Alejandro Ruata, left, and Hans Johnson working on a community college project in Boston using EdX software. (PHOTOGRAPH BY GRETCHEN ERTL FOR THE NEW YORK TIMES) (A11) Load-Date: April 5, 2013 End of Document Paperback Row The New York Times

Time: 04/11/2012  
late September, as workers applied joint compound to new office walls, hoodie-clad colleagues who had just met were working together on deadline. Film editors, code-writing interns and ''edX fellows'' -- grad students and postdocs versed in online education -- were translating videotaped lectures into MOOCs, or massive open online courses. As if anyone needed reminding, a row of aqua Post-its gave the dates the courses would ''go live.'' The paint is barely dry, yet edX, the nonprofit start-up from Harvard and the Massachusetts Institute of Technology, has 370,000 students this fall in its first official courses. That's nothing. Coursera, founded just last January, has reached more than 1.7 million -- growing ''faster than Facebook,'' boasts Andrew Ng, on leave from Stanford to run his for-profit MOOC provider. ''This has caught all of us by surprise,'' says David Stavens, who formed a company called Udacity with Sebastian Thrun and Michael Sokolsky after more than 150,000 signed up for Dr. Thrun's ''Introduction to Artificial Intelligence'' last fall, starting the revolution that has higher education gasping. A year ago, he marvels, ''we were three guys in Sebastian's living room and now we have 40 employees full time.'' ''I like to call this the year of disruption,'' says Anant Agarwal, president of edX, ''and the year is not over yet.'' MOOCs have been around for a few years as collaborative techie learning events, but this is the year everyone wants in. Elite universities are partnering with Coursera at a furious pace. It now offers courses from 33 of the biggest names in postsecondary education, including Princeton, Brown, Columbia and Duke. In September, Google unleashed a MOOC-building online tool, and Stanford unveiled Class2Go with two courses. Nick McKeown is teaching one of them, on computer networking, with Philip Levis (the one with a shock of magenta hair in the introductory video). Dr. McKeown sums up the energy of this grand experiment when he gushes, ''We're both very excited.'' Casually draped over auditorium seats, the professors also acknowledge that they are not exactly sure how this MOOC stuff works. ''We are just going to see how this goes over the next few weeks,'' says Dr. McKeown. WHAT IS A MOOC ANYWAY? Traditional online courses charge tuition, carry credit and limit enrollment to a few dozen to ensure interaction with instructors. The MOOC, on the other hand, is usually free, credit-less and, well, massive. Because anyone with an Internet connection can enroll, faculty can't possibly respond to students individually. So the course design -- how material is presented and the interactivity -- counts for a lot. As do fellow students. Classmates may lean on one another in study groups organized in their towns, in online forums or, the prickly part, for grading work. The evolving form knits together education, entertainment (think gaming) and social networking. Unlike its antecedent, open courseware -- usually written materials or videotapes of lectures that make you feel as if you're spying on a class from the back of the room -- the MOOC is a full course made with you in mind. The medium is still the lecture. Thanks to Khan Academy's free archive of snappy instructional videos, MOOC makers have gotten the memo on the benefit of brevity: 8 to 12 minutes is typical. Then -- this is key -- videos pause perhaps twice for a quiz to make sure you understand the material or, in computer programming, to let you write code. Feedback is electronic. Teaching assistants may monitor discussion boards. There may be homework and a final exam. The MOOC certainly presents challenges. Can learning be scaled up this much? Grading is imperfect, especially for nontechnical subjects. Cheating is a reality. ''We found groups of 20 people in a course submitting identical homework,'' says David Patterson, a professor at the University of California, Berkeley, who teaches software engineering, in a tone of disbelief at such blatant copying; Udacity and edX now offer proctored exams. Some students are also ill prepared for the university-level work. And few stick with it. ''Signing up for a class is a lightweight process,'' says Dr. Ng. It might take just five minutes, assuming you spend two devising a stylish user name. Only 46,000 attempted the first assignment in Dr. Ng's course on machine learning last fall. In the end, he says, 13,000 completed the class and earned a certificate -- from him, not Stanford. That's still a lot of students. The shimmery hope is that free courses can bring the best education in the world to the most remote corners of the planet, help people in their careers, and expand intellectual and personal networks. Three-quarters of those who took Dr. Patterson's ''Software as a Service'' last winter on Coursera (it's now on edX) were from outside the United States, though the opposite was true of a course on circuits and electronics piloted last spring by Dr. Agarwal. But both attracted highly educated students and both reported that over 70 percent had degrees (more than a third had graduate degrees). And in a vote of confidence in the form, students in both overwhelmingly endorsed the quality of the course: 63 percent who completed Dr. Agarwal's course as well as a similar one on campus found the MOOC better; 36 percent found it comparable; 1 percent, worse. Ray Schroeder, director of the Center for Online Learning, Research and Service at the University of Illinois, Springfield, says three things matter most in online learning: quality of material covered, engagement of the teacher and interaction among students. The first doesn't seem to be an issue -- most professors come from elite campuses, and so far most MOOCs are in technical subjects like computer science and math, with straightforward content. But providing instructor connection and feedback, including student interactions, is trickier. ''What's frustrating in a MOOC is the instructor is not as available because there are tens of thousands of others in the class,'' Dr. Schroeder says. How do you make the massive feel intimate? That's what everyone is trying to figure out. Many places offer MOOCs, and more will. But Coursera, Udacity and edX are defining the form as they develop their brands. THE FLAVOR OF THE MOOC Coursera casts itself as a ''hub'' -- Dr. Ng's word -- for learning and networking. The learning comes gratis from an impressive roster of elites offering a wide range of courses, from computer science to philosophy to medicine. Not all are highbrow or technical; ''Listening to World Music'' from the University of Pennsylvania aims to broaden your iPod playlist. While Coursera will make suggestions, Dr. Ng says, ''ultimately all pedagogical decisions are made by the universities.'' Most offerings are adapted from existing courses: a Princeton Coursera course is a Princeton course. But the vibe is decidedly Facebook -- build a profile, upload your photo -- with tools for students to plan ''meet-ups'' with Courserians in about 1,400 cities worldwide. These gatherings may be bona fide study groups or social sessions. Membership may be many or sparse. No one showed at the meet-up that Stacey Brown, an information technology manager at a Hartford insurance company, scheduled for a 14th-floor conference room on a Thursday after work, despite R.S.V.P.'s from a few classmates in the area. He's taking three Coursera MOOCs, including ''Gamification'' from the University of Pennsylvania Wharton School. In addition to the learning -- and dropping to bosses that he's taking a Wharton course -- Mr. Brown says, ''I hope to get a network.'' Others like the discipline a group offers. Kimberly Spillman, a software engineer, started taking seven MOOCs and completed three. ''The ones I have study groups with people, those are the ones I finish,'' Ms. Spillman says. She first joined a group for Dr. Thrun's artificial intelligence course, and then ran one for a Udacity course on building a search engine, organizing Thursday-evening discussions of the week's material followed by a social hour at a nearby pub. Fifteen people met each week at the Ansir Innovation Center, a community space with big tables and comfortable chairs, in the Kearny Mesa neighborhood of San Diego. Udacity has stuck close to its math and computer science roots and emphasizes applied learning, like ''How to Build a Blog'' or ''Building a Web Browser.'' Job placement is part of the Udacity package. ''The type of skills taught in computer science, even at elite universities, can be very theoretical,'' Dr. Stavens explains. Udacity courses are designed and produced in-house or with companies like Google and Microsoft. In a poke at its university-based competition, Dr. Stavens says they pick instructors not because of their academic research, as universities do, but because of how they teach. ''We reject about 98 percent of faculty who want to teach with us,'' he says. ''Just because a person is the world's most famous economist doesn't mean they are the best person to teach the subject.'' Dr. Stavens sees a day when MOOCs will disrupt how faculty are attracted, trained and paid, with the most popular ''compensated like a TV actor or a movie actor.'' He adds that ''students will want to learn from whoever is the best teacher.'' That means you don't need a Ph.D. While there are traditional academics like David Evans of the University of Virginia, ''Landmarks in Physics,'' a first-year college-level course, is taught by Andy Brown, a 2009 M.I.T. graduate with a B.S. in physics. ''We think the future of education is guys like Andy Brown who produce the most fun,'' Dr. Stavens says. Mr. Brown's course is an indie version of ''Bill Nye the Science Guy'' -- filmed in Italy, the Netherlands and England, with opening credits for ''director of photography'' and ''second camera and editor.'' Whether explaining what the ancients believed about the shape of the earth or, in Dr. Thrun's statistics course, why you are unpopular, statistically speaking, voice-overs are as nonthreatening as a grade school teacher. ''You feel like you are sitting next to someone and they are tutoring you,'' says Jacqueline Spiegel, a mother of three from New Rochelle, N.Y., with a master's in computer science from Columbia who has enrolled in MOOCs from Udacity and Coursera. While taking ''Artificial Intelligence,'' she discovered she liked puzzling through assignments in online study groups. The class was tough and took ''an embarrassing amount of time,'' says Ms. Spiegel, who found that consuming lectures by smartphone during her 14-year-old's 6 a.m. ice skating sessions worked less well than being parked at a desktop. ''I would listen to the lectures, then I would listen to them again.'' Her effort was huge -- some 22 hours a week -- but rewarding. Ms. Spiegel befriended women in India and Pakistan through Facebook study groups and started an online group, CompScisters, for women taking science and technology MOOCs. If Udacity favors stylish hands-on instruction, edX aims to be elite, smart and rigorous; don't expect a gloss of calculus if you need it but never took it. Some 120 institutions have been in touch; only Berkeley and the University of Texas system have been admitted to the club. EdX's M.I.T. roots show in its staff's geeky passion for building and testing online tools. They collect your clicks. Feedback from the MOOC taught last spring by Dr. Agarwal (who, students learn, is obsessed with chain saws) revealed that participants would rather watch a hand writing an equation or sentence on paper than stare at the same paper with writing already on it. The focus is on making education logical. ''Someone who is consuming the course should know it is not serendipity that the course is chunked in a certain way, but that there is intentionality to sequencing video,'' says Howard A. Lurie, vice president for content development. With mini-notebook in hand, he has been leading the ''daily stand-up'' meeting (so called because attendees lean against walls) to keep course development on schedule. After one meeting, Lyla Fischer, a 2011 M.I.T. graduate and edX fellow, sat at her computer, a tag still dangling from the chair, and edited the answers for problem sets in Dr. Agarwal's course. Last spring, students could download PDFs with brief answers. Now, she says, ''there is a full explanation of how to do it, here are the steps,'' right on the site. ''We are trying to use the magic of all the tool sets we have,'' Mr. Lurie says. Students control how fast they watch lectures. Some like to go at nearly double the speed; others want to slow down and replay. Coming: If you get a wrong answer, the software figures out where you went wrong and offers a correction. WORKING OUT THE KINKS Assignments that can't be scored by an automated grader are pushing MOOC providers to get creative, especially in courses that involve writing and analysis. Coursera uses peer grading: submit an assignment and five people grade it; in turn, you grade five assignments. But what if someone is a horrible grader? Coursera is developing software that will flag those who assign very inaccurate grades and give their assessment less weight. Mitchell Duneier, a Princeton professor, is conducting a study that compares peer grading of the final exam in his sociology MOOC on Coursera last summer with the grades he and his course assistants would have given the students. Mr. Brown, the Hartford I.T. manager, does not have confidence in peer feedback. ''This could be a 14-year-old kid in South Africa answering me,'' he says, thinking of his 14-year-old. The challenge is not just in grading. The diversity of MOOC takers -- teenagers to retirees, and from across the globe -- means classmates lack a common knowledge base and educational background. Out-of-their-league students, especially in highly technical courses, can drag down discussions. Which course is right for you? What prerequisites are really needed to perform well? Princeton's ''Networks: Friends, Money and Bytes'' on Coursera recommends basic linear algebra and multivariable calculus but the ''instructor will see if part of the course material can be presented without requiring this mathematical background.'' ''Introduction to Computer Science'' from Harvard lists prerequisites as ''none'' -- as long as you're Harvard-ready. Where are the Yelp reviews? ''We desperately need crowdsourcing,'' says Cathy N. Davidson, a Duke professor of English and interdisciplinary studies. ''We need a MOOCE -- massive open online course evaluation.'' Most important, what do you get for your effort? Do you earn a certificate? A job interview? Or just the happy feeling of learning something? ''If one is going for the knowledge, it's a boon,'' says Dr. Schroeder of the University of Illinois. ''If one is looking for credit, that is one of the challenges. How do we fit this into the structure of higher education today?'' Dr. Agarwal predicts that ''a year from now, campuses will give credit for people with edX certificates.'' He expects students will one day arrive on campus with MOOC credits the way they do now with Advanced Placement. The line between online and on campus is already blurring. This spring Dr. Davidson will teach a class called ''Surprise Endings: Social Science and Literature'' at Duke and as a MOOC, with her Duke students running the online discussions. This fall, San Jose State students are taking Dr. Agarwal's course on circuits and electronics, with professors and teaching assistants on campus leading discussions. They add their own content, including exams. In the spring, Massachusetts Bay Community College in Wellesley will use an edX MOOC in introductory computer science. Dr. Stavens promises more change, and more disruption: ''We are only 5 to 10 percent of the way there.'' Graphic PHOTOS: Clockwise from top left: circuits and electronics with Anant Agarwal, M.I.T. (edX) statistics with Sebastian Thrun (Udacity) organic chemistry with Jeffrey S. Moore, University of Illinois, Urbana (Coursera) machine learning with Andrew Ng, Stanford (Coursera). (ED26) Opening credits for Udacity's ''Landmarks in Physics.'' (ED28) Load-Date: November 20, 2012 End of Document Innovation, Optimism and Jobs The New York Times

Time: 16/08/2011  
Calif. -- A free online course at Stanford University on artificial intelligence, to be taught this fall by two leading experts from Silicon Valley, has attracted more than 58,000 students around the globe -- a class nearly four times the size of Stanford's entire student body. The course is one of three being offered experimentally by the Stanford computer science department to extend technology knowledge and skills beyond this elite campus to the entire world, the university is announcing on Tuesday. The online students will not get Stanford grades or credit, but they will be ranked in comparison to the work of other online students and will receive a ''statement of accomplishment.'' For the artificial intelligence course, students may need some higher math, like linear algebra and probability theory, but there are no restrictions to online participation. So far, the age range is from high school to retirees, and the course has attracted interest from more than 175 countries. The instructors are Sebastian Thrun and Peter Norvig, two of the world's best-known artificial intelligence experts. In 2005 Dr. Thrun led a team of Stanford students and professors in building a robotic car that won a Pentagon-sponsored challenge by driving 132 miles over unpaved roads in a California desert. More recently he has led a secret Google project to develop autonomous vehicles that have driven more than 100,000 miles on California public roads. Dr. Norvig is a former NASA scientist who is now Google's director of research and the author of a leading textbook on artificial intelligence. The computer scientists said they were uncertain about why the A.I. class had drawn such a large audience. Dr. Thrun said he had tried to advertise the course this summer by distributing notices at an academic conference in Spain, but had gotten only 80 registrants. Then, several weeks ago he e-mailed an announcement to Carol Hamilton, the executive director of the Association for the Advancement of Artificial Intelligence. She forwarded the e-mail widely, and the announcement spread virally. The two scientists said they had been inspired by the recent work of Salman Khan, an M.I.T.-educated electrical engineer who in 2006 established a nonprofit organization to provide video tutorials to students around the world on a variety of subjects via YouTube. ''The vision is: change the world by bringing education to places that can't be reached today,'' said Dr. Thrun. The rapid increase in the availability of high-bandwidth Internet service, coupled with a wide array of interactive software, has touched off a new wave of experimentation in education. For example, the Khan Academy, which focuses on high school and middle school, intentionally turns the relationship of the classroom and homework upside down. Students watch lectures at home, then work on problem sets in class, where the teacher can assist them one on one. The Stanford scientists said they were focused on going beyond early Internet education efforts, which frequently involved uploading online videos of lectures given by professors and did little to motivate students to do the coursework required to master subjects. The three online courses, which will employ both streaming Internet video and interactive technologies for quizzes and grading, have in the past been taught to smaller groups of Stanford students in campus lecture halls. Last year, for example, Introduction to Artificial Intelligence drew 177 students. The two additional courses will be an introductory course on database software, taught by Jennifer Widom, chairwoman of the computer science department, and an introduction to machine learning, taught by Andrew Ng. Dr. Widom said she had recorded her video lectures during the summer and would use classroom sessions to work with smaller groups of students on projects that might be competitive and to bring in people from the industry to give special lectures. Unlike the A.I. course, this one will compare online students with one another and not with the Stanford students. How will the artificial intelligence instructors grade 58,000 students? The scientists said they would make extensive use of technology. ''We have a system running on the Amazon cloud, so we think it will hold up,'' Dr. Norvig said. In place of office hours, they will use the Google moderator service, software that will allow students to vote on the best questions for the professors to respond to in an online chat and possibly video format. They are considering ways to personalize the exams to minimize cheating. Part of the instructional software was developed by Know Labs, a company Dr. Thrun helped start. Although the three courses are described as an experiment, the researchers say they expect university classes to be made more widely accessible via the Internet. ''I personally would like to see the equivalent of a Stanford computer science degree on the Web,'' Dr. Ng said. Dr. Widom said that having Stanford courses freely available could both assist and compete with other colleges and universities. A small college might not have the faculty members to offer a particular course, but could supplement its offerings with the Stanford lectures. There has also been some discussion at Stanford about whether making the courses freely available would prove to be a threat to the university, which charges high fees for tuition. Dr. Thrun dismissed that idea. ''I'm much more interested in bringing Stanford to the world,'' he said. ''I see the developing world having colossal educational needs.'' Hal Abelson, a computer scientist at M.I.T. who helped develop an earlier generation of educational offerings that began in 2002, said the Stanford course showed how rapidly the online world was evolving. ''The idea that you could put up open content at all was risky 10 years ago, and we decided to be very conservative,'' he said. ''Now the question is how do you move into something that is more interactive and collaborative, and we will see lots and lots of models over the next four or five years.'' http : // www.nytimes.com Graphic PHOTO: The instructors, Peter Norvig, left, of Google, and Sebastian Thrun of Stanford University. (PHOTOGRAPH BY NOAH BERGER FOR THE NEW YORK TIMES) Load-Date: August 16, 2011 End of Document Saul Amarel, 74, an Innovator In the Artificial Intelligence Field The New York Times

Time: 03/05/2012  
In what is shaping up as an academic Battle of the Titans -- one that offers vast new learning opportunities for students around the world -- Harvard and the Massachusetts Institute of Technology on Wednesday announced a new nonprofit partnership, known as edX, to offer free online courses from both universities. Harvard's involvement follows M.I.T.'s announcement in December that it was starting an open online learning project, MITx. Its first course, Circuits and Electronics, began in March, enrolling about 120,000 students, some 10,000 of whom made it through the recent midterm exam. Those who complete the course will get a certificate of mastery and a grade, but no official credit. Similarly, edX courses will offer a certificate but not credit. But Harvard and M.I.T. have a rival -- they are not the only elite universities planning to offer free massively open online courses, or MOOCs, as they are known. This month, Stanford, Princeton, the University of Pennsylvania and the University of Michigan announced their partnership with a new commercial company, Coursera, with $16 million in venture capital. Meanwhile, Sebastian Thrun, the Stanford professor who made headlines last fall when 160,000 students signed up for his Artificial Intelligence course, has attracted more than 200,000 students to the six courses offered at his new company, Udacity. The technology for online education, with video lesson segments, embedded quizzes, immediate feedback and student-paced learning, is evolving so quickly that those in the new ventures say the offerings are still experimental. ''My guess is that what we end up doing five years from now will look very different from what we do now,'' said Provost Alan M. Garber of Harvard, who will be in charge of the university's involvement. EdX, which is expected to offer its first five courses this fall, will be overseen by a nonprofit organization governed equally by the two universities, each of which has committed $30 million to the project. The first president of edX will be Anant Agarwal, director of M.I.T.'s Computer Science and Artificial Intelligence Laboratory, who has led the development of the MITx platform. At Harvard, Dr. Garber will direct the effort, with Michael D. Smith, dean of the faculty of arts and sciences, working with faculty members to develop and deliver courses. Eventually, they said, other universities will join them in offering courses on the platform. M.I.T. and Harvard officials said they would use the new online platform not just to build a global community of online learners, but also to research teaching methods and technologies. Education experts say that while the new online classes offer opportunities for students and researchers, they pose some threat to low-ranked colleges. ''Projects like this can impact lives around the world, for the next billion students from China and India,'' said George Siemens, a MOOC pioneer who teaches at Athabasca University, a publicly supported online Canadian university. ''But if I were president of a mid-tier university, I would be looking over my shoulder very nervously right now, because if a leading university offers a free circuits course, it becomes a real question whether other universities need to develop a circuits course.'' The edX project will include not only engineering courses, in which computer grading is relatively simple, but also humanities courses, in which essays might be graded through crowd-sourcing, or assessed with natural-language software. Coursera will also offer free humanities courses in which grading will be done by peers. In some ways, the new partnerships reprise the failed online education ventures of a decade ago. Columbia University introduced Fathom, a 2001 commercial venture that involved the University of Chicago, the University of Michigan and others. It lost money and folded in 2003. Yale, Princeton and Stanford collaborated on AllLearn, a nonprofit effort that collapsed in 2006. Many education experts are more hopeful about the new enterprises. ''Online education is here to stay, and it's only going to get better,'' said Lawrence S. Bacow, a past president of Tufts who is a member of the Harvard Corporation. Dr. Bacow, co-author of a new report on online learning, said it remained unclear how traditional universities would integrate the new technologies. ''What faculty don't want to do is just take something off the shelf that's somebody else's and teach it, any more than they would take a textbook, start on Page 1, and end with the last chapter,'' he said. ''What's still missing is an online platform that gives faculty the capacity to customize the content of their own highly interactive courses.'' http : // www.nytimes.com Load-Date: May 3, 2012 End of Document Google Expands The New York Times

Time: 17/09/2014  
 called qubits -- and has circuits which exist in all possible states at the same time -- a one, a zero and everything in between. This ability to exist in various states greatly increases the processing power of quantum machines. While the science behind quantum computing seems very technical, broken down in the simplest terms it amounts to a computer which could operate at breakneck speed in comparison to a traditional computer that uses a binary system, and would be especially useful for solving what are known as "optimization problems" -- finding the best solution among huge numbers of possible options. Read: How to make $8 million on Kickstarter Currently, the world's fastest computer belongs to China, the Tianhe-2 supercomputer, which can carry out about 34 quadrillion calculations per second. Experts say a quantum computer would ultimately far surpass this speed. Google's Quantum Artificial Intelligence team has been working with scientists from Canadian company D-Wave Systems, which owns what has been called the first commercially viable quantum computer. Some experts have cast doubt on whether D-Wave's computers are any faster than regular machines, but while D-Wave's CEO Vern Brownell concedes that it's early days for this technology, he sees a bright future. "We're at that stage of the very first days of microprocessors, when Paul Allen and Bill Gates built the first software for those," said Brownell. A mature technology could have huge benefits in a variety of fields. The increased computing power could one day help run complex simulations, such as modeling climate change and helping to develop new drugs. "It's not going to replace classical computing, but certain problem types fit quantum computing very well," said Brownell. Financial revolution? Financial services will be the first industry to feel the benefits, said Brownell. For example, there's currently a huge workload on Wall Street trying to optimize portfolios and dealing with risk management. "Ultimately, quantum computing will do that better," said Brownell, who served as chief technology officer for Goldman Sachs from 1989-2000. Other areas of finance which could benefit include structured asset-backed security pricing, mapping market correlations, capital project budgeting, and developing trading strategies, said D-Wave. Read: Eye-popping street art ... and how it broke free of the banks D-Wave said it is also interested in expanding the cloud capabilities of quantum computing. Potential customers could include anyone with a complicated optimization problem to solve -- from sectors ranging from transportation and logistics to financial services and healthcare. Another broad area for quantum computing is machine learning. Using artificial intelligence to train algorithms, trying to mine big data, and also helping with fraud detection all fall under the quantum computer's domain. Currently, Lockheed Martin uses D-Wave's machine to help verify flight control systems. Another partner of D-Wave is a company called 1QBit, which is building financial algorithms with quantum computing and "making good progress," said Brownell. Obstacles in the way One of the biggest challenges so far for the mighty quantum machine has been environmental interference. The machine can only operate at an incredibly low temperature -- just above absolute zero, or -273.15 degrees. "This chip has to have exactly the right temperature, it has to be shielded," said Brownell. "So a big part of it is building that rarefied environment. A huge amount of research and billions of dollars are being poured into building it." Maintaining the perfect environment is just one of the problems facing quantum computing. "We're really just beginning to understand how we might make a full-scale quantum machine," cautions Dr Peter J Bentley, of the department of computer science at University College London. "There is a vast number of challenges remaining." Bentley believes it could be many years before we see quantum computing come into its own. "Compared to the speed we moved from valves to transistors to integrated silicon chips, progress on quantum computers has been very slow," wrote Bentley, in an email. "It's a much harder problem using mind-bending physics that we don't fully understand. So it may take a few billions of dollars from Google and a few decades before we really see quantum computers." But Google's confidence in creating super-fast quantum computing is palpable. Brownell sees the challenge as a positive for not just Google, but for all of us. "It (quantum computing) will be another tool to help solve very challenging, very hard problems," he said. Read: How to make $8 million on Kickstarter Read: Eye-popping street art ... and how it broke free of the banks Load-Date: October 4, 2014 End of Document Facebook screens posts for suicide risk, and health experts have concerns CNN.com

Time: 29/11/2012  
" SPAUN could fill in the blank as 444. "That's actually part of an intelligence test, realizing that everything is increasing by one," Eliasmith said. "Monkeys actually won't figure that out." A drawback is that SPAUN cannot operate in real time. For every one second in an online demonstration video, it takes 2.5 hours. The researchers are hoping to be able to get it to do real-time operations. And SPAUN, as a simulation of actual neurons, is not a robot. But structuring the artificially intelligent brain like a human brain means that the kinds of errors it makes are the kind of that people make, and its reaction time - how long it takes to "think" about problems - would be similar to humans. This could help with the creation of robots. "All of that kind of thing will make for the possibility of having agents that are more human-like to interact with," Eliasmith said. Christian Machens, neuroscientist at the Champalimaud Neuroscience Programme in Lisbon, Portugal, points out in an accompanying piece in Science that SPAUN is not able to learn any new tasks. Its knowledge is entirely hard-wired. Still, Machens writes that the authors offer a "coherent theory" of the workings of the brain (except for learning). And it sets a new goal for simulations: "to not simply incorporate the largest number of neurons or the greatest amount of detail, but to reproduce the largest amount of functionality and behavior." This research is also useful for modeling brain damage, Eliasmith said. In separate research, he and colleagues looked at what happens when neurons in a simulation get destroyed at the same rate as in humans as they age. "We can show that the performance on (an) intelligence task mimics the kind of performance that you see in people; it gets worse in the same sort of proportion that you find in humans," he said. As for whether we'll have a fully cognizant, self-aware artificial intelligence in our lifetimes, Eliasmith isn't sure, but that is the sort of goal that he and his team are working toward. And they've come up with a novel way of approaching the problem. "It's hard to know at this point whether this approach is going to hit some wall that we haven't seen yet, or actually be able to reach that holy grail, as it were, of artificial intelligence." Load-Date: November 30, 2012 End of Document ADVISORY CNN Wire Outlook CNN Wire

Time: 22/02/2013  
 the big challenge is when it happens unexpectedly," said Erez Rubinstein, a partner at If I Die. The Israeli site launched in 2011 and already has 200,000 users. Most have opted to leave sentimental goodbyes, and written messages are more common than videos, according the company. So far, the service is entirely free, but it plans to launch premium paid options in the future. "It's an era where most of your life and most of your presence is digital, and you want to have some control over it. You want to be in charge of how you are perceived afterward," Rubinstein said. A tweet-bot to remember you by A more extreme version of this type of control lies at the heart of \_LivesOn, a new project with the catchy tag line "When your heart stops beating, you'll keep tweeting." Still in the early stages, \_LivesOn is a Twitter tool in development at Lean Mean Fighting Machine, an advertising agency in the United Kingdom. The agency is partnering with the Queen Mary University to create Twitter accounts that post in the voice of a specific person, even after he or she has died. When people sign up, the service will monitor their Twitter habits and patterns to learn what types of content they like and, in the future, possibly even learn to mimic their syntax. The tool will collect data and start populating a shadow Twitter account with a daily tweet that the algorithm determines match the person's habits and interests. They can help train it with feedback and by favoriting tweets. "It's meant to be like a twin," said Dave Bedwood, a partner at Lean Mean Fighting Machine. In the short term, Bedwood and his team said it will serve as a nice content-recommendation engine. But eventually, in the more distant future, the goal is to have Twitter accounts that can carry on tweeting in the style and voice of the original account. The people behind the project warn against expecting Twitter feeds fully powered by artificial intelligence, or worrying about Skynet, any time soon. "People seem to think there's a button you can press, and we're going to raise all these people from the dead," joked Bedwood, who has seen a huge spike in interest in the project over the past week. "People have a real faith in what technology can do." Artificial Intelligence is still a long way from being able to simulate a specific individual, but recreating the limited slice of personality reflected in a Twitter feed is an interesting place to start. The \_LivesOn service is hoping to roll out to a limited number of test users at the end of March. As with the other services, \_LivesOn will require that members choose an executor. At this point, it's as much a thought experiment as an attempt to create a usable tool. A little bit of immortality All these companies see the potential for technology to change how people think about death. Goodbye messages can help people left behind through the grieving process, but composing them can also be comforting to people who are uncomfortable with or afraid of death. "We shy away from death. It reaches us before we approach it," DeadSocial's Norris said. "We're using tech to soften the impact that death has and dehumanize it. It allows us to think about death in a more logical way and detach ourselves from it." The prospect of artificial intelligence, even in 140-character bursts, can also be comforting to people who see it as a way to live on. "The afterlife is not a new idea, it's been around for quite a long time with all the different versions of heaven and hell," Lean Mean Fighting Machine's Bedwood said. "To me this isn't any stranger than any one of those. In fact, it might be less strange." Load-Date: February 23, 2013 End of Document Ban the killer robots before it's too late CNN Wire

Time: 24/10/2014  
 Smiling children are using prosthetic hands to open windows through which we can glimpse the future of health care -- a future where outsiders and amateurs innovate along with insiders and professionals. The question is, "Will America lead the way, as it has for a century, or will it fall behind, as it has begun to do?" My forthcoming Mercatus Center research "Fortress and Frontier in American Health Care" argues that leading requires us to abandon the partisan rancor over health insurance ("Obamacare" vs. "repeal and replace") and focus, instead, on innovating our way to better health. FDA-approved prosthetic hands cost around $40,000. Several years ago, a South African carpenter lost some fingers in an accident and collaborated with a Washington state puppetmaker to invent a vastly more affordable device. They adapted a 19th-century metal-and-whalebone design for a 21st-century 3-D printer to produce a hand that allows users to drive, ride bikes, play ball, grasp objects and feel normal and complete. Printed hands require only a few hours of assembly time, and materials (essentially a special glue, string and screws) cost between $10 and $50 -- 1/1000 the cost of professional models. The proliferation of printed hands began when Jon Schull at the Rochester Institute of Technology formed e-NABLE, a global, Web-based social network, to connect people who need hands with people who are interested in building them. Amateurs quickly began modifying the hands. One added an extra thumb so his son could grasp objects more easily. A student designed a hand that rotates at the wrist just as natural hands can but which $40,000 prosthetics can't. Children designed hands that mimic those of comic-book superheroes-- earning the envy of classmates. Professional prosthetics are much more elaborate, but at $40,000 a pop, they aren't practical for growing children. A fashion designer created stunningly beautiful hands for a fellow student. 3-D Printed hands are evolving at breathtaking speed because of what my Mercatus colleague Adam Thierer calls "permissionless innovation." No one has to beg permission from anyone to design, modify or distribute hands. That wouldn't be true if the hands included sensors and/or motors or if they were sold, rather than given away. Regulators would likely swoop in, and innovation would slow. Permissionless innovation is largely alien to health care. New drugs, devices and procedures typically wait for years as regulators sort through stacks of proposals and tons of data. The film "Dallas Buyers Club" is based on the true story of an AIDS victim, 30 days from death, who was denied lifesaving treatment because the Food and Drug Administration wanted extra years of testing to assure safety and effectiveness. The greatest example of permissionless innovation is the Internet. In the early 1990s, the federal government surrendered control over the Internet and enabled commercial developers to make full use of the system. Once that happened, professionals and amateurs produced software, hardware and apps in ways and at speeds no one could have foreseen. An American of 25 years ago could scarcely believe our world of Google, Siri, GPS, YouTube, Street View, Facebook, Amazon, Bitcoin and Kindle. None of this would have happened had there been a Federal Internet Commission judging each innovation. If you think, "but health care is different," keep in mind that it would have been equally easy in 1989 to demand heavy regulation of a frightening new communication technology. The Internet raises risks of online fraud, sexual predators, coordinated terrorism, identity theft and privacy violations. If such things as OnStar, GM's safety and connectivity system, or hospital connectivity fails, people can die. Somehow, we decided to accept these risks to enjoy the benefits. Health care may change as much by 2039 as consumer electronics did since 1989. We'll likely see 3-D printed transplantable organs, drugs tailor-made to patients' personal DNA, nanobots to repair damaged genes and artificial intelligence to guide people toward wellness. Excessive regulation, however, can bring these processes to a crawl. Adam Thierer says, "Trying to preemptively plan for every hypothetical worst-case scenario means the best-case scenarios will never come about." The innovations will happen in Europe, India, Singapore and elsewhere if not here. And to compete, we have to accept some risks and open the door to some outside innovators. No one suggests completely deregulated health care. The question is one of degree and design. Already, Europe surpasses the United States in drug availability, thanks to its more decentralized approval process. We can suggest an Iron Law of Innovation: For better products at lower cost, you must allow reasonable risk-taking (by consumers and producers), and you must allow unknown outsiders to introduce unexpected genius into the process. The printed hand shows us how. The task is to apply its lessons across health care. Talking about innovation will be a lot more fun and incredibly more productive than squabbling over Obamacare. TM & © 2014 Cable News Network, Inc., a Time Warner Company. All rights reserved. Load-Date: October 25, 2014 End of Document Elon Musk warns against unleashing artificial intelligence 'demon' CNN Wire

Time: 06/12/2005  
 his goal is to create products that people can buy and use. For instance, he designed and brought to market the SturdyGrip pole -- a movable handgrip that makes it easy for people to get out of chairs and beds. A product called Staxi -- a stackable transport chair -- enables people to get around in hospitals without having to wait for a volunteer. Redoing the bathroom Then there's the bathroom. "If you can't manage in the bathroom safely, you're not going to be able to live independently," Fernie says. And toilets, Fernie says, are a complete refutation of the notion of intelligent design. "Toilets are not intelligently designed," he says. "They evolved out of holes in the ground and they haven't gotten very far since." For many people -- the old and frail or simply those with a disability -- the standard toilet is just too low to use comfortably. Enter Toilevator, an easy-to-install plastic block that raises the toilet height. In many ways, Toilevator is the epitome of a good gadget -- it's simple, easy to use, and makes a difference in the way people live. "I love technology," Fernie said. He likes simple technology and he likes complicated technology. But most of all, he loves technology that works. A 'transformative' experience His first experience with bioengineering came as an undergrad in his native England. His tutor at the University of Sussex arranged for him to spend one summer as a research assistant at a home for disabled children. It was several years after thalidomide, and many of the children had no functioning upper limbs, so Fernie was asked to help a scientist who was trying to develop powered prosthetic arms. The subject was a natural for the glossy magazines and the national newspapers, Fernie said, "but when the reporters left, the kids took the arms off and combed their hair with their toes -- the technology was just too crude." While the project failed, the experience was "transformative," he said: "Obviously we had to solve this kind of problem." And that's what Fernie has been doing ever since. Since he finished his bioengineering doctorate in 1973, he has been in Toronto, first trying to improve computer-aided prosthesis design and fitting for amputees, and later directing the Centre for Aging, which he started at Sunnybrook &Women's Health Sciences Center. The iDAPT concept Now, he's trying to take his work to another level at the Toronto Rehabilitation Institute. "We're going to build easily the most sophisticated and exciting place (to do rehabilitation science) anywhere in the world," Fernie says. It's dubbed iDAPT -- a play on "adapt" with the lower-case 'i' intended to be a catchy marketing tool -- and when it's finished in 2010, the $35-million facility will be perhaps the most elaborate facility dedicated to rehabilitation in the world. It will house design studios, prototyping equipment, test beds capable of duplicating a winter storm, an icy street, or a torrid summer day, as well as the usual range of bioengineering research labs. The goal is to be able to attack any barrier that stops people from living a full life, Fernie said. "As we rescue more and more people (with the increasing resources of acute medicine)," he says, "we have to find ways to make sure their lives are worth living." One of Fernie's basic research interests for many years has been why old people tend to fall more often -- often with life-threatening consequences With colleague Brian Maki, he found that it's not really that old people fall more often. Instead, they are just less able to save themselves by taking that quick step or reaching out grab something. How to apply that insight isn't clear yet, but he and colleagues are working on different kinds of handrails, canes, and walkers. Perhaps differently colored handrails might help, or rails high enough to be grasped under the arm -- again a matter for more study. Wheelchairs are another target for Fernie and his colleagues. "They work great is hospitals," he says, but at home -- with narrow doors and sharp turns -- or on city streets, they're less useful. In 2001, the FDA approved one of Fernie's gadgets -- a powered wheelchair that can move in any direction. The extra mobility of the chair is a step forward, and now he and colleagues are trying to extend its use. For instance, in nursing homes, most patients can't use a normal wheelchair because they're not strong enough and they aren't permitted powered chairs for fear they'll lose control and injure someone. With colleague Alex Mihailidis, Fernie is developing a powered wheelchair that will sense an obstacle and stop automatically. Then it will sense where there's open space and suggest -- in a robot voice -- moving in that direction. Off-the-wall idea Workers in Mihailidis's lab are also working on another bathroom project -- an artificial intelligence agent that will help people with hand-washing. "People with Alzheimer's have a lot of trouble with hand-washing," Fernie said. "They don't know to turn the tap on, they don't know to put soap on, they don't know to rinse." The solution now is to have a caregiver monitor that activity, but Fernie hopes that a combination of artificial intelligence and sink-mounted cameras will take some of the load off. "People said it would be a disaster, but it wasn't -- it worked," he said. "People with dementia respond quite well to commands that are coming from the walls." Load-Date: December 7, 2005 End of Document Scientists: Humans and machines will merge in future CNN.com

Time: 23/12/2005  
 whether it's Amazon, Ebay, Google or Yahoo -- are all search driven. The two largest customers of Google, in term of buying the advertising that you see on the side of the page or the top, are Ebay and Amazon, because you go online looking to buy something, right? Twenty five percent of the time people are looking for a commercial transaction when they go online. And it's extremely important to those businesses that they are found. And the way you are found is to list well in the result to the search. Search is becoming a navigational interface. The way we use to navigate this vast knowledge, space that exists out there is much larger than anything we could jump up on the computer. This is the computer connected to the rest of the world. We need to find a way to understand how to make a sense of all that, and searches become our way. CNN: Google isn't the only search business, but its name is synonymous with search. How has it done this? JB: It's certainly not the only one. There were these companies, apart from Google, that were doing the same thing essentially. But the timing wasn't right, the technology wasn't right. The moment Google broke out, there were a number of things that happened. One of them was the bubble actually blew up -- pieces were all over the ground. But the public, the audience, us, we didn't stop using the Internet. People stopped making [it] on the Internet, lot of people lost a lot of money in the stock market, but the rest of us kept using the Internet. The portals, the Yahoos, were not worried about search, they were worried about holding you on their sites. They didn't want you to find something and go over to it. They want you to stay in one place and watch their ads. It turned out that their ads had very little to do with what you might be interested in. Google's model, which is how they broke out, was that when you put your intention into that box, it would reorganize the page around your intention. If you put the word "minivan" in there, the page would reorganize the advertisements with regards to minivans. Whether there's cars or whatever would be right next to the results about minivans that Google served up. This was a very efficient and productive way of organizing and advertising in Google, who have made $6 billion in revenue this year. CNN: Is the Google success story based on good fortune or good technology? JB: A mixture of both. They were definitely the best at their jobs at the time. It's arguable whether they are now. But the fact is that they've got a brand, which is an absolute world beater. People are so devoted to Google because they had that moment when someone would tell them about it, usually a friend, and they went there and they put in something they were looking for -- and they found it. Or they didn't know what they were looking for but they had a vague idea. And the idea that you can use natural language, conversational words to navigate your way around something was completely new in the late 1990s and early into the new century. It was a new way of discovering things and at that moment we had tens of millions of new people coming on to the Internet and saying, "What's out here?" They were using search to find something, and Google was the answer. They paid attention to the right thing at the right time, and they had great technology. CNN: The founders of Google, Larry Page and Sergey Brin, were undoubtedly tech-savvy, but were they also business-minded or did they have to become business minded to make their idea work? JB: I think they were business-minded, but I don't think that they are typical businessmen. We've got to remember these were two extremely bright graduate students in computer science and mathematics at Stanford University, one of the lead universities in the United States. So we are not talking about people who had dreams of being great businessmen. On the other hand, they chose Stanford for a reason. Stanford is the place that [produces] some of the greatest names in the technology business. And this is why in the mid-'90s when they came, they had every knowledge that Internet companies would literally be coming out of Stanford every six months, and being funded and going on to glory, so they knew this was happening. But they are not business people. They made quite a few statements saying they are actually very anti-corporate. They pride themselves on doing things differently, and it turns out they were right and the way they did things and the things they paid attention to were extremely profitable and have made incredible business. The big test for them really has not happened yet. Getting from where they started to where they are now, they are in front of a very big wave with just the right product, and just the right business model. Where they have to go now is a territory that would require extraordinary business acumen, because they are competing with Bill Gates now, they are competing with Yahoo, they are competing with News Corp. They are in a world where they are going to have to cooperate and partner with world governments. This is not, "Let's build a better mousetrap and watch it take off." This is a case of, "We've got a $6 billion business -- we are trying to get it to be a $60 billion business. And we have to elbow a lot of other people without getting them so upset." This is a different test. And whether or not these two founders are up to it is an open question. CNN: What would others have to do to be the next Google? JB: First, you have to create an innovation that makes people say, "I've got to use this, this is better than that." That is extremely hard. Search is one of the hardest computer science problems in the world, because basically we are trying to create artificial intelligence so that we can speak with our computer, they can understand us and deliver what we are looking for. That is equivalent to turning your computer into a very intelligent research librarian, which of course is the holy grail of computer science, to create artificial intelligence. So it's not easy, you know. And to make a leap beyond Google and create a better mousetrap requires computer science that hasn't been invented yet. Secondly, you have to do search well. It's pretty easy to do it on a limited scale based on the technology we currently have. But if you want to do that as well as Google, you have to have hundreds of thousands of machines, and you have to have thousands of engineers and keeping that up in running in real time is very expensive. You can't just start a search engine and all of a sudden everyone goes to it, because what would happen is the computers you are running off would blow up. You have to have a scale infrastructure, which is quite expensive so there is that as well that gets in the way. The third thing is funding the next big thing. CNN: What is the next big thing on the Web? JB: The idea to create a semantic Web where everything is described not by one researcher and his team but rather by all of us as we root about the Web. I might say, "This is a picture of a seaside with a sunset," but someone else comes and says, "No this is a picture of a beach in Thailand," and another person comes along and says, "This is a picture of a place I like to go diving." And over time, this one object, and every object in the world gets thusly tagged, gets enough intelligence around it that it can be found no matter how you might ask for it, the brittleness problem is solved. The idea is that we might get to the point where everything in the world of value is in the index correctly, is on the Internet and some way represented, whether it's your car, your child or whether it's a media object like a page or an audio file or whatever, or in this case a picture. And then you create these vast semantic attachments to everything and that becomes the seedbed for the next generation of search to crawl and make sense of. That's a long way off but we are starting to see any number of applications that are making this possible right now where people are starting to tag things and create engines based on those taggings and we are just seeing the beginnings of it. Whether it will be the next great breakthrough in search remains to be seen but it is a promising development. CNN: People are getting nervous because, what you're looking for can be monitored. Do you think people are viewing it with a degree of suspicion? JB: I think this is quite possibly the largest roadblock both to Google and anyone else involved in this space, which is that if it can be known, it more likely will be known. What we know now is everything that we do can be known, every footstep that we take on the Internet, using a search engine or once we've used a search engine and where we've gone -- wherever we've gone and whatever we do there -- can be recorded and it can be recorded by one central recorder. This is in the case of some of the tools now that Google and others give you, called the tool bar, which watches everywhere you go. And why they do that is that so they know everywhere you've been on the Internet so they can give you better search. "Oh, I see, he's been to this site before, so perhaps I should make that site higher in the results." That's called personalized search. It seems like a service to you, right? But all the information about where you've been doesn't live with you, nor do you control it nor can you control who has access to it because of course the government or Google itself -- or it doesn't necessarily have to be Google, it could be Microsoft or Yahoo or anyone else -- could do whatever they like with it without telling you. In fact, it's part of their privacy policy that they will not sell this, they will not give it to third parties unless the laws of that country require them to. Now we've seen the laws of various countries and the law of China is very different from the law of Britain and very different from the law of the United States. In fact, the law of the United States is a lot more like China. It turns out that after 9/11 we've passed a law called the Patriot Act which gives the government right to riffle through all of our stuff on line without our knowledge, which frankly as a journalist terrifies me. Not that I don't think we should have tools to combat terrorism -- I do. I just think we need a little sunlight. We are creating these vast records of everything we do. It's very difficult to pull those records together and make sense of them but that's exactly what Google's job is. That's why they are in business. Are they doing the work of a potentially corrupt or abusive government? Yes, you can't deny that they are. The question is will they make a stand against it at some point and/or will they make it transparent to me so I can see what they know about me and I can edit it or decide that I wish to become anonymous. CNN: Google has apparently set itself up as an anti-corporate company, but in a way, they are the biggest corporate company in the world. How does this tension work in reality? JB: It's a huge tension when their goal is to provide you the best services, the most useful, efficient, productive, amazing, astonishing services. I believe they really want to do that. I've met so many people at Google and they really are well intentioned. But in order to do that they have to build the exact same kind of service that those with ill intentions might want to take advantage of. That's a tension that they are going to have to navigate. CNN: Is there anything on the Web that you haven't been able to find? JB: Absolutely. Microsoft did a study about a year and a half ago that claimed that only 50 percent of any search actually completes what people are looking for. That is quite a high percentage. There's lots of things I haven't found on the Web I've been looking for, so when that happens I pick up the phone and call a person and then they just tell me one thing and I go back and do the search and there it is. Whether it's just you know the name of an obscure regulation, or whatever it is, or perhaps I just don't know how to ask the right question. I think the hardest thing in the world is how to ask the right question, it is not how to find the answer it is how to ask the right question. Load-Date: December 27, 2005 End of Document Why we made a car for blind drivers CNN.com

Time: 29/06/2001  
Anchor: In the same spirit of competition among the best and the brightest, some of the best robots in the world tackled an obstacle course recently. Fred Wayne reports. FRED WAYNE, Correspondent: The robot's name is 'T.J.,' engineered by IBM. And finding that second pole was the equivalent of a human running the hundred-yard dash in world record time. A dozen mechanical entrants went through their paces in the first annual Robot Olympics. The task was to successfully navigate a special course, locating ten poles and avoiding boxes along the way. The American Association for Artificial Intelligence hosted the competition. PATRICK HAYES, American Association for Artificial Intelligence: They've been given a chance to explore the area, rather like a rat might explore a maze. That happened yesterday, and now they can use their memory, if they've got a memory, to help them go from place to place, just as a rat, once he knows the maze, can go straight where it wants to go. WAYNE: Radio transmissions linked each robot to a computer, which processed the information coming form the robot's sensors so decisions could be made about which way the machine should move. The robots are equipped with a variety of different kinds of sensors so they can learn about their environment. For short distances, infra-red sensors here. This one has sonar for longer distances. It's also equipped with a television camera so it can see its environment. And some are equipped with lasers. Development costs for the robots range from a half million dollars all the way down to $ 300 for 'Scarecrow,' a product of the Massachusetts Institute of Technology. 'Scarecrow' was built without memory capability and sometimes lost its way. And even the most sophisticated robots have their little quirks. DAVE KORTENKAMP, University of Michigan: They still drive us crazy every once in a while by doing things we don't expect them to do. WAYNE: Most robots here were built for research, but future models could be used to patrol buildings or scan for radiation in nuclear power plants or deliver food to hospital rooms. And which robot proved it had the right stuff, the best of its kind? That honor went to the entry from the University of Michigan, a robot known by the nickname 'Carmel,' an acronym for the government agency that helped pay for it. O'BRIEN: In case you're curios, CARMEL stands for Computer-Aided Robotics for Maintenance, Energy and Life support. No wonder they use an acronym. The preceding text has been professionally transcribed. However, although the text has been checked against an audio track, in order to meet rigid distribution and transmission deadlines, it has not yet been proofread against videotape. Load-Date: October 7, 1992 End of Document Internet Fertile Ground for Movie Marketers CNN CNN LIVE THIS MORNING 09:00

Time: 10/07/2001  
[voice-over] A trial, by a jury of one's peers, is known worldwide to be one of the most fundamental tenets of the U.S. justice system. But can one have a virtual peer? A virtual juror? Well, New York University Law School is experimenting with the concept of a virtual jury, in effect, a trial by computer. Christine Negroni tells us more about it. CHRISTINE NEGRONI: [voice-over] When jurors found O.J. Simpson not guilty, more than a difference of opinion separated them from New York computer scientist, Joseph Bonuso. JOSEPH BONUSO, The Solomon Project: We found O.J. guilty beyond reasonable doubt. He was guilty of murder. CHRISTINE NEGRONI: [voice-over] Bunuso is one of many these days who sustain an objection to a jury's ability to mete out justice. JOSEPH BONUSO: A jury is a manipulated group of puppets. Juries commonly violate the judge's instructions, and the instructions are not very difficult to follow, they just don't want to. CHRISTINE NEGRONI: [voice-over] While the Simpson case wasn't the first trial where the jury's verdict was criticized, it has focused attention on the jury system. That's why this technology to conduct trials by computer is getting attention. As designed, the Solomon Project, at the New York University Law School, is supposed to take the jury out of jurisprudence, casting all trials to the impartiality of artificial intelligence. Solomon was tested on some highly sensational cases, testimony, evidence and precedents were entered into the computer, and a complicated formula using fuzzy logic helped render a verdict. JOSEPH BONUSO: We found Mike Tyson to be innocent, we found William Kennedy Smith innocent, we found Claus von Bulow to be guilty. CHRISTINE NEGRONI: [voice-over] But to critics, the ability to conduct a trial by main frame is a moot point. Forget the big cases, they argue that Solomon can't find a way around the Constitutional right to a trial by a jury of one's peers. JOHN RAY, Defense Attorney: A computer is not a peer. A computer is not a human, it can't possibly think. And no criminal defendant would want to take the risk, I think, of facing a computer. JEFFREY ABRAMSON, Author, 'We the Jury': It looks to me like Star Trek meets the jury. More like artificial nonsense than artificial intelligence. CHRISTINE NEGRONI: [voice-over] According to the experts, the preponderance of evidence at this point is that Solomon won't replace juries anytime soon but it could find an audience among lawyers looking to take their case to a trial run and get a computerized verdict that will predict what human jurors might decide. Christine Negroni, CNN, New York. BRIAN NELSON: Stay with us. In just a moment we're going to revisit our favorite computer story of 1995. [voice-over] The Benedictine monks of New Mexico, traded quills for computers and showed us how high technology doesn't mean giving up your way of life. [Commercial break] The preceding text has been professionally transcribed. However, although the text has been checked against an audio track, in order to meet rigid distribution and transmission deadlines, it has not yet been proofread against videotape. Load-Date: December 31, 1995 End of Document "A.I." Tops Weekend Box Office CNN CNN LIVE THIS MORNING 09:00

Time: 29/06/2001  
 even though the government now auctions off the licenses to the highest bidder, the scams go on. That's Your Money, I'm Irv Chapman, CNN Business News, Washington. Wall Street Using Computers to Manage Portfolios KITTY PILGRIM, Anchor: Now here's a cyber-fad that so far is making money - computer aided investing. John Metaxas has the latest on the brave new world as artificial intelligence hits Wall Street. JOHN METAXAS, Correspondent: Wall Street legends like Peter Lynch and Warren Buffet made their names by picking the right stocks, but now, some investors are betting computers can think faster and more accurately than the Wall Street pros. BRAD LEWIS, Portfolios Manager, Fidelity Investments: I've got a Pentium machine that works seven hours every night crunching these numbers, and, you know, it would take us the rest of our lives plus some to do the same amount of work. JOHN METAXAS: Wall Street has used computers before, but now sophisticated software is designed to mimic the way our brains interpret information. These artificial intelligence programs can sift through mountains of statistics - such things as price earnings ratios, balance sheet data and interest rates - and detect patterns. In effect, learning to forecast the movement of a stock or index. Nichols Oelsner Management, a New York investment partnership, relies on a kind of artificial intelligence called a neural network to hedge market risk. NADINE OELSNER, President, Nichols Oelsner Management: When we get a signal to sell, what it's basically saying is that over the next five days the market will correct itself by about one percent or more, and it tells us how to implement our options strategy to protect what we have already paid in our underlying portfolio. JOHN METAXAS: Nichols Oelsner says its computer model can predict the market's short-term direction 70 percent of the time, and Brad Lewis' $2 billion disciplined equity fund has beaten the S&P Index seven years in a row. But can a computer ever totally match human investment genius? David Braverman's system tries to mimic the mind of Warren Buffet. DAVID BRAVERMAN, Director, Quantitative Research, Standard & Poor's Equity Services: Mr. Buffet is using some qualitative criteria. For example, when he buys Cap Cities/ABC he's buying Tom Murphy, the chairman, and he's buying what he considers superior management. And that's something that, as much as we might try, the computer can't do. BRAD LEWIS: The investors don't necessarily care how the stocks are picked, as long as it makes them money. JOHN METAXAS: John Metaxas, CNN Business News, New York. Highest Priced Stock On the Market Unlikely to Split KITTY PILGRIM, Anchor: Berkshire Hathaway, the Nebraska based company operated by the legendary investor Warren Buffett does hardly anything the way other companies do. Even in the roaring, soaring 1995, it was remarkable. Berkshire Hathaway's share price rose by over half, putting the price of a single share well over $30,000. So, contributing editor Bill Rukeyser wants to know why on earth doesn't this company split the stock bringing it down to a level where ordinary mortals could buy some? WILLIAM S. RUKEYSER, Contributing Editor: The idea hasn't occurred to Buffett. Some of the shareholders have been begging for a split at least since the early 80s when Berkshire Hathaway stock went for a mere $1,000 or so a share. So why doesn't Buffett do it? His own explanation, for what it's worth, is essentially that dividing the stock into smaller, cheaper units would force him to rub elbows with a lower order of stock holders. He seems to feel the same way about stock holders that he does about businesses he buys. WARREN BUFFETT, Chairman, Berkshire Hathaway: I'm like a basketball coach. I mean, I walk out on the street and I look around for seven footers. WILLIAM S. RUKEYSER: Even if Berkshire Hathaway did split, let's say at an unheard of rate of 100 shares for one, it would still be the most expensive stock on the New York Stock Exchange. The runner up Washington Post company has lately sold for around $290 a share or less than 100th of Berkshire's $30,000 plus. This has led me to what I believe to be the true reason Warren Buffett won't split his stock. In 1969, when Warren Buffett became chairman of Berkshire Hathaway, the price of the stock was $20. It took off in the mid-70s and the after burners really kicked in over the past 10 years. That's the exciting curve that Warren's mind's eye sees every morning in the bathroom mirror when he's shaving. A simple one liner that sums up the life's work of a financial hero. I don't think he wants to mess up the picture. William S. Rukeyser for CNN Business News, New York. Antique Furniture Can Be Pricey or Priced Just Right KITTY PILGRIM, Anchor: A big New York auction house once sold an early American table for more than $2 million. Well, as John Metaxas tells us, antique, American furniture is a booming collectors' market and a great inspirer of passion. LEIGH KENO, American Antiques: When I was 13, I wrote in my diary that I wanted to come to New York, work in the auction houses and then become a dealer in American furniture. JOHN METAXAS, Correspondent: Leigh Keno has spent his life collecting America's finest furniture and found his heart's desire while he was at it. LEIGH KENO: I fell in love with the Queen Anne form, these beautiful, 's' curve lines. JOHN METAXAS: If you want to start your own collection of antique furniture, Leigh suggests training your eye with a lot of browsing. LEIGH KENO: Go to the flea markets and go to the shows such as this and really touch the pieces, look at the pieces, take the drawers out and really learn about the pieces. JOHN METAXAS: Some pieces like this Philadelphia Chippendale low boy are worth more than a half million dollars, but you do not have to spend a fortune to find a good piece. LEIGH KENO: The best way to start would be to buy more simple versions of these- the expensive pieces. Maybe to buy a dressing table, a low boy, with- we have one in our booth that's highly carved. You might buy one without carving, much more simple piece for about one 20th the price. JOHN METAXAS: You might be able to find a simple Chippendale side chair for $4,000. A piece in good condition will always go up in value. But do not count on that for your retirement. For one thing, it's very easy to be fooled. LEIGH KENO: There's some fabulous pieces to be found, but there are many pieces that are either total fakes or pieces that are legitimate pieces but they've had many major replacements. A $100,000 table with a new leg is probably worth about $5,000, so you see it completely- it makes the piece unsalable really to a true collector. JOHN METAXAS: Don't bank on your antiques rising in value, buy as an investment in your home because it's your heart's desire. That's Your Money. I'm John Metaxas, CNN, Business News, New York. Belsky on 1035 Exchange Form and Share Tax Exemptions KITTY PILGRIM, Anchor: Time now to answer your questions about managing your money, and our topics for the week - exchanging insurance and mutual fund companies. Our first question comes to us from Lael Schneider of Augusta, Wisconsin, who writes, 'I have an endowment insurance policy for my daughter that matures in February 1996, and I've heard about something called a 1035 exchange that would allow me to avoid paying taxable gain on the policy right now. Have you ever heard of this?' Well, joining us now to answer that is Gary Belsky from Money magazine. GARY BELSKY, Correspondent: Yes, I have heard of that. A 1035 exchange allows people to switch from one insurance policy to another, and by so doing, you can actually avoid paying taxes that might be due when the existing policy matures or expires, but, however, there are some qualifications that you have to meet. It has to be the same policy that you're switching from one to another, and it can only be an endowment policy so this woman is covered or an annuity policy or a life policy. Also, the beneficiary of both policies has to be the same person. So in that case, you can switch using a 1035 exchange form. KITTY PILGRIM: Well, how exactly- What are the mechanics of switching? How do you do that? GARY BELSKY: Well, the agent who's selling you the new policy can very easily get a hold of a 1035 exchange form and have you fill it out. If you don't have an agent and you just sort of think that you want to exchange policies and you want to stay within the same company, you can call the home office of the insurance company that issues your current policy, and they'll send you the form and walk you through it. But it's a very- It's a pretty simple form, although it has to be filled out by an agent because there are some specifics to it that might be complicated. KITTY PILGRIM: It sounds very straightforward. GARY BELSKY: It's very straightforward. It's a good deal if you want to get a policy that has better advantages or if you want to avoid paying taxes at a specific time. KITTY PILGRIM: Great. Good to know, especially right about now. GARY BELSKY: Yeah. KITTY PILGRIM: Well, our next question comes to us from Robert Carswell of Riyadh, Saudi Arabia, and he writes, 'Are the sales loads and transaction fees paid to mutual fund companies tax deductible as investment expenses?' Gary, with so many people in funds these days, we really should cover this topic. GARY BELSKY: Yes, and the answer for both fund shares and even regular stock shares is no, they're not tax deductible. Because they are considered part of the basis cost of acquiring your shares, they're figured in capital gains calculations. In other words, if your share cost you $10 and you sell it for $12, they factor into the $10 how much the shares costs for the commissions and the sales load. However- Well, and as a result, the government won't let you use those numbers twice. In other words, they won't let you deduct it as a part of the basis cost and then also deduct it as an investment expense. KITTY PILGRIM: But there are some fees that are deductible. GARY BELSKY: Yeah, there are investment fees that you can, you know, deduct on your taxes. Basically, any fees that you pay to an adviser for advice in managing your portfolio, basically running your investments - like a portfolio manager or an accountant who helps you figure your taxes out - that you can deduct, but you can't deduct commission charges or sales loads. KITTY PILGRIM: Too bad. GARY BELSKY: Nope. KITTY PILGRIM: Sorry. If you have a question, send it our way. Write to Your Money Questions, CNN, 5 Penn Plaza, New York, New York, 10001. And please include your phone number. Ad Exec Says Lunch Box Collection Brings out Creativity KITTY PILGRIM, Anchor: Sometimes a whim can lead to a passion that is actually good for business; helping you make money while having fun. Well, Richard Kirshenbaum collects lunch boxes, and as Jill Brooke reports, the advertising executive's colorful collection is becoming almost as famous as his ads. JILL BROOKE, Entertainment Correspondent: Richard Kirshenbaum, the chairman of the advertising firm Kirshenbaum and Bond, isn't out to lunch, he just collects lunch boxes, especially lunch boxes from old TV series including Happy Days, The Partridge Family, and the Cosby Kids. RICHARD KIRSHENBAUM, Lunch Box Collector: I wanted a TV show theme because I am in the communications business and I make TV commercials. JILL BROOKE: Over the past few years his lunch box collection has become almost as famous as his memorable image making ads. [excerpt from advertisement] RICHARD KIRSHENBAUM: It's wonderful to see your CEO walk into the office and say, 'Wow, I had this Batman lunch box, this is amazing.' And you see that they turn into a kid, and I love that and I think that really helps my business because it's important to think creatively and to get that little bit of kid back again. This is a Roy Rogers and Dale Evans Double R Bar Ranch lunch box, and it's probably one of the most valuable ones because it's probably one of the oldest, and it's all metal. But the thing that interests me is not necessarily the value. I like the fact that certain lunch boxes have personality and are a little bit beat up, and show the personality of the people who owned it. So, for example, this Charlie's Angels lunch box was originally owned by somebody who put a little, you know, butterfly sticker on it and, like, knocked out Kate Jackson's tooth there. I think it's kind of great, it shows the personality of the person who owned it. JILL BROOKE: Kirshenbaum bought the lunch boxes at flea markets for less than $25, and now some are worth $500, but that's not why he collects them. RICHARD KIRSHENBAUM: The fun about collections and collecting isn't necessarily that you have to have a lot of money- as I said, I've only paid up to $25 for each piece- it's just the fun of it. JILL BROOKE: That's Your Money, Jill Brooke, CNN Business News, New York. The preceding text has been professionally transcribed. However, although the text has been checked against an audio track, in order to meet rigid distribution and transmission deadlines, it has not yet been proofread against videotape. Load-Date: February 6, 1996 End of Document Showbiz Today Reports: Special Effects Featured in Summer Flicks CNN CNN LIVE THIS MORNING 09:00

Time: 29/10/2013  
On a recent morning Natanel Dukan walked into the Paris offices of the French robot maker Aldebaran and noticed one of the company's humanoid NAO robots sitting on a chair. Mr. Dukan, an electrical engineer, could not resist. Bending over, he kissed the robot on the cheek. In response the NAO tilted its head, touched his cheek and let out an audible smack. It is certainly a very French application for a robot, but the intimate gesture by the $16,000, two-foot robot, now being used in academic research labs and robotic soccer leagues, also reflects a significant shift. Until recently, most robots were carefully separated from humans. They have largely been used in factories to perform repetitive tasks that required speed, precision and force. That generation of robots is dangerous, and they have been caged and fenced for the protection of workers. But the industrial era of robotics is over. And robots are beginning to move around in the world. More and more, they are also beginning to imitate -- and look like -- humans. And they are beginning to perform tasks as humans do, too. Many of the new generation of robots are tele-operated from a distance, but are increasingly doing tasks independent of direct human control. For instance, Romeo, a five-foot humanoid robot, will soon be introduced by Aldebaran as a ''big brother'' to the pipsqueak, kissing NAO robot. Created with the assistance of $13.8 million from the French government, the costly robot is being programmed to care for older people and assist in the home. To provide useful assistance, it will have to do more than the repetitive work already being performed by commercial robots in factories, hospitals and other settings. Moreover, the new robots are designed not just to replace but to collaborate with humans. The idea that robots will be partners of humans, rather than stand-ins or servants, is now driving research at universities and industrial laboratories. This year, new United States industry standards for robotic manufacturing systems were published, underscoring the emergence of the field. The standards specify performance requirements that will permit human workers to collaborate with robots directly, and they reverse manufacturing guidelines from 1999 that prohibited ''continuous attended operations'' requiring humans to be in close contact with robots that were deemed unsafe by the industry. Today's robot designers believe that their creations will become therapists, caregivers, guides and security guards, and will ultimately perform virtually any form of human labor. (Robots that can think on their own -- that is, perform with high levels of artificial intelligence -- have yet to arrive.) The key to this advance is the new robots' form. Their humanlike appearance does more than satisfy science-fiction fantasies. Roboticists say they are choosing the human form for both social and technical reasons. Robots that operate indoors, in particular, must be able to navigate a world full of handles, switches, levers and doors that have been designed for humans. Roboticists also point out that humans have an affinity for their own shape, easing transitions and making collaboration more natural. Creating robots in humanoid form also simplifies training and partnerships in the workplace, and increases their potential in new applications like caregiving. It is still unclear how well these new faux-people will be accepted by society, for they raise fundamental questions about what it means to be human. However, rapid improvements in computer vision, processing power and storage, low-cost sensors, as well as new algorithms that allow robots to plan and move in cluttered environments, are making these new uses possible and in the process changing the nature of robotics. ''This is the wave that's happening in robotics right now,'' said Charlie Kemp, an associate professor in biomedical engineering at the Georgia Institute of Technology in Atlanta. ''Things are not the same when you're interacting with people. That's where we want robots to be; it's where we see there are huge opportunities for robots; and there are very distinct requirements from what led to the classic industrial robot.'' And so on factory floors around the world, a new breed of robot is being manufactured by companies like Rethink Robotics of Boston, which makes a humanoid robot for simple factory automation tasks, and Universal Robots of Odense, Denmark, which makes a dual robot-arm system designed for doing more traditional factory applications, but without cages. Rethink Robotics recently released a video of its robot, Baxter, making a cup of coffee with a Keurig coffee machine. The company said the humanoid robot, with tong-like hands and a computer-screen face, was trained to carry out a variety of preprogrammed coffee-making tasks in just several hours. In Dr. Kemp's Healthcare Robotics lab at Georgia Tech, a five-foot robot named Cody, which is able to sense forces on its arms and has a base that allows it to move gracefully, is being used as a dance partner for both experienced human dancers and patients in physical therapy. ''This is a way that robots can be used for fun, interactive exercise in rehabilitation,'' Dr. Kemp said. ''We can also use it as a tool to understand whole body physical interaction between people and robots.'' At Carnegie Mellon University, Manuela M. Veloso, a professor of computer science, has developed a series of mobile robots she calls CoBots to perform tasks like delivering mail, guiding visitors to appointments and fetching coffee. She calls it ''symbiotic autonomy,'' since the robots also rely on humans. For example, because they don't have arms, they can't operate elevators, so they have been programmed to wait and ask for human assistance. If they get lost, they stop, call up a map of the building on their computer screens, interrupt a passing human and say, ''I am lost, can you tell me where I am?'' ''The robotics community calls the idea cheating,'' Dr. Veloso said, ''but it's not. It's the secret to real autonomy.'' To function in the real world and to be safe, robots must have a radically different design from factory robots, which are based on ''stiff'' actuators capable of moving with great speed to a precise position. The new robots have ''compliant actuators,'' which respond to external forces by yielding in a natural fashion. The original research into this area of what is now known as ''soft robotics'' began in the mid-1990s at the Massachusetts Institute of Technology, with work by Gill Pratt, who was exploring walking robots, and Matthew Williamson, then a graduate student and now director of technology development at Rethink Robotics. The research was not initially focused on solving the problem of human interaction, but the scientists soon realized the implications, recalled Dr. Pratt, who is now the project manager for the Defense Advanced Research Projects Agency's Robotics Challenge, an upcoming contest that is intended to advance robotics technology to be used in natural disasters and other emergencies. ''It actually started with numerically controlled machine tools,'' he said -- using computer-controlled robots to perform milling tasks. For those manufacturing uses, what mattered was the precise positioning of the robot limb. However, Dr. Pratt was focused on developing walking robots that could move in the natural world, and force was more significant than precision to meet that challenge: ''There the position of the limb didn't matter so much, but what mattered was how hard was the robot pressing on the world, and how hard the world was pressing back on the robot,'' he said. The solution was to put something elastic, like a spring, between the motor and the joint. These are now described as series elastic actuators, and the technique of installing them is now widely used as a low-cost solution for robots that are both nonthreatening to humans and able to move more agilely in the natural world. ''In the Darpa Robotics Challenge, almost all of the robots that are being used there have series elastic actuation or other types of compliant control,'' he said. ''The reason is both because it makes the locomotion task easier and the manipulation task easier, and it also makes it possible for the robot to be gentle when it does things and not make things worse.'' Dr. Pratt recalled an incident when the researchers first realized that series elastic actuation was the key to freeing robots from their cages. While working on an early humanoid robot named COG, in a project led by Rodney Brooks, the founder of Rethink Robotics who was then director of the M.I.T. artificial intelligence lab, they were demonstrating how the robot could do tasks like writing with a pencil and paper. However, there was a bug in the software, causing the robot's arm to repeatedly bang the table. Dr. Brooks decided it was an opportunity to demonstrate the safety of the technology. He placed himself between the table and the arm, which began spanking him. Roboticists describe this original approach as ''passive compliance.'' Today there are other approaches -- ''active compliance'' -- that use software and sensors to blend speed and precision of more rigid robots with operations that are safe around humans. http : // www.nytimes.com/2013/10/29/science/making-robots-more-like-us.html Graphic PHOTOS: RoboThespian, above, made by a British company, is multilingual and designed for human interaction in public. Schunk promoted its Five- Finger Hand as ''almost as talented as its human model.'' (D1) NAO, top, by Aldebaran, a research and education robot. THOR, center, by Robotis, can work in a disaster zone. Philip K. Dick, by Hanson, an android based on the late sci-fi author. (PHOTOGRAPHS BY DAVID WALTER BANKS FOR THE NEW YORK TIMES) (D2) Load-Date: October 29, 2013 End of Document TECHNOLOGY; Intel and Alzheimer's Group Join Forces The New York Times

Time: 01/08/2002  
a room the size of a small classroom, under the gaze of Tweety Bird and Tekno the robotic puppy, Bob Del Principe engages his newest creation. The floor is littered with stuffed animals, and the walls are covered with role-play kits complete with swords, whistles and walkie-talkies. But Mr. Del Principe's attention is fixed on a doll. She sits on the conference table in a denim jumper, with white-blond hair tied in a ribbon. The company that makes her, Manley Toy Quest, has named her Cindy Smart. She can hear. She can talk. But above all, Cindy is the first doll that can see -- a feat that Mr. Del Principe, a toy maker, describes as the holy grail of his craft. He sits down at the table and opens the conversation. "Cindy?" he says. In a little peeping voice, she answers, "I'm here." "Do you want to play school?" he asks. "Yes!" she says. He places a card with the word "dog" on the bulletin board in front of her. "Can you read the word?" he asks. "D-O-G," she says. "Dog." "Very good," Mr. Del Principe says. "That's because I have the best teacher in the world," she replies. As the conversation continues, it is somewhat reassuring that Cindy is tethered to a circuit board. In fact, even with the circuit board in sight, talking about Cindy while she chatters away in the background is like talking about a small child while the child is present. Soon, the contents of the circuit board will be placed on a microchip, and Cindy will be free to read, talk, tell time and solve math problems without any visible sign of her electronics. Adults who observe interactions with the doll often describe the experience as spooky. "It's scary to people," said Tara Cortner, associate marketing manager for Manley Toy Quest. "They wonder what's going to happen with toys." The company plans to start selling the doll in September for $99 on the Home Shopping Network, with a limited production of fewer than 10,000 dolls this year. For that price, buyers will receive the doll, a chair, a desk, a bulletin board and a CD that contains 33 lessons. The doll's "vision" and her real-time conversation are made possible by improvements in voice recognition technology, a touch of artificial intelligence and a 16-bit microprocessor that the company created over the last year. The new chip processes information much faster than the 4-bit processors typically used in electronic toys. It stores a database of images, including words, letters, numbers, shapes, colors and the positions of hands on a clock. A tiny camera hidden by a bee-shaped brooch on Cindy's jumper captures images from the bulletin board and matches them to those stored in the database. The doll is stocked with 700 words and can recognize 77 phrases. Cindy is programmed to pretend that she does not know some very simple words, like "cat," so that a child can teach them to her. Manley Toy Quest, which is based in Hong Kong, has been making toys for 30 years. Its products include robotic pets, electronic hand-held games and stuffed animals that are sold at theme parks. A privately held company, it has about $300 million in sales a year. The company's new doll has created a lot of excitement in the toy industry, said Jim Silver, publisher of The Toy Book, a trade magazine that covers the toy industry. "It's never been done before," Mr. Silver said. "This is something that's entirely original." Mr. Silver said that demand for technology in toys was growing. The challenge for Cindy Smart, he said, will be whether the market will support a doll in this price range. "In the past, we have seen $70 dolls sell very well," he said. "This is a $100 doll. We're going into new territory with this one. But this is not your typical doll." Mr. Del Principe, who is Manley Toy Quest's vice president for research and development, said that Cindy Smart could be a pacesetter, much like Chatty Cathy, the talking doll introduced by Mattel more than 40 years ago. "Every doll after that had to talk," he said, adding that Cindy Smart could have the same effect. "In five or 10 years, toys will routinely have this technology." By next year, he said, Cindy will be able to read Japanese, a notable addition to her current library of basic words in French, Spanish, German and Italian. And as processing power increases over time, Mr. Del Principe said, he anticipates creating dolls that can read sentences and recognize faces. But for now, the toy maker delights in simple conversation. "Cindy?" he says. "I'm here," she answers. "I love you," he says. "I love you!" she replies. http : // www.nytimes.com Graphic Photo: TALKING BACK -- Cindy Smart, from Manley Toy Quest, makes use of voice recognition and artificial intelligence to give real-time responses. (Marissa Roth for The New York Times) Load-Date: August 1, 2002 End of Document Branching Out in Science The New York Times

Time: 04/02/2007  
most of the last two decades, a quixotic science called neural network theory has been suffering through a dark age. All but a handful of enthusiasts had given up their dream of making intelligent computers by using networks of artificial neurons to electronically mimick the brain's circuitry. Now the field is undergoing a renaissance in which neurobiologists, psychologists and computer scientists are joining together to use artificial neural networks as a research tool to help answer one of the oldest questions in philosophy: how does the mind arise from the brain? Last month, 1,600 people attended the second annual International Conference on Neural Networks, which is sponsored by the San Diego chapter of the Institute of Electrical and Electronics Engineers. Another organization, the International Neural Network Society has recruited more than 2,500 members since it was formed last year. While many of the field's supporters are investors and engineers who are interested in using neural networks to make more intelligent computers, a number of scientists and philosophers are after bigger game. By trying to make artificial neural networks that learn, perceive and remember, they hope to gain new insights into how people think. ''The possibility is really before us to start making models that bridge the gap between neurons and complex behavior,'' said Patricia Smith Churchland, a philosopher at the University of California at San Diego. ''For years there has been this great no-man's-land between the two levels. Now we're really beginning to investigate that no-man's-land, and in the long haul we might get a theory of how the brain works.'' The new developments in neural networks ''are tremendously important for philosophers,'' she said. ''Plato's question was, 'What is knowledge and how is it possible?' Now we have a real shot at answering that.'' Since neurons, or brain cells, work something like electronic switches, scientists have long wondered if they could replace them with tubes or transistors. By roughly simulating the brain's own circuitry, a new generation of neural network researchers is beginning to design systems that can understand some of the ambiguities of spoken language and visual scenes, and learn, like people, through the process of induction. In fact, neural network theory is beginning to generate some of the interdisciplinary excitement that surrounded molecular biology in the years after World War II, when physicists like Francis H. C. Crick, who shared a Nobel Prize for discovering the structure of DNA, joined with biologists to explain how life arises from inanimate molecules. Followers Heartened In recent years, Dr. Crick, who is now at the Salk Institute in La Jolla, Calif., has turned his attention to neuroscience and become an important participant in an ongoing neural network seminar. Another Nobel laureate, Leon N. Cooper, of Brown University, who helped develop the classic theory of superconductivity, has also become a leader in the neural network field. Followers of the field were especially heartened last month when Marvin Minsky, an iconoclastic computer scientist who has been one of the discipline's most withering critics, appeared at the meeting in San Diego and gave his blessing to the new endeavor. ''I'm not the devil,'' he told his audience, predicting that in the next two decades scientists would discover that the brain consists of a whole society of neural networks, some that know how to see, some that know how to listen, some that know how to coordinate the efforts of other networks. In their 1969 book, ''Perceptrons,'' Dr. Minsky and Dr. Seymour Papert of the Massachusetts Institute of Technology showed that there were sound mathematical reasons why such artificial networks would never be capable of interesting intellectual behavior. ''He's in some sense the bad guy,'' said James A. Anderson, a psychologist at Brown University. ''He kind of torpedoed it.'' For years Dr. Minsky urged his students to pursue instead a separate effort called artificial intelligence, in which scientists use computer programs to mimic the psychology, not the biology of the brain. The details of neuronal chemistry do not matter, he contended. Return to Original Idea In the last five years, however, developments in artificial intelligence have been much slower than its champions had hoped. Meanwhile, rapid advances in neurobiology have led many researchers to wonder if the best way to make thinking computers is to return to the original idea of electronically mimicking the brain. Unlike conventional digital computers, which must be given step-by-step instructions, these neural networks are good at tasks like speech recognition that cannot be captured by an explicit list of rules. Given repeated examples, the networks can abstract some of the rules on their own. In the 1950's neural networks were often made by soldering together a few hundred electrical components, then trying to train the assemblage to recognize, for example, the letters of the alphabet. Now scientists can use supercomputers to simulate the networks instead, allowing them to experiment with models that are vastly more complex than the ones Dr. Minsky and Dr. Papert criticized. Now scientists are experimenting with pattern-recognition machines that can read signatures on bank checks or the wavy lines generated by electrocardiograms. In addition, the Defense Department's advanced research projects agency plans a major increase in financing for the development of neural networks to study their possible military applications. Uncovering Principles But more important than practical uses, which are still in their infancy, is the hope that by studying artificial neural networks scientists can finally join biology and psychology, uncovering principles that explain how we think. Historically, neuroscientists have had little to say to philosophers or even to psychologists. Each group has worked under a different set of assumptions about how to go about understanding the interplay between mind and brain. While neuroscience has accumulated a wealth of details about the biology and chemistry of neurons, the field has shied away from grand theories of how the brain works. Psychologists and philosophers, on the other hand, have churned out theory after theory, but few try to anchor their theories in neuroscience. The problem is that the behavior and structure of a single neuron is so complex that faithfully simulating one could easily require the power of an entire computer. Moreover there are believed to be about 100 billion neurons in the brain. Trying Various Arrangements Neural network theory is based on the belief that it is not necessary to mimic every note in the medley of molecular chain reactions that generates a spike of neural electricity. Instead scientists look at a neuron in the abstract, as a device that receives signals from other neurons, evaluates them according to certain standards, and sends its own message out the other end. Then they connect hundreds of these simplified neurons into networks, experimenting with various arrangements until they come up with a system that performs some brainlike task. ''A thousand neurons is about as many as you can do with a supercomputer,'' Dr. Anderson said. ''Fifty to 100 is the critical barrier. Over that you start getting really interesting behavior.'' By developing special neural network hardware, scientists hope to increase the number of neurons, coming continually closer to the threshold at which they hope intelligent behavior will emerge. A neural network researcher with a psychological bent might start with a theory - how we learn simple concepts, for example - then try to design a network that operates accordingly. David E. Rumelhart of Stanford University and his colleagues have developed a network that learns, through examples, how to generate the past tense of verbs. If such a network is successful neurobiologists might see if they can find similar architectures within the wilderness of connections in the human brain. One Smell From Another But the process can also work the other way around. At the University of California at Irvine, Richard Granger, a computer scientist, and Gary Lynch, a neurobiologist, have collaborated on a computer model of the olfactory cortex of the rat, the structure it uses to process smell. They have built a network that learns, in a rudimentary manner, to tell one smell from another and sort them into proper categories. This, they hope, will lead to a theory of how the brain forms concepts. ''Neural networks are serving as a medium or a mathematical language for describing all these phenomena,'' said Terrence J. Sejnowki of Johns Hopkins University's Department of Biophysics. ''There is still a big gulf between psychology and neuroscience, but at least they're now in the same mathematical ballpark.'' As neural networks become increasingly complex, they promise to defy the ability of mathematicians -and even therapists - to comprehend them. While some scientists will act as network psychologists, studying the gross behavior of the machines, others will descend into specifics, trying to understand what makes their creations tick. If the details of this biology of the artificial can be mapped onto the biology of real brain cells, then a general theory of intelligence might emerge. Graphic Photo of Marvin Minsky (Gloria Rudisch); End of Document Suddenly the Cold War Is a Cool Event The New York Times

Time: 14/04/2008  
It's not easy to write a book. First you have to pick a title. And then there is the table of contents. If you want the book to be categorized, either by a bookseller or a library, it has to be assigned a unique numerical code, like an ISBN, for International Standard Book Number. There have to be proper margins. Finally, there's the back cover. Oh, and there is all that stuff in the middle, too. The writing. Philip M. Parker seems to have licked that problem. Mr. Parker has generated more than 200,000 books, as an advanced search on Amazon.com under his publishing company shows, making him, in his own words, ''the most published author in the history of the planet.'' And he makes money doing it. Among the books published under his name are ''The Official Patient's Sourcebook on Acne Rosacea'' ($24.95 and 168 pages long); ''Stickler Syndrome: A Bibliography and Dictionary for Physicians, Patients and Genome Researchers'' ($28.95 for 126 pages); and ''The 2007-2012 Outlook for Tufted Washable Scatter Rugs, Bathmats and Sets That Measure 6-Feet by 9-Feet or Smaller in India'' ($495 for 144 pages). But these are not conventional books, and it is perhaps more accurate to call Mr. Parker a compiler than an author. Mr. Parker, who is also the chaired professor of management science at Insead (a business school with campuses in Fontainebleau, France, and Singapore), has developed computer algorithms that collect publicly available information on a subject -- broad or obscure -- and, aided by his 60 to 70 computers and six or seven programmers, he turns the results into books in a range of genres, many of them in the range of 150 pages and printed only when a customer buys one. If this sounds like cheating to the layman's ear, it does not to Mr. Parker, who holds some provocative -- and apparently profitable -- ideas on what constitutes a book. While the most popular of his books may sell hundreds of copies, he said, many have sales in the dozens, often to medical libraries collecting nearly everything he produces. He has extended his technique to crossword puzzles, rudimentary poetry and even to scripts for animated game shows. And he is laying the groundwork for romance novels generated by new algorithms. ''I've already set it up,'' he said. ''There are only so many body parts.'' Perusing a work like the outlook for bathmat sales in India, a reader would be hard pressed to find an actual sentence that was ''written'' by the computer. If you were to open a book, you would find a title page, a detailed table of contents, and many, many pages of graphics with introductory boilerplate that is adjusted for the content and genre. While nothing announces that Mr. Parker's books are computer generated, one reader, David Pascoe, seemed close to figuring it out himself, based on his comments to Amazon in 2004. Reviewing a guide to rosacea, a skin disorder, Mr. Pascoe, who is from Perth, Australia, complained: ''The book is more of a template for 'generic health researching' than anything specific to rosacea. The information is of such a generic level that a sourcebook on the next medical topic is just a search and replace away.'' When told via e-mail that his suspicion was correct, Mr. Pascoe wrote back, ''I guess it makes sense now as to why the book was so awful and frustrating.''Mr. Parker was willing to concede much of what Mr. Pascoe argued. ''If you are good at the Internet, this book is useless,'' he said, adding that Mr. Pascoe simply should not have bought it. But, Mr. Parker said, there are people who aren't Internet savvy who have found these guides useful. It is the idea of automating difficult or boring work that led Mr. Parker to become involved. Comparing himself to a distant disciple of Henry Ford, he said he was ''deconstructing the process of getting books into people's hands; every single step we could think of, we automated.'' He added: ''My goal isn't to have the computer write sentences, but to do the repetitive tasks that are too costly to do otherwise.'' In an interview from his home in San Diego and his offices nearby, Mr. Parker described his motivation as providing content that the marketplace has otherwise neglected for lack of an audience. That can mean a relatively obscure language is involved, or a relatively obscure disease or a relatively obscure product. Take, for example, the study of bathmats in India. ''Only one person in the world may be interested in that,'' he conceded, ''probably a strategic planner for a multinational that makes those.'' But he points out that once he has trained the computer to take data about past sales and make complex calculations to project future sales, each new book costs him about 12 cents in electricity. Since these books are print-on-demand or delivered electronically, he is ahead after the first sale, he said. His company, the Icon Group International, is the long tail of the bell curve come to life -- generating significant total sales by adding up tens of thousands of what might be called worst sellers. For example, a search at the Galter Health Sciences Library of the Feinberg School of Medicine at Northwestern University found half a dozen Icon books, mainly in the library for patients and their families. Icon is ''a very innovative and interesting example of print on demand,'' said Kurt Beidler, a senior manager at Amazon.com who runs the publishers' services for BookSurge, Amazon's print-on-demand company. ''A lot of examples of print on demand take older books and bring them back -- really acting as a supply-chain tool. In this kind of business, it's a new business, using this capability to introduce new material to customers.'' Mr. Parker compares his methods to those of a traditional publisher, but with the computer simply performing some of the scut work. In an explanatory YouTube video, Mr. Parker shows a book being created. The computer is given an assignment -- project the latent demand for antipsychotic drugs around the world, based on the sales figures in the United States. ''Using a little bit of artificial intelligence, a computer program has been created that mimics the thought process of someone who would be responsible for doing such a study,'' Mr. Parker says. ''But rather than taking many months to do the study. the computer accomplishes this in about 13 minutes.'' An editor picks the years to be covered, but the computer picks the optimum model for extrapolating sales in various countries, and in alphabetical order produces a chart for each country. ''It will then open a Word document and export the information into Word just like a real author would out of their minds, so to speak, or spreadsheets,'' he says. Artificial intelligence researchers say computers are far from being what the general public would consider authors. ''There is a continuous spectrum, also known as a slippery slope, between a program that automatically typesets a telephone directory and a program that generates English texts at the level of variety you would expect from a typical human English speaker,'' said Chung-chieh Shan, an assistant professor in the computer science department of Rutgers. ''The former program is easy to write, the latter program is very difficult; in fact, the holy grail of linguistics. Like Mad-Libs, Parker's programs probably lie somewhere between the two ends of this spectrum.'' Mr. Parker has lately taken to lighter fare intended to educate. He said he had invested ''upto seven figures into the animation business'' for word-based video games and animated game shows that will teach English to non-English speakers. YouTube has many examples of these games, which have computer- generated scripts. A low-tech version of those games are the thousands of crossword puzzle books Mr. Parker has made in about 20 languages. The clues are in a foreign language and the answers are in English. The computer designs the puzzles and ensures that the words become harder as one progresses. As part of his love of words, and dictionaries in all languages, Mr. Parker said he has taken to having his computers create acrostic poems -- where the first letter of a series of words spells a synonym of those words, often to ironic effect. Of course, one of the difficulties of generating a hundred thousand poems is stepping back and assessing their quality. ''Do you think one of them is Shakespeare?'' he was asked. ''No,'' he said. ''Only because I haven't done sonnets yet.'' http : // www.nytimes.com Correction The Link by Link column on Monday, about collecting publicly available data and using computers to turn the information into a book, misstated the title of Philip M. Parker, who has used the process to generate more than 200,000 books. He is the chaired professor of management science at Insead, a business school based near Paris -- not the school's Eli Lilly professor in innovation, business and society. Correction-Date: April 16, 2008 Graphic PHOTOS: Philip Parker is now turning his efforts to video. (PHOTOGRAPH BY SANDY HUFFAKER FOR THE NEW YORK TIMES)(pg. C1) Philip Parker says he has computers do the substantial amount of repetitive work that is required in the writing of so many books.(PHOTOGRAPH BY SANDY HUFFAKER FOR THE NEW YORK TIMES)(pg. C4) Load-Date: April 14, 2008 End of Document A Rose-Colored View May Come Standard The New York Times

Time: 04/04/2012  
afternoon a 37-year-old man showed up in the emergency room of a Connecticut hospital complaining of shortness of breath, a sense of impending doom and heart palpitations. He had been unable to work for a week because of extreme uneasiness. The attending doctor recommended he be transferred to a psychiatric hospital. But the doctor was talked out of the transfer after he was asked a series of questions, not by another doctor but by a computer program called PsychPro. The program was developed by a New Haven company to use artificial intelligence to assess mental health problems and suggest treatment; in this case the patient was released with a prescription for Alprozolam, a drug for treating panic attacks. Doctors' Suspicions The developer of PsychPro, Dr. William M. Glazer, a professor of psychiatry at Yale, said that "doctors have been very suspicious of these kinds of things because they fear these computerized tools are going to control them, and take away their independence." He said that to some extent the fear was justified. "On the other hand," he said, "there's no blood test, there's no X-ray, for mental illness." Diagnosis "can be viewed as a vague art, at best. In a way, there's almost a sense of relief that our field, psychiatry, can be objectified enough" to allow diagnosis "without emotional or personal biases." The president of the North Haven company formed to market the program, Dr. Geoff V. Gray, said PsychPro can be one tool in helping to control health care costs as well as maintaining quality of medical care. 'Extravagant Variation' Dr. Gray said one recent study of standardization of care asked a panel of psychiatrists to report how they would treat the patients in 25 specific situations. "The agreement was barely higher than pure chance," he said. "There's an extravagant variation in treatments." Dr. Michael Bihari is chief medical officer of MD Health Plan, a health maintenance organization that has been conducting clinical trials of the computer program for 10 months. He said that "utilization review" software is already used in other fields of medicine. "Psychiatry has come to this kind of technology a little later than surgery or general medicine," he said. "But that's not surprising because psychiatry is not always that clear cut." Dr. Bihari said the organization's costs for inpatient psychiatric care have dropped more than 70 percent. And it's not just a matter of cost control, he said. Inpatient care disrupts a person's life, taking them away from work and family and can make someone dependent on hospitalization as a way of coping with crises. "So besides reducing cost, it will improve quality," Dr. Bihari said. "Subscribers will be getting the correct level of care. People shouldn't be in a hospital if they don't need it." While insurance companies and employers might appreciate the cost implications of PsychPro, it remains to be seen how doctors will react. Theodore Zanker, a New Haven psychiatrist and president-elect of the Connecticut State Medical Society, said he expected some doctors would oppose something like PsychPro. "You can program a great deal of information about psychiatry into a computer -- whether it makes any sense once you're done is another question," he said. He said his chief concern was that insurance companies would use programs like PsychPro as another reason for denying or reducing payments to doctors. "It can take a few days, in psychiatry, to let the smoke clear and figure out what's really going on," Dr. Zanker said. "It takes 4 to 21 days to respond to antidepressants, for instance, but every two days you get a call from the managed care company. It's as if they think that by harassing you they can make the drug work faster." "I'm not sure psychiatry is as much art as people make it out to be. Theoretically, it should be possible to compress it into computerized profiles. The question is, does this one do that?" Dr. Zanker said. "They believe they are developing a more rational system, and I'm certainly willing to keep an open mind, but I haven't had sufficient experience with the program to say whether that's true, and I don't know of any psychiatrists who have." The president of the Connecticut Psychiatric Society, Dr. Ellen R. Fischbein, said the society has not taken an official stand on PsychPro yet. "I think everybody is hesitant to say anything about something that's new, because no one knows how it's going to work," she said. Dr. Glazer said he was prompted to develop the program because there is so much variation in psychiatric treatment. For instance, patients are 10 to 15 times more likely to be treated in a hospital if they are covered under an indemnity plan that covers all costs instead of a health maintenance organization that does reviews of care. The company assembled a panel of leading psychiatrists from around New England that reviewed more than 500 hypothetical cases and came up with appropriate levels of treatment for 243 profiles. The computer uses artificial intelligence to ask questions that help it decide which of the 243 profiles are appropriate to a case. The program considers five elements: dangerous behavior, the doctor's opinion about imminent danger, social performance of the patient, social resources available to the patient, and whether the patient has been using drugs or alcohol and is in danger of withdrawal. Dr. Gray said other psychiatric review programs were unidimensional, which means they consider only one element. "There are other dimensions we could have used," Dr. Gray said. "We chose the dimensions we felt were the most important, but I think over time the program will change." The computer program will suggest one of six levels of care, ranging from standard outpatient treatment to hospitalization. In between are options like six or more hours a day of treatment in a hospital setting, or 23 to 72 hours in a hospital. Dr. Bihari said doctors in the MD Health Plan system have accepted the program because their opinions are part of the decision-making process, and because decisions can be appealed. "The computer never makes the final decision," Dr. Bihari said. "The computer is only a guide; it comes up with a recommendation. The final decision is made by health care workers." "Sometimes the physician just wants to put a patient in the hospital because it's more convenient," he said, "and sometimes there's a legitimate reason for wanting hospitalization even when it's not indicated after using PsychPro. Those decisions will be made on a case-by-case basis." The Clinical Trials MD Health Plan's clinical trials involved nearly 200 psychiatrists, 15 hospitals, and an average of 61,383 members. From November 1991 to March 1992 the plan averaged about 64 days of hospitalization on just over 6 admissions per 1,000 subscribers. During the first six months of using the computer program , the rate dropped to 30 days of hospitalization on fewer than 3 admissions per 1,000 subscribers. Fewer patients being admitted to the hospital does not mean care will suffer, doctors said. Dr. Glazer said research has shown outpatient care works at least as well and in some cases better for psychiatric care, with lower relapse rates, better readjustment to work, and fewer subsequent hospital stays. For now, the program is loaded on the mainframe computer at MD Health Plan, and doctors must call to review a case through the program, but eventually it will be distributed to doctors to use on personal computers in their offices. But doctors will always be required to put information into the plan's computer on the treatment they choose, and its outcome, because an important part of the program is the feedback it receives, said Dr. Glazer. As the computer reviews relapse rates and other indicators, it will recognize the effectiveness of certain treatments in certain situations, and modify its guidelines. "This system continues to learn," Dr. Glazer said. "And the more it's used the faster it will learn." Load-Date: June 13, 1993 End of Document What's On Today The New York Times

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scientists, taking clues from how the brain works, are developing new kinds of computers that seem to have the uncanny ability to learn by themselves. The new systems offer hope of being able to perform tasks such as recognizing objects and understanding speech that have so far stymied conventional computers. Moreover, with the ability to learn by themselves, such machines would not require the laborious programming of rules and procedures that is now required to allow computers to work. The new computers are called neural networks because they contain units that function roughly like the intricate network of neurons in the brain. Early experimental systems, some of them eerily human-like, are inspiring predictions of amazing advances. ''I'm convinced that this will be the next large-scale computer revolution,'' said Pentti Kanerva of the Research Institute for Advanced Computer Science in Mountain View, Calif., run by a consortium of universities. But he and other experts note that the technology is still in its infancy and there are many obstacles to surmount. Among the recent developments are these: \* At Johns Hopkins University Terrence Sejnowski developed a program that teaches itself to read out loud. The system is given no rules about how letters are to be pronounced; its errors are merely corrected. At first, the talk is mere gibberish. After a while it begins to utter some baby-like sounds as it learns to distinguish between consonants and vowels. After a night of computing, it reads with few mistakes. \* At Avco Financial Services in Irvine, Calif. a neural network learned how to evaluate loan applications after being fed data on 10,000 past loans. One test showed that had the neural system been used in place of the company's existing computerized evaluation system, it would have increased profits 27 percent. \* At Los Alamos National Laboratory, researchers used a neural network to predict whether particular DNA sequences represented genetic codes for the manufacture of proteins. The network seemed to work with greater than 80 percent accuracy, better than conventional statistical techniques. In each of these cases, a computer was ''trained'' with a set of tasks or problems and a set of correct answers. As it completed each task, it compared its results with the correct answers. When it was wrong, it altered its own program and tried again. Gradually, it ''learned'' the right approach. Up to a point, the more the computer is ''trained'' the more accurate it gets. But no one can tell at the outset how long the training may take. Lured by the promise of this technology, universities and electronics companies like TRW, I.B.M. and A.T.&T. are pursuing work on such computer systems. And more than two dozen small neural network companies have been formed, mainly in the last two years, according to Intelligence, a New York newsletter that follows the field. The Defense Department, too, is considering a big increase in funding for such work. Such neural nets might find use in systems that analyze sonar data, in tanks that can steer by themselves and in weapons that can pick out their own targets. When the Defense Advanced Research Projects Agency sought proposals for neural network research recently, it was besieged by 264 proposals. While computers have always been likened to ''electronic brains,'' a conventional computer is far different from a brain. A computer has a single processor acting on meticulously programmed instructions. It breaks a task into tiny components and performs them in sequence, very rapidly. The brain has billions of neurons, each of which is connected to thousands of other neurons, and they operate in concert. The power of the brain comes from their sheer numbers and their multiple interconnections. Scientists tried to build brain-like computers in the 1950's and 1960's. Frank Rosenblatt, a Cornell scientist, designed a simple neural computer known as the perceptron. But the neural devices of those days had severe limitations. Marvin Minsky and Seymour Papert of M.I.T., two giants in the field of artificial intelligence, wrote an influential book called ''Perceptrons'' in 1969 that pointed out many of those limitations and helped diminish interest in the field. The quest to make computers ''think'' turned instead to artificial intelligence, which involves programming rules into a computer for performing tasks such as reading aloud or making medical diagnoses. A rule for reading out loud, for instance, might be to pronounce a ''k'' except when it is followed by an ''n,'' in which case it is silent. Devising such rules - and their exceptions - and entering them into a computer can take years. Artificial intelligence has had many successes, but has had trouble with tasks like vision and speech recognition for which rules are hard to specify. But the brain handles such tasks effortlessly. Recent improvements in neural networks - added sophistication and subtlety of analysis - have sharpened computers' ability to discern and absorb information, and the connectionists, as the adherents of neural nets are known, are again ascending. Among the those responsible for the revival are David Rumelhart, now of Stanford; John Hopfield of Caltech and Stephen Grossberg of Boston University. Nodes Connected to Nodes Neural networks generally consist of many processing units or nodes analogous to neurons, the nerve cells in the brain that receive and transmit electro-chemical signals. Each of the nodes is connected to many others; the strength of the connections varies. Each node also has an energy level, known as its activation level, which also changes. When the activation level of a node reaches a certain minimum value, that node transmits a signal to the other nodes to which it is connected. The strength of the signal is a product of the activation level and the strength of the connection. If, for instance, on a scale of 0 to 1 a unit has an activation level of .9 and the strength of its connection to another unit is .3, it will send an input of .27 to that other unit. This second unit will be receiving similar inputs from many other units. Its total activation will be the sum of all those inputs. If the second unit's activation exceeds a certain threshold, it will in turn send out a signal that will serve as inputs to other processing units. A simple network might consist of two layers of processing units designed to recognize letters. The units in the first layer represent different features of letters, such as a horizontal line on the bottom or a vertical line on the left. Each of these feature units is connected to each of the 26 units in the second layer which represent the letters of the alphabet. If a letter is presented to the computer that has a horizontal line at the bottom, the unit representing the horizontal line feature will be activated. That in turn will very strongly activate the units for letters like L and E. It will less strongly activate the units for letters like B or C, that have something resembling a horizontal line at the bottom. It will tend to depress the activation of units such as P and H, because those letters don't have lines at the bottom. At the same time, the network is also sending activations for other features. If the unit for a loop at the top of the letter is activated, it will strongly help activate units for such letters B, P and R and help deactivate some letters like L and I. All the features of a letter to be identified are fed through the network simultaneously and the letter with the highest activation is chosen. Learning by Trial and Error In this example, the weights were set in advance by the designer of the network. But networks can also learn by trial and error. One can input features for a certain letter and see what the network says the letter is. If the answer is wrong, the responsibility for the error is apportioned to the different connections using a mathematical formula the machine has been given, and the weights on the connections are changed. Gradually, after several hundred or several thousand trials, the weights will be adjusted so that they produce the correct answer most of the time. Far more powerful networks can be made by adding extra layers of units between the input and the output. These extra units help to extract features from the raw data. In letter recognition, a computer normally would not know at first that the letter had a horizontal line at the bottom or loop at the top. Its field of vision would be divided into a grid and it would merely know which points in the grid were dark and which were light. Those would be the input units for the network. One unit, for instance, might be strongly activated if all the dots on the bottom row of the grid were dark, indicating a horizontal line. When some but not all of the dots in the bottom row in the grid are activated, this unit would still be activated, though less strongly. Such a network can thus recognize letters that are slightly distorted or shifted in position. Taking Part in a 'Grand Event' Amazingly, ''intelligence'' seems to arise spontaneously, not from a grand design, but from the collective action of neurons that in themselves do simple things, just as the way trillions of molecules, each colliding with its neighbors, can create air patterns we call weather. ''The individual players have no idea of the grand event of which they are taking part,'' said Dr. Hopfield, who heads of the program in computation and neural systems at Caltech. Another interesting property is that information and knowledge in a neural network are represented not in any particular place in the memory, as in a conventional computer, but in the pattern of connections between the neurons. For example, there would be no particular node containing information about what the letter B looks like. This means that if a single node breaks down, the system still retains the much of the ability to reconstruct its information. That is why brains continue to function even as brain cells die. This also means that an entire pattern can be recognized from just a piece of it, or from a pattern that is slightly different. People, for instance, can recognize a friend by one or two features of his face. While neural nets function in a greatly simplified version of the way the brain works, the properties they exhibit are now helping in understanding the brain. They are also intensifying a long-running debate on whether people learn by applying rules or merely by accumulating experiences. But some scientists question whether these machines are really ''learning'' at all. ''The neural network is just doing a good job of statistics,'' said Alan Lapedes of Los Alamos. Networks Have Weaknesses There are drawbacks to neural nets. Designing a proper network is still a somewhat mysterious process. And since the networks do not rely on programmed rules they do not show how they arrive at their answers. That could make people reluctant to trust them. Neural networks are not good at tasks that require precise answers; they deal in rough estimates rather than in exact calculations. ''I would not want one of those things balancing my checkbook,'' said James A. Anderson, a professor at Brown University. So far, even proponents say, neural nets have not done anything that has not already been done by conventional computers. Most of the problems solved by neural nets are simple ones, and some researchers suspect the systems will not be able to handle more complex problems. ''There are things they can't do and they haven't run into them yet,'' said Professor Minsky of M.I.T., who is updating and reprinting his book on perceptrons because of the resurgence of interest in the field. One thing they can't do, he said, is count. Similarly, a person seeing a forest cannot immediately say how many leaves are in view because it is impossible to count in parallel. But people can switch into a sequential mode and count the leaves, one after another. Indeed, Dr. Minsky said, the brain seems to be made up not of one network but of many specialized ones that can call one another into play. Combining Computers That suggests that neural nets will eventually be linked to more conventional computers, with each handling the tasks to which they are best suited. Ten years from now, most computers ''are going to have attached neurocomputers,'' predicted Robert Hecht-Nielsen, chairman of Hecht-Nielsen Neurocomputer Corporation in San Diego. Numerous companies are beginning commercialization. Nestor, Inc., based in Providence, R.I., is selling neural systems for recognizing handwriting and the printed numbers on bank checks. Many other small companies, like Hecht-Nielsen, are selling software or computer circuit boards that help others experiment with neural networks. Currently, neural networks generally do not exist as special machines. They are merely simulations run on conventional computers. Building actual networks might be difficult. The wiring job involved in connecting hundreds of processors to hundreds of others would be a nightmare. But several companies, ranging from the American Telephone and Telegraph Company's Bell Laboratories to startup Synaptics Inc. in San Jose are designing special chips for such computers. Others suggest that optical computing might be a solution because light beams can cross paths without interfering with one another. Groups led by Demetri Psaltis at Caltech and Dana Anderson at the University of Colorado have built optical associative memories. When they are shown part of a pattern, the memories retrieve the entire pattern. The Colorado system seems to have a mind of its own. When it is not presented with any pattern, it displays random patterns. The researchers call this behavior ''daydreaming.'' Graphic diagram End of Document Pentagon Research Director Visits Universities in Bid to Re-energize Partnerships The New York Times

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day, millions of travelers research fares and hundreds of thousands buy airline tickets over the Internet, sometimes with just a few clicks of the mouse. They could be forgiven for not knowing that air-fare searching is an astonishingly complex computer task -- or that it took a small software company, founded a few years ago by a procrastinating graduate student at the Massachusetts Institute of Technology, to help simplify the process. The company, ITA Software of Cambridge, Mass., had revenue of only $10 million last year for licensing its technology to the airlines -- less than the amount of tickets the airline industry sells online in a day. But ITA is a catalyst of a major change that has been reshaping airline reservations technology -- away from outdated and expensive mainframe computer systems and toward inexpensive desktop computers that, hooked together, can deliver vast amounts of computing power. "ITA is a good example of how someone coming from outside the industry with no agenda is able to help the industry rewrite its future," said Henry H. Harteveldt, a senior analyst at Forrester Research, a technology consulting company. The founder of ITA, Jeremy Wertheimer, said that the company began as what he half-jokingly called a "thesis avoidance project." Mr. Wertheimer, 40, was a graduate student in artificial intelligence at M.I.T. in the early 1990's when he became interested in air-fare searching -- a classic computer science problem. A single round-trip can have hundreds of millions of fare combinations. Fares have a range of variables: the array of airlines serving the route, the number of daily flights, connecting flights and dozens of airline rules (things like passenger eligibility, seasonal restrictions and advance-purchase requirements). International trips have even more possibilities. "It's unfathomably complex," Mr. Wertheimer said. Intrigued by how computers could wade through so much information to search for the cheapest fares quickly, he developed a demonstration program using Lisp, an artificial intelligence language that allows enormous quantities of data to be manipulated on a desktop computer. That program became the basis for ITA, which Mr. Wertheimer founded with friends in 1996. Other, bigger companies have created rival systems. Expedia, the travel booking Web site started by Microsoft, has developed a fare-search technology that runs on Windows NT servers. Sabre, whose reservations technology powers the Travelocity site, is developing a desktop platform to replace its mainframe system, which American Airlines and I.B.M. introduced in 1964. Only recently have mainframes begun to lose favor in the airline industry. In the 1990's, when Mr. Wertheimer first researched fare searches, many airlines and travel agents still used systems developed in the 1950's. "I was sort of in awe because they were solving a very hard problem, and they didn't have the tools for it," Mr. Wertheimer said. Alex Zoghlin, chief technology officer of Orbitz, a travel Web site started last spring by a consortium of airlines, attributed the relative backwardness of reservations technology until recently to the airline industry's reluctance to invest in it. The assumption, he said, had been that "the cost and effort were so high, it created a barrier to entry." Orbitz uses ITA's software. Mainframe reservation systems can list fares for only a narrow parameter specified by the user -- say flights between Boston and Los Angeles at noon on a certain day. The user must screen the list generated by the mainframe to find the cheapest fares; if the user wants to know if there are cheaper fares at 9 a.m. or 2 p.m. that day, another mainframe search must be generated. Moreover, mainframe fare searches return only about 10 choices. For some routes, Mr. Wertheimer noted, that number wouldn't even cover all of nonstop flights available. For people outside major cities, nonstop flights are rarely available, and the variations in choices can be vast. "The thing that bothered me was that you had to make a lot of decisions before you could see a price," Mr. Wertheimer said, referring to the frustration of conducting many incrementally different searches to find the cheapest fares for one trip. Mr. Wertheimer wanted to create a computerized search that would return the best answers for a much wider range of variables chosen by the user -- for instance the lowest fares in a 24-hour period. "It's an interesting problem in that there's not one best answer," Mr. Wertheimer said. "Maybe the flight you want costs $206 through Fargo, but only $212 nonstop. Or for another $20, you could fly on an airline you like and collect frequent-flier miles. Or if you're flexible about the time of day, you could save $50." ITA's software is designed to take into account a full day's schedule, regional airports near a selected destination, possible connecting flights and other factors, and then to return about 400 results sorted by price, flight duration, departure times and airline. The user can change the search parameters or the way results are displayed, then decide if he or she wants to make trade-offs -- perhaps an earlier departure or extra connection to get a lower fare. SUCH consumer-centered programming has become more important in the industry as travelers buy more tickets online. Forrester Research estimates that consumers bought $9.1 billion of leisure air travel tickets online in 2001, or 10 percent of total passenger revenue for the year. The company projects $13.2 billion in online sales for 2002, growing to 14 percent of total passenger revenue, and $16.2 billion in sales for 2003, or 16.5 percent of the total. Mainframe computers and software cannot support thousands of simultaneous searches in addition to sales (which result from only a small fraction of the searches on travel Web sites). ITA's software, and Expedia's, run on networks of inexpensive desktop computers that can be expanded easily. Visitors to www.itasoftware.com, ITA's Web site, can try the software, but it can show only fares -- users cannot use the ITA site to book reservations. ITA's primary business is licensing software and selling services to airlines, companies that run reservation systems, travel agents and other industry groups. Travelers are most likely to encounter the system on Orbitz, a flight booking Web site founded last spring by American, Continental, Delta, Northwest and United airlines. ITA said its searches would always return the lowest published fares available, but Orbitz, Expedia and Travelocity all have private deals with airlines, and for any given search a competing site may have a better fare. Expedia also offers air-fare packages with rental cars and hotels. ITA, which originally stood for Internet Travel Agency, was initially capitalized with money from Mr. Wertheimer's father, Nathan, a jewelry manufacturer, and its first employees. In 1998, with a staff of only five, including Mr. Wertheimer, ITA landed its first deal, with Amadeus, the primary airline reservation system in Europe. Orbitz signed in 2000. With market evidence that its software worked, and a burgeoning interest among airlines in Internet bookings, ITA found it easier to attract customers. In 2001, Delta Air Lines and SITA, an international fare-pricing organization, signed deals with ITA. America West is expected to announce a partnership with it in June. With each contract, ITA has hired 10 people; it now has a staff of 45. But the company found that once it exhausted its network of programmers in the research field, it had difficulty finding qualified people. Since last November, ITA has run a banner ad on Slashdot, a Web site that bills itself as "News for Nerds." That banner, and one on Freshmeat, a Slashdot affiliate, challenge readers to solve difficult programming puzzles. The ads have drawn nearly three million hits, and about 200 people have submitted answers, half of them correct. ITA has brought on three employees through this process and seven more through personal connections and postings on HotJobs. Mr. Wertheimer said he was confident that he had hired great people, but he was cautious about growing too fast. "Hiring is still one of the more nerve-racking things," he said. Still, ITA is growing, and Mr. Wertheimer said he saw opportunities in several areas. Within the airline industry, ITA software can be applied to help determine schedules and routes, for example. ITA could also apply its systems to tasks in other industries, like scheduling advertising in broadcast media. "A lot of people have offered to buy us," he said, without being specific. "But we've turned them down because we can do a lot more here." Boston to Los Angeles: 800 Million Fare Choices AN air fare reflects a combination of things: airline, airport of origin, destination and applicable rules. In theory, there are immeasurable combinations, because a traveler could fly, say, from Boston to Los Angeles via London. To set fares that might interest an average traveler, however, it is usually enough for a computer to search for the 400 most direct round trips. Even finding those requires sifting through hundreds of millions of possibilities. Here are the choices for Boston-Los Angeles round trips as ITA software seeks fares for nonstop and one-stop flights, leaving May 16 and returning May 23, with a 24-hour window for departures both days: \* The 400 possible outbound trips are multiplied by the 400 possible return trips , which equals 160,000 unique round-trip itineraries. \* For each round trip, there may be up to four legs (Boston to connecting city, connecting city to Los Angeles, and the reverse), and each represents a flight. Once rules and classes (economy, business, first class) are applied, each flight has about 30 fares. The number of fare combinations is thus 30 times 30 times 30 times 30, which equals 810,000. \* Of that 810,000, only about 5,000 typically pass the rules for a given route and passenger (special fares for the elderly, for example, or companion fares). \* The final numbers, then, are: 160,000 itineraries times 5,000 fares -- or 800 million possible fare combinations. The cheapest round-trip fare found by ITA's system early this month was $309.50 on United, with nonstops both ways. SARAH MILSTEIN http : // www.nytimes.com Graphic Photo: Jeremy Wertheimer and his company, ITA Software, are streamlining online searches for airline fares. (Rick Friedman for The New York Times) Load-Date: April 21, 2002 End of Document How Driverless Cars Could Reshape Cities The New York Times

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house lights dimmed at the BTI Center for the Performing Arts in Raleigh, N.C., one night last month, the stage lights came up on the grand piano, and in front of a rapt audience Alfred Cortot played Chopin's Prelude in G (Op. 28, No. 3), as he had not for nearly 80 years. Cortot is dead, of course. He was not present in physical form, nor was anyone else sitting at the keyboard of the Yamaha Disklavier Pro as the keys rose and fell. But this was his performance come back to life: his gentle touch, his luminosity, even his mistakes, like the light brush of an extra note at the periphery of the final chord. So, at least, claimed Dr. John Q. Walker, the president of Zenph Studios in Raleigh, which sponsored the event and created the software that allowed Cortot to return. Dr. Walker is developing technology that enables him to break down the sounds of an old recording, digitize them and reproduce them on a Disklavier, an up-to-the-minute player piano that can record and replay performances by means of a CD in a slot above the keyboard. Sophisticated fiber optics control the instrument's hammers. Old recordings of great performers are often marred by scratches and surface noise, or by sound badly filtered through primitive microphones. Dr. Walker is offering the same music with the immediacy of live performance and the acoustical advantages of a contemporary piano. To demonstrate the contrast, Dr. Walker also let the audience at the BTI Center hear the original Cortot recording from 1926, which sounds as if sand had been poured on the old disc's shellac. ''The farther you get from the recordings, the worse they sound,'' Dr. Walker said by phone a few days before the concert. ''The fundamental root of the problem is that I don't want to hear a recording. I want to hear the young Horowitz, Schnabel, Fats Waller, Thelonious Monk on an in-tune piano.'' If the claims he is making for his new technology are accurate, he will soon be able to. His plan is to approach the major labels with his software and delve into their back catalogs, acting as a record producer to make old recordings new. Josef Hoffman without the scratches, Glenn Gould without the mumbling: brought back to life and performing on modern pianos, recorded with modern technology. ''People say this is like colorizing old photographs, but it's not,'' Dr. Walker said. ''This process is like being able to set up the entire scene of that photograph again and shoot it with a new camera from any angle, forever.'' This is the new world of computer music. In its infancy, way back in the 1960's, the goal was to use digital technology to create new sounds and new musical forms. Today scientists around the world are turning computers on human performance, seeking to quantify an element once thought to be intangible: the expressivity of a human artist. The piano is a good place to start. It offers a relatively limited set of variables. With the violin, every aspect of sound production is subject to human vagaries: bow pressure, bow speed, the placement of the fingers. On the piano, it comes down to hammers hitting strings. Developed by Wayne Stahnke, the first Disklaviers were made in the 1980's by Bosendorfer, the renowned Viennese piano manufacturer. When that company stopped making them, Yamaha took up the baton, hiring Mr. Stahnke as a consultant. Mr. Stahnke's best-known Disklavier project was a foretaste of Dr. Walker's efforts: translations of piano rolls recorded by Sergei Rachmaninoff. The two resulting CD's of ''new'' Rachmaninoff performances, both called ''A Window in Time'' and released in 1998 and 1999, are still available from Telarc. Some listeners find these revelatory. Some find them mechanical, even soulless. The reactions demonstrate a basic difficulty with mechanical reproduction of music: there is a subjective element involved in determining if it works. The final criterion for any such reproduction is the rather imprecise ''Turing test'' of artificial intelligence: that is, whether it can make the listener think he or she is hearing a person rather than a machine. At the Austrian Research Institute for Artificial Intelligence, a group of leading researchers known as the Machine Learning, Data Mining and Intelligent Music Processing Group are trying to pinpoint just what it is that fools the ear. Led by Gerhard Widmer, they are looking at everything from improving the way computers ''hear'' music to isolating the elements of individual performance style, as well as creating graphs and animations to illustrate different pianists' interpretations of the same passage of music. In a 2003 paper, ''In Search of the Horowitz Factor,'' Dr. Widmer and his team described giving the computer 13 recordings of Mozart piano sonatas, played into a Bosendorfer Disklavier by the pianist Roland Batik, to see if they could use the computer to determine rules that described the pianist's interpretive choices. They did get some rules, though it turned out that many of them applied equally well to other performances of other music. But the machine generated its own performance of a Mozart sonata movement that it had not heard Mr. Batik play, but based on what it had learned of his style. With this, it took second prize in the International Computer Piano Performance Rendering Contest in Tokyo in 2002. With no stage fright. ''The first question was, can we hear Glenn Gould play again?'' Dr. Walker said. ''The next question: Cool, can we hear him play other stuff?'' To this, Dr. Widmer might answer: We're getting there. But there's still the thorny matter of how to get data from an audio recording into the computer. It's a question not just of having the computer play back a CD, but of translating the music into a language the computer can understand. A computer, by itself, can't recognize the difference between a note of music and a cough. It can't pick out a melody from a dense weave of counterpoint. It can't tap its foot to follow a beat -- not, at least, in classical music, where the tempos are constantly changing. The first problem Dr. Walker faced was how to get the computer to create a kind of score from the clusters of sounds in a recording. ''A recording is sound waves that were sampled by a microphone,'' he said. ''We feed those into the computer and try to discover what the notes are. The computer model is a three-dimensional thing: middle C struck in a certain way looks like a 3-D mountain range. We have a model that looks like math equations, and we try to fit to it: Yeah, this looks like it's a note.'' Dr. Walker -- a trained pianist with a degree in software engineering who sold his company a few years ago, creating the time and financial flexibility to work on this project -- is coming up with his own answers. But the process is still extremely time-consuming. He is reluctant to say just how slow it is, but he has been working for more than three years, and his demo CD includes only a few tracks: the Cortot, Glenn Gould's performance of the Aria and first variation of Bach's ''Goldberg'' Variations, and part of a track by Art Tatum. Even after he gets a model that works, Dr. Walker has to contend with the question of reproduction on a Disklavier: can it mimic human performance down to the last detail? Dr. Werner Goebl, a member of Dr. Widmer's team in Vienna, addressed this as co-author of a paper called ''Are Computer-Controlled Pianos a Reliable Tool in Music Performance Research? Recording and Reproduction Precision of a Yamaha Disklavier Grand Piano.'' Precisely measuring the Disklavier's ability to replicate human touch, Dr. Goebl answered his own question: No. Less high-tech but just as relevant are the variations from one piano to another. A skilled musician compensates for changes in a room or an instrument. A CD cannot. Dr. Walker encountered one aspect of the problem when he took his technology to the Yamaha studios to play his Cortot performance for Mei-Ting Sun, a young concert pianist and the winner of the first Piano-e-Competition in 2002 (judged, in part, via a Disklavier in Japan, which reproduced performances thousands of miles away for one of the judges). It had to do with the final chord in the Chopin prelude -- or, rather, with the extra, wrong note. ''Their piano wasn't calibrating as ours was,'' Dr. Walker said, ''and the note didn't sound. Mei-Ting said: 'I know this recording. This wasn't accurate, because Cortot misses the last chord.' I played it again, and he watched the keyboard and saw that the key went down but didn't sound. He said, 'O.K., you guys got it.''' Mr. Sun was so convinced that at the North Carolina concert where Dr. Walker's version of Cortot made his debut, he appeared as the featured live artist: Cortot played a piece, Glenn Gould played a piece, and Mr. Sun played the rest of the evening. He had to; Dr. Walker didn't have enough music to fill a whole recital. The technology, in short, is still in its infancy. But Dr. Walker is animated by his vision of the future. Like other scientists -- including Dr. Goebl in Vienna, another serious classical musician -- he envisions a future of interactive recordings. ''We've been trained that a recording is a frozen document,'' he said. ''Why can't it be like a video game -- every time you hear a recorded performance it's different?'' But at the moment, his focus is on making new recordings in a more conventional manner. Dr. Goebl, in Vienna, supports Dr. Walker's work and is interested in it. But he questions whether it's a ''real'' performance. (Dr. Walker is well aware of such skepticism; his response is simply that you can't judge until you've heard it.) ''The timing you can probably get quite right,'' Dr. Goebl said. ''What is really difficult is to get how long the notes were held and how the pedal was moved and so on. You don't have that information. You can just guess. The result is something that sounds like but never truly will be Gould. It's always an approximation.'' So is he saying that Dr. Walker's track isn't authentic? ''There you have to go into the philosophical domain,'' Dr. Goebl replied. ''A recording is just an acoustic document of what took place.'' In other words, a recording isn't authentic, either. It is also at a remove, or two or three, from the original performer, and it is also affected by the decisions of the engineers who helped create it. The Gould recording, after all, wasn't recorded in one take. Many different takes were spliced together to create it. Is it any more real than a computer replica? Only if you say it is. http : // www.nytimes.com Graphic Photos: Technicians checking the sensor boards on a Yamaha grand piano during a break at the first Piano-e-Competition, in 2002. The competition, held in St. Paul, was judged in part via a Disklavier in Japan. (Photo by Dawn Villella) Born again: the late pianist Alfred Cortot. (Photo by Edmund Joaillier/Getty Images)(pg. 29) (Photo by Margaret Riegel)(pg. 1) Load-Date: June 5, 2005 End of Document Genetic Engineers Who Don't Just Tinker The New York Times

Time: 16/07/2004  
are now involved in many of life's chores and amusements. Should you let them find your soul mate? At AT&T Labs in New Jersey, the Media Laboratory at the Massachusetts Institute of Technology and other research centers, scientists have devised programs to look for online matches that can enhance your business or social life. Like a good flesh-and-blood matchmaker, each of these programs takes a close look at its user. The software does a statistical analysis of the seeker's interests or communication style, then sallies forth in search of someone who appears to be compatible. The difference is that these matchmakers begin their searches on the Internet. Matchmaking programs are part of a group of personalized software that scientists call robots, software agents or softbots. The first generation of these agents offered to introduce people to new books (as on Amazon.com), schedule a meeting of six busy people, fetch the lowest price for a refrigerator advertised on the Web or suggest items for purchase. The newest generation of software agents includes robots that are prepared to perform business and social introductions to ease the paths of people venturing into the salon that is the Internet. There is no cyberversion of Madame de Stael and her French salon of the late 18th and early 19th centuries just yet. But there is Yenta at M.I.T. and Cobot at AT&T Labs, two examples of matchmaking software developed to make business and social introductions among like-minded people on the Internet. "We are really trying to use software agents that are considerably different from those before," said Michael Kearns, the department head for artificial intelligence research at AT&T Labs and a co-developer of Cobot. "Instead of tasks like coordinating calendars, these software agents will step out and take much more initiative, making social introductions, not a task people have traditionally thought of machines as being good for." The idea of software agents that communicate with one another on the Internet and exchange Internet addresses so that their owners can meet sounds more like science fiction than fact. And even though the robots' creators have designed them to keep private information private, the creation of such multi-agent networks is sure to raise worrisome questions of privacy. One of the software agents, Yenta, named after a Yiddish word for a woman who gossips, is designed to introduce its users to other like-minded people at no cost to privacy. Yenta's creator, Leonard Foner, said: "My software agent was developed expressly to show that you could have a matchmaking system and still protect your privacy. Yenta is basically a tool to help busy people find other people with common interests." Dr. Foner developed Yenta for his doctoral project at the M.I.T. Media Lab and is a member of the software agents group there. Dr. Foner created Yenta with business and research, not romance, in mind. "Suppose you are a researcher working on a problem you haven't published, and someone else is working on it, too," Dr. Foner said. "Your Yenta and his Yenta could bring you together." British Telecommunications in Ipswich, England, took Yenta from the M.I.T. Media Lab and adapted it for a trial run in its personal agent system at many company sites. It is currently being used by 1,300 employees to build business relationships within the company. "It's turning out to be a good way for people with similar interests within the company to get in touch with one another," said Barry Crabtree, a research engineer and technical adviser who oversaw the adaptation. "People are delighted to find others with common interests." The Yenta software agent can be downloaded free by following the links at yenta.www.media.mit.edu/projects/Yenta. (It runs only with Unix for now, but Dr. Foner is considering a Windows version.) The Yenta software immediately tells Dr. Foner's server the recipient's I.P. address so that other copies of Yenta can communicate with it. "The server records no personal information except that a Yenta ran on a certain machine sometime in the past," Dr. Foner said. "Otherwise, it is completely anonymous." Users can then point their copy of Yenta at selected computer files and turn it loose. To analyze files, the robot counts the number of times words occur in documents, like "agent" or "hockey" or "Flaubert," and summarizes the information. Using that summary, the robot identifies clusters of documents that use the same words. "Soon you have clumps of word lists that are mostly talking about the same subject," Dr. Foner said. For instance, the user's copy of Yenta may find that in a group of 24 documents, all share the same top five keywords, like "robot," "collaborative," "filter," "Yenta" and "results." The users can direct their Yentas to eliminate any clusters in which they are not interested. Yenta is then ready to go out and find other copies of Yenta that have identified clusters of documents that share the same top keywords. The software is concerned only with how often keywords appear, not with context. When a Yenta spots a match, it tells the user it has identified a cluster of other Yentas that share that user's interests. "All really close matches get notification from their respective Yentas that they should talk to one another," Dr. Foner said. All communication between users takes place through the Yenta software. E-mail addresses and identities are not shared unless the users decide to share them. To get started on its collaborative life, the software can ask Dr. Foner's server for the addresses of a random handful of Yenta copies around the world. Within an intranet, the Yenta can simply send out a general call. "If you are in a company or in any network that supports local broadcasts, including most types of Ethernets, you can broadcast internally to see if there are other Yentas," Dr. Foner said. The network of Yentas spreads as Yenta A asks Yenta B: "Do you know more Yentas? Can you give me their I.P. addresses?" As the Yenta copies communicate with one another, passing messages and arranging introductions, all communications are encrypted, including the files that each Yenta stores on the computer's hard disk to keep track of its user's interests. About 100 people signed up for the original testing of Yenta; a smaller number are still interacting, Dr. Foner said, while he is preparing an updated version. British Telecom continues to adapt Yenta for its own use, and Intel has also licensed the software. Paul B. Anders, a senior engineering researcher at Intel, said, "Intel is looking at several knowledge management tools, like Yenta, that match experts to problems." If Yenta is the office gossip, a new softbot called Cobot is more of a sociologist. Instead of looking through e-mail messages and talking to Web browsers, Cobot analyses transcripts of user interactions from a chat room in LamdaMOO, an online community that was created in 1990 at Xerox's PARC laboratory and is still popular among computer programmers. "Cobot sits around in the living room -- the center of social activity in LamdaMOO," said Dr. Kearns, who developed Cobot with Charles Isbell. "It builds up a statistical profile of how people in the room communicate." LamdaMOO lends itself to artificial intelligence experiments, Dr. Kearns said. "Unlike commercial chat rooms, LamdaMOO provides you with other ways to communicate besides directed speech, ways that let you express nonverbal communications," Dr. Kearns said. For instance, he explained, if he sees someone he knows in the chat room, he can type "hug Kim" instead of "hello." Kim will see "Michael hugs you," and other people will see "Michael hugs Kim." Using other simple commands, users can signal many emotions, like shrugging or laughing. "With communication this rich," Dr. Kearns said, "it's really possible for people to start to exhibit a communicative style and personality. Some people laugh more or speak more, and it's possible to statistically measure these styles." To observe these styles and to determine, for example, which chat room contributors are aggressive, which ones like to hug and which ones are skeptical, Cobot was placed in the LamdaMOO living room last year. It is arbitrarily considered male because LamdaMoo participants usually declare whether they are male or female and Cobot's inventors wanted him to fit in. So far, Cobot does not take the initiative in social interactions. Instead, members of the chat room communicate with the robot directly to inquire about their online habits and those of others. At first, few participants spoke to Cobot, but when users discovered that he could provide them with illuminating details about themselves, he became quite popular. "Users were fascinated by their personality profiles -- how often they hugged, for instance, or were hugged," Dr. Kearns said. Cobot was prepared to give them "objective, statistical information about how they behaved in the virtual world," Dr. Kearns said. The analysis is based on things like how much a person scoffs and even harsher details, like: "You rate Mike as your No. 1 friend. Mike rates you No. 8 on his list." To do this, Cobot counts each player's actions and figures out what percentage is directed toward each other player. "In this way, a legitimate social imbalance is uncovered," Dr. Kearns said. Cobot will begin taking a more active role by suggesting, without prompting, that people become acquainted. "Soon Cobot is going to be able to introduce people to one another based on a common friend," Dr. Kearns said. Dr. Kearns and his colleagues also sought to give their softbot a better conversational style. "He began getting an enormous variety of utterances, thousands of interactions a day," Dr. Kearns explained, so instead of trying to write Cobot's responses to queries, the team stocked him with documents like the Unabomber manifesto and the script for "Planet of the Apes." The robot matches the words and phrases directed toward it -- other than requests for a statistic -- with words in its reference documents. When it finds a match, it uses that part of the document to generate a response that gives "the appearance of personality," Dr. Kearns said. The LamdaMOO living room participants liked the newly improved Cobot and chatted with him even more, apparently delighted that he had developed a cranky side. (Don't ask him about the foibles of technology.) To keep Cobot from irritating users by taking the initiative too often or at the wrong moment, "Cobot will get rewards or punishments from the group as he learns," Dr. Kearns said. Cobot will soon be able to notice that two people in the chat living room who are not talking to each other have similar friends. He may decide to introduce them. Some people will like that, Dr. Kearns predicted, and some will not. The users can punish or reward Cobot, and he will quickly learn which users want his help. Cobot is already full of surprises for his creators. Dr. Isbell has been taken aback by the depth of his software agent's education, he said, just as Henry Higgins was startled by his handiwork in "Pygmalion." "Sometimes I ask Cobot about myself, and I discover interesting and annoying things," Dr. Isbell said. "For instance, I asked Cobot, 'Tell me who acts like you.' It turns out that I act like him. I was a little disconcerted by this." http : // www.nytimes.com Graphic Photos: Leonard Foner of M.I.T. created matchmaking software named Yenta. (Evan Richman for The New York Times)(pg. G1); SMART SOFTWARE -- Charles Isbell, left, and Michael Kearns of AT&T Labs wrote Cobot, a softbot that monitors social interactions. (Don Standing for The New York Times)(pg. G7) Load-Date: February 10, 2000 End of Document The Future Is Now? Pretty Soon, at Least The New York Times

Time: 22/04/2001  
18 years ago, a sudden swamp of orders -upwards of 16 million shares a day - forced the nation's major stock exchanges to close every Wednesday, for weeks, to catch up on paperwork. Today, with computers ubiquitous on Wall Street, the New York Stock Exchange alone handles 10 times that trading volume with ease. Now, after two decades of electronic evolution, Wall Street's computers are far more than mere pencil pushers. They have been turned to an array of unexpected uses that have fundamentally changed the world's investment patterns. They have permitted the creation of new financial instruments, including stock index futures and options, now traded heavily every day in Chicago. They have brought volumes of information to investors, often more data than even professional traders can absorb. And, through links to overseas exchanges, they have led to round-the-clock trading, and made it possible to swap funds instantly from equities to futures, and from exchange to exchange. Even the worst computer phobes concede that, by now, the computer is a Wall Street fixture, as a tool -and as a counselor. People who hoped to see the likes of HAL, from the movie ''2001,'' running Wall Street will be disappointed. But there is software on the drawing boards that may help computers not only spew forth data but reason out trading strategies. The use of computers to detect, and sometimes inspire, all kinds of profitable trading opportunities is just the latest example of the way a technology brought in to solve one problem can dramatically change an entire industry. And as in other such cases - the way atomic energy affected electric utilities, or the way the laser has transformed military electronics - the price tag on the progress is only now becoming evident. A growing number of financial experts - to say nothing of jittery small investors - accuse computers of having created a market that is virtually run by machines. And they point to days like Sept. 11, when the Dow Jones industrial average plunged more than 86 points, as proof that such computer-aided approaches as program trading, which involves instantly swapping long lists of stocks, futures and options to take advantage of temporary price disparities, set off wide and chaotic market swings. Proponents of computer-assisted trading say that by allowing investors to act on market-moving news far more quickly and effectively, computers have engendered fairer, more efficient markets. ''By and large the technology just speeds up what people have done before, causing the markets to react much more quickly,'' said William J. Brodsky, president of the Chicago Mercantile Exchange, the main trading place for stock index options and futures. Others note that if the acceleration has created temporary market spasms, more technology may solve that problem, too. The price swings really are rooted in the differing expectations of traders looking at different data, they say, and thus will become far less frequent as financial exchanges across the world become more tightly linked. And even the swings are not entirely negative: There were few complaints when program trading apparently triggered the 31 point rise in the market last Wednesday. Still, there are rising concerns, including some from Federal regulators, that computers may be doing more than accelerating what comes naturally. By making possible instantaneous analyses of a crush of data about short-term market aberrations, a raft of new hardware and software has drawn institutional investors into trading patterns that have little to do with fundamental values of companies or prospects for the economy. And that, in turn, has meant a frenzy of short-term trades that some experts, though hardly all, believe has created significantly more volatility. Along the way, individual investors, already bit players in markets dominated by institutions, are scared away once again: Most cannot devote the time or resources to take advantage of short-term market swings whose causes become ever more mysterious. ''Simply put, the public cannot compete with the professional traders at this stuff,'' said William Silber, a professor of finance at New York University's business school. Even the traders may be overwhelmed, others say. ''All of a sudden, the people doing the analysis are getting more data than they can reasonably assimilate,'' said Warren Pyles, the president of Marketvision, a three-year old company that sells programs that put data into easily digestible graphic form. ''And they are being asked to make faster and faster and more costly decisions. It is a double whammy.'' Imminent developments promise to add even more fuel to the fire. Already more than a few financial professionals, and dozens of software houses, are working to apply artificial intelligence techniques - techniques that enable computers to replicate certain limited forms of human reasoning - to the trading process. The idea is to let the computers themselves make instant, accurate judgments about relative prices of stocks and other financial instruments, involving tradeoffs too complex for even veteran traders to tackle quickly. Whether Wall Street will prove entirely capable of absorbing such technology, much less control its effect, is unclear. The computer's assault on the Street has occurred only gradually, with no grand design. And progress has been dictated, as in so many other industries, not as much by the availability of technology as by the ability of financial professionals to master it for their own purposes. Already, they have sought help. The Street's newest professionals are the ''rocket scientists'' and ''quants'' -oftentimes former academics in the pure sciences of mathematics and physics - who search for new ways to apply the computer to all sorts of problems: creating mortgage-backed securities, minimizing transaction costs, timing the sale of huge volumes of stock to maximize profits. More elusive are ways to quantify less predictable market factors. How, for example, would a program factor in a war in the Middle East or rumors of a big Chapter 11 filing? Still, computer researchers do seem to be making it feasible - if not desirable - to have computers that truly dominate the financial markets. ''The inevitable result,'' said Prof. James Beniger, a University of Southern California expert on computers and control systems, ''is that people will begin to write programs that seek to anticipate the decisions that other computers will suggest. It's just market psychology, one step removed, and one more step away from direct human control.'' Such suggestions anger traders at the brokerages that make the broadest use of computer technology, like Salomon Brothers. ''There is no computer, no program on Wall Street or anywhere else that buys and sells,'' argues Louis I. Margolis, managing director of Salomon Brothers Inc., as he stood in the firm's chaotic trading room the other day. ''Nothing is going to replace human judgment.'' FEW of the computer-assisted trading techniques are new. But in the past, they were never widely practiced, largely because by the time the calculations were done, the market opportunity was long gone. No more. Program traders, usually armed with little more than an I.B.M. PC-AT, a Lotus spreadsheet - and, of course, a huge amount of money to trade with - now can translate theoretical profit opportunities into highly lucrative trades. ''What's different now is volume and speed,'' notes Mr. Brodsky. ''The idea of buying the entire S&P 500 in two minutes, in the right proportions or something that simulates it, is something no one dreamed of before. And that, of course, can change the nature of the market.'' A few individual traders switching funds between equities and stock index futures, or using any of the other program trading techniques, would barely move the market at all. But because profit margins on program trades are usually slim, the program traders must move millions of dollars at a time to make it worthwhile. Thus, the execution of many program trades at once, all seeking to exploit the same opportunity, can create such an impact that the market does not have a chance to self-correct. ''Program trades can have a snowballing effect, and investors can be taken for a rough ride,'' said Jack A. Barbanel, director of futures trading at Gruntal & Co. Inc. in New York. Of course, Mr. Barbanel and others point out, technology by itself is neutral. It is widely available, and its continued wide use is inevitable. But it will always be the users, not the machines, that create the stabilizing or destabilizing effects. ''What fostered all this was the markets themselves, and the growth of derivative instruments: Futures, options, options on futures,'' notes Jay Light, a professor of finance at Harvard Business School. ''That's what created the opportunity that people exploit with the technology.'' Those instruments create innumerable opportunities for arbitrage, which involves trading on differentials in, say, the price of a Standard and Poor's 500 Index futures contract versus the price of underlying 500 stocks. Calculating those differentials in their simplest form can be done on the back of an envelope, without benefit of a glowing screen and fancy software. But by linking computers directly to ''real-time'' information services, traders can have their own positions recalculated instantly -and can be alerted to any opportunity when it might make more sense, for example, to trade equity holdings for future holdings. Simultaneously, there are programs that can work out the most expeditious way to ''hedge'' a portfolio, insuring it against sudden market declines. And there are programs that make it possible to figure out how to minimize transaction costs by selling a relatively small representative group of the S&P 500, or how to unwind a position in some stock without depressing the market. Obviously, as the techniques get more complex, computers become indispensible. ''Arbitrage is basically a mathematical game,'' said Professor Light, ''and thus a game that computers are very good at.'' IT was the need for speed, rather than for mathematical wizardry, that put computers on Wall Street in the first place. By the mid-1960's, when the mainframe computer was first coming of age, it became clear that neither the stock exchanges nor the brokerage houses could keep up with the paper blizzard created by steadily growing trading volume. There were just too many records. There was the paper record of an order, which had to be placed in the hands of a trader on the stock exchange floor. There was the paper record of the sale, including the price. And later there was the paper record of the stock certificate - a particularly difficult problem because of individual investors, whose small orders generated only a fraction of the market volume but a huge portion of the paperwork. On Dec. 20, 1966, the New York Stock Exchange embraced automated record-keeping for the first time. Brokerage houses followed along - some grudgingly, others with enthusiasm - and by the mid-1970's their computers were linked directly to their branch offices at one end, and to the exchanges at the other. Another system put buy and sell orders directly in front of the specialist. If the first generation of financial computer systems kept records, the second spurred business. Salomon Brothers, Merrill Lynch and Goldman Sachs, among others, began compiling lists of which pension funds and companies owned or usually sought specific securities. ''Everyone woke up to the fact that the computer could help them find the other side of any big trade,'' said Professor Silber of NYU. ''The major commodity that investment bankers have is this information.'' In turn, that spawned more block trading, which in its early days was accused of causing many of the same evils -market volatility, squeezing out small investors - now laid to program trading. All the while, analysts, strategists and traders were beginning to think about the third, and equally obvious, use of computing power: Analytics, the use of computers for evaluating new trading opportunities. Clearly, greater processing power could aid stock analysts in predicting the fortunes of individual companies. But computers could also be programmed to evaluate short-term phenomena where the investing choices were not obvious: Whether to put money into securities rather than Treasury bills, when to sell a large market position in a particular stock, how to reduce risk in a specific portfolio. But analytics didn't really flourish on Wall Street until the confluence of three different forces: Faster market information, cheaper computers, and the arrival of software that non-programmers could use. The faster market information came in the form of real-time data systems such as Telerate and Quotron, which made it possible to sit at one desk, anywhere in the world, and scan screens full of up-to-the-minute information on stock prices here and abroad, on Treasury bills, and on futures and options. Now, in a transition still underway, comes the next step: To feed that data directly into desktop computers that actually massage the information rather than just display it. Meanwhile, the raft of programs -starting with Lotus 1-2-3 and working up to far more specialized software for particular trading purposes - allows traders to ask the natural question: ''What if?'' With the press of a button, they can compare the advantages of innumerable investments. Each choice, of course, carries a different transaction cost: It is generally cheaper to trade in the futures markets, for example, than in equities, but under some conditions it might be cheaper still to simply wait awhile, putting part of the portfolio in a risk-free instrument like a Treasury bill. Perhaps lost to history, in the midst of all this technological flurry, is the rise of the the phrase ''program trading.'' Wall Street traders flinch at those words, fearful that they conjure up images of machine-run markets, the financial world's answer to a launch-on-warning nuclear policy. Hard-liners like Mr. Margolis of Salomon even dislike the less intimidating wording of ''computer-assisted trading.'' Says he: ''There are chips in the dashboard of your car. Is that computer-assisted driving? Of course not.'' The difference, other experts argue, is that the dashboard chips do not yet suggest the routes a driver could take to reach a specific destination. Some trading programs do, though not explicitly. Still, the final judgment is in the hands of the human trader. The computer could warn of an aberration between S&P 500 futures prices and the price of the underlying basket of stocks, yet an experienced arbitrager could realize that the opportunity to exploit that difference is so brief that it would be gone by the time a trade is made. ''There are a lot of human judgments to be made,'' said Mr. Barbanel of Gruntal & Co. ''Technically, it would be possible to have the computer execute these trades for you, but you might not like the result.'' A CONSENSUS is emerging that, as the importance of networks that link buyers and sellers increases, the importance of the exchange floors will diminish. ''We are talking about an age where the stock market floor and the Chicago pits are a dinasaur. Trading off a screen creates a real, freeflowing marketplace'' where everyone can participate, said Mr. Barbanel. More debatable is the question of whether computer-assisted trading encourages volatility. Many argue that it does, particularly the buy and sell programs used in stock index arbitrage. The baskets of stocks are usually very large, involving several hundred different securities worth millions of dollars. But it does not follow that the markets are necessarily more volatile, at least in the long run. In fact, sometimes a program trade narrows the gap between two markets. On a percentage basis, according to one Salomon Brothers study published by Lazlo Birinyi Jr. and H. Nicholas Hanson in July, the markets today are not as volatile as they were in the 1920's or the 1930's. And they point out that while futures and options are claimed to spur volatility, the British market has recently been far more volatile than the New York Stock Exchange, although futures and options trading in Britain is minimal. Of course volatility, or even the perception of it, is what scares small investors. And that is the second complaint about how the computer has changed investing: that they have given professional traders another, major advantage over the little guy. That argument seems difficult to support, however. For all the activity that computers spur, it is not clear that they help predict the broad trends of the market. ''Because the programs look at technical features of the market, they don't tell you a whole lot about fundamental issues that move stocks,'' said Prof. Light of Harvard. ''The only advantage might come if you know when a program trade will kick in. That could be valuable information because an investor could try to get in ahead of it.'' Moreover, individual investors seem little interested in harnessing the power of the computer themselves. Lotus Development Corporation has tried for a year to market ''Signal,'' which links a personal computer, running a 1-2-3 spreadsheet, directly into real-time market data. So far, sales have been disappointing. ''The question isn't computer power,'' said one Lotus official. ''The question is whether people want to spend their lives in front of the screen watching the market. It looks like they have better things to do.'' But the most worrisome aspect of the ways computers are used now in financial markets, particularly in the case of program trading, may be how they have polarized the marketplace. One group of investors still focuses primarily on market fundamentals: A company's prospects, the strength of its management, the state of the economy. Another, growing sector focuses primarily on mathematical, short-term price discrepancies, the kinds of factors that computers, by their nature, can easily seize on. Just ask the company whose computers won Wall Street: I.B.M. Its executives bemoan the fact that I.B.M.'s stock gets buffeted most heavily whenever program trading starts, because the company is such a major presence in every stock index and a favorite of institutional holders. ''Program trading is a concern to us because it has introduced into the marketplace an element of volatility which is unrelated to economic conditions or a company's financial performance,'' the company said in a statement recently. ''We are concerned that individual investors will lose confidence in the market because stock prices are being driven by an increasing number of factors that have little to do with business fundamentals.'' A senior I.B.M. executive conceded recently that there was some irony in the world's largest computer company complaining about program trading. But, he joked, ''Computers don't kill stock markets. People do.'' SOFTWARE HOUSES CHASE A NEW MARKET The financial markets have long been a prime target for software companies, which strive constantly - and usually unsuccessfully - to replicate the success of the computerized spreadsheet. Now, with ever more sophisticated traders looking for new applications for personal computers, Wall Street has also become a testing ground for state-of-the-art software development. Most of the software aimed at the Street attempts to present old information in a new, easier-to-digest way. Programs like Marketvision, produced by a three-year-old company by the same name, sort columns of data into all varieties of charts and graphs, sometimes combining historical and real-time data. ''The key element is analysis: It helps you examine the psychology of the buying-selling trends that the charts reflect,'' said Warren S. Pyles, the chief executive of the 45-employee company. Others are taking the next step, embracing techniques that have emerged from artificial intelligence research. GURU, a year-old program brought out by Micro Data Base Systems in Lafeyette, Ind., merges the traditional financial spreadsheet with an ''expert system'' that can be programmed to follow the basic rules of thumb that traders would follow. One international trading house in Chicago, for example, uses the $3,000 package to do what a salesman would do: search the company's database of past sales, and find potential customers for certain financial instruments. Arbitragers are also beginning to make use of GURU, transforming it into a warning system that alerts traders to price discrepancies that they are in a position to exploit for quick profits. ''Timing is so important,'' said Gary Koehler, the president of Micro Data Base Systems, ''that the opportunity can be gone while you take your position in the market. You have to have a computer applying the rules of thumb, or you are lost.'' But many wonder whether the market is moved by too many subtle, unpredictable forces for any expert system to measure. So far, exchange rules bar any automatic execution of trades by computer. But many in the computer business, while unwilling to discuss the issue publicly, feel that rule will eventually fall. ''It's not a matter of human control or machine control, because the computers are programmed by humans,'' said one software executive. ''It's a question of efficiency.'' Graphic Drawings End of Document Letting Gamers Play God, and Now Themselves The New York Times

Time: 26/08/2012  
It has been a sore point with the Japanese that they win so few Nobel Prizes, even in the sciences. So KONOSUKE MATSUSHITA, the founder of one of the world's biggest consumer electronics companies, created the Japan Prize, an annual award in science and technology. Mr. Matsushita died last year. This year, the Japanese lost their own prize again. EMPEROR AKIHITO and EMPRESS MICHIKO presented $318,000 on Monday to MARIN MINSKY, the Massachusetts Institute of Technology professor who is considered the father of artificial intelligence. Professor Minsky has described several theories on ways to make machines learn by themselves, and has spun out theories of the human mind that could serve as models for simulating parts of the thinking process. Three other academics, all experts in plate tectonics, shared an award in earth science. They are WILLIAM J. MORGAN of Princeton University, DAN P. McKENZIE of Cambridge University in England and XAVIER LE PICHON of Ecole Normale Superieure in Paris. Correction A report in the Chronicle column on Wednesday about the Japan Prize, an award for achievement in science and technology, misidentified the winner for technology. He is Marvin Minsky, a professor at the Massachusetts Institute of Technology who is considered the father of artificial intelligence. Correction-Date: April 21, 1990, Saturday, Late Edition - Final End of Document TRULY BAD MOVIES; Some Can Spot It The New York Times

Time: 02/09/2014  
Calif. -- In factories and warehouses, robots routinely outdo humans in strength and precision. Artificial intelligence software can drive cars, beat grandmasters at chess and leave ''Jeopardy!'' champions in the dust. But machines still lack a critical element that will keep them from eclipsing most human capabilities anytime soon: a well-developed sense of touch. Consider Dr. Nikolas Blevins, a head and neck surgeon at Stanford Health Care who routinely performs ear operations requiring that he shave away bone deftly enough to leave an inner surface as thin as the membrane in an eggshell. Dr. Blevins is collaborating with the roboticists J. Kenneth Salisbury and Sonny Chan on designing software that will make it possible to rehearse these operations before performing them. The program blends X-ray and magnetic resonance imaging data to create a vivid three-dimensional model of the inner ear, allowing the surgeon to practice drilling away bone, to take a visual tour of the patient's skull and to virtually ''feel'' subtle differences in cartilage, bone and soft tissue. Yet no matter how thorough or refined, the software provides only the roughest approximation of Dr. Blevins's sensitive touch. ''Being able to do virtual surgery, you really need to have haptics,'' he said, referring to the technology that makes it possible to mimic the sensations of touch in a computer simulation. The software's limitations typify those of robotics, in which researchers lag in designing machines to perform tasks that humans routinely do instinctively. Since the first robotic arm was designed at the Stanford Artificial Intelligence Laboratory in the 1960s, robots have learned to perform repetitive factory work, but they can barely open a door, pick themselves up if they fall, pull a coin out of a pocket or twirl a pencil. The correlation between highly evolved artificial intelligence and physical ineptness even has a name: Moravec's paradox, after the robotics pioneer Hans Moravec, who wrote in 1988, ''It is comparatively easy to make computers exhibit adult-level performance on intelligence tests or playing checkers, and difficult or impossible to give them the skills of a 1-year-old when it comes to perception and mobility.'' Advances in haptics and kinematics, the study of motion control in jointed bodies, are essential if robots are ever to collaborate with humans in hoped-for roles like food service worker, medical orderly, office secretary and health care assistant. ''It just takes time, and it's more complicated,'' Ken Goldberg, a roboticist at the University of California, Berkeley, said of such advances. ''Humans are really good at this, and they have millions of years of evolution.'' Touch Impulses Touch is a much more complicated sense than one might think. Humans have an array of organs that allow them to sense pressure, sheer forces, temperature and vibrations with remarkable precision. (And German researchers have shown that raccoons have evolved the animal world's most sophisticated brain functions to process touch impulses in the dark.) Research suggests that our sense of touch is actually several orders of magnitude finer than previously believed. Last fall, for example, Swedish scientists reported in the journal Nature that dynamic human touch -- for example, when a finger slides across a surface -- could distinguish ridges no higher than 13 nanometers, or about 0.0000005 of an inch. That is the scale of individual molecules. Or as Mark Rutland, a professor of surface chemistry at the KTH Royal Institute of Technology in Sweden, put it, if your finger were as big as the earth, it could feel the difference between a car and a house. Physiologists have shown that the interaction between a finger and a surface is detected by organs called mechanoreceptors, which are embedded at different depths in the skin. Some are sensitive to changes in an object's size or shape and others to vibrations. In the case of tiny surface variations, cues come from Pacinian corpuscles, oval-shaped structures about a millimeter long (one twenty-fifth of an inch) that signal when they are deformed. Replicating that sensitivity is the goal of haptics, a science that is playing an increasing role in connecting the computing world to humans. One of the most significant advances in haptics has been made by Mako Surgical, founded in 2004 by the roboticist Rony Abovitz. In 2006, Mako began offering a robot that provides precise feedback to surgeons repairing arthritic knee joints. ''I thought haptics was a way to combine machine intelligence and human intelligence in a way that the machine would do what it was good at and the human would do what the human was good at, and there was this really interesting symbiosis that could come about,'' Mr. Abovitz said, adding: ''The surgeon still has the sense of control and can put the energy into the motion and push. But all of the intelligent guidance and what you thought the surgeon would normally do is done by the machine.'' Robotic Dangers Even in industries where robots are entrenched, experts worry about the dangers they pose to the people who work alongside them. Robots have caused dozens of workplace deaths and injuries in the United States; if a robot revolution is ever to take place, scientists will have to create machines that meet exacting safety standards -- and do it inexpensively. ''For the last 30 years, industrial robots have focused on one metric: being fast and cheap,'' said Kent Massey, the director of advanced programs at HDT Global, a robotics firm based in Solon, Ohio. ''It has been about speed. It's been awesome, but a standard arm today is precise and stiff and heavy, and they're really dangerous.'' Mr. Massey's company is one of a number of robot-arm designers that are beginning to build safer machines. Rethink Robotics in Boston and Universal Robots in Denmark have built ''compliant'' robots that sense human contact. The Universal system uses a combination of sensors in its joints and software, and the Rethink robot uses ''series elastic actuators'' -- essentially springs in the joints that mimic the compliance of human muscles and tendons and acoustic sensors so the robot can slow when humans approach. Beyond advances necessary for basic safety, scientists are focusing on more subtle aspects of touch. Last year, researchers at Georgia Tech reported in the journal Science that they had fabricated bundles of tiny transistors called taxels to measure changes in electrical charges that signal mechanical strain or pressure. The goal is to design touch-sensitive applications, including artificial skin for robots and other devices. Much research is focusing on vision and its role in touch. The newest da Vinci Xi, a surgery system developed by Intuitive Surgical Inc., uses high-resolution 3-D cameras to enable doctors to perform delicate operations remotely, manipulating tiny surgical instruments. The company focused on giving surgeons better vision, because the necessary touch for operating on soft tissue like organs is still beyond the capability of haptics technology. Curt Salisbury, a principal research engineer at SRI International, a nonprofit research institute, said that while surgeons could rely on visual cues provided by soft tissues to understand the forces exerted by their tools, there were times when vision alone would not suffice. ''Haptic feedback is critical when you don't have good visual access,'' he said. Other researchers believe that advances in sensors that more accurately model human skin, as well as algorithms that fuse vision, haptics and kinematics, will lead to vast improvements in the next generation of robots. One path is being pursued by Eduardo Torres-Jara, an assistant professor of robotics at Worcester Polytechnic Institute in Massachusetts, who has defined an alternative theory he describes as ''sensitive robotics.'' He has created a model of robotic motion, grasping and manipulation that begins with simply knowing where the robot's feet or hands meet the ground or an object. ''It is all about recognizing the tactile events and understanding that very well,'' he said. Using biologically inspired artificial skin that can detect tiny changes in magnetic forces, he has built a two-legged walking robot that is able to balance and stride by measuring changing forces on the bottoms of its feet. If improving tactile performance depends on greater computing power, help may be on the way. Dr. Goldberg, the Berkeley roboticist, has begun designing cloud-based robotic systems that can tap vast pools of computing power via the Internet. ''I'm very excited about the idea of cloud robotics,'' he said. ''It is lifting the limitation of computing that we've always had.'' In July, roboticists at Brown, Cornell, Stanford and Berkeley described a database called Robo Brain, sponsored by the National Science Foundation, that is intended to offer an Internet-based repository of images and videos to give robots support for performing actions in the physical world. For example, information on how to identify, grasp and carry a coffee mug would be accessible to any robot or robotic arm connected to the Internet. Other haptics researchers believe that artificially replicating touch will have a powerful effect on the development of autonomous robots, as well as systems that augment humans. Last fall, Allison Okamura, an associate professor of mechanical engineering at the Laboratory for Collaborative Haptics and Robotics in Medicine at Stanford, taught an online course in haptics. Students assembled ''hapkits'' designed by Dr. Okamura, the Stanford education professor Paulo Blikstein and Tania Morimoto, a Stanford graduate student. They then programmed them to create virtual devices like springs and dampers that could be manipulated as if they were in the real world. The students followed with new projects, tweaking the hardware and sharing programs they had created. Dr. Okamura said their enthusiasm was understandable. ''If you have all these senses -- vision, hearing, taste, touch and smell -- and someone took them away from you one by one, which is the last one you would give up?'' she asked. ''Almost everyone says vision, but for me, it would be touch.'' http : // www.nytimes.com/2014/09/02/science/robot-touch.html Graphic PHOTOS: Technology will need to advance robotic touch and motion control if robots are ever to collaborate with humans in roles like food service worker, medical orderly, office secretary, or health care assistant, robotic experts say. (PHOTOGRAPH BY HDT GLOBAL) (D1) Top, Stanford graduate students test haptic bands, which give off vibrations, allowing them to adjust their movements accordingly. Above, the master manipulator of a DaVinci surgical robot. (PHOTOGRAPHS BY KRISTINA COPPLIN AKIKO NABESHIMA) Tania Morimoto, a Stanford University graduate student, working with a hapkit, which can be programmed to create virtual devices. (PHOTOGRAPH BY JONATHAN EDELMAN) Dr. Nikolas Blevins, a head and neck surgeon at Stanford Health Care, and Hollin Calloway, a third-year resident, using haptic technology, which allows surgeons to practice with 3D software. (PHOTOGRAPH BY JASON HENRY FOR THE NEW YORK TIMES) (D2) Load-Date: September 4, 2014 End of Document Google, Rebuilding Its Presence in China, Invests in Retailer JD.com The New York Times

Time: 15/10/2013  
gaggle of Harry Potter fans descended for several days this summer on the Oregon Convention Center in Portland for the Leaky Con gathering, an annual haunt of a group of predominantly young women who immerse themselves in a fantasy world of magic, spells and images. The jubilant and occasionally squealing attendees appeared to have no idea that next door a group of real-world wizards was demonstrating technology that only a few years ago might have seemed as magical. The scientists and engineers at the Computer Vision and Pattern Recognition conference are creating a world in which cars drive themselves, machines recognize people and ''understand'' their emotions, and humanoid robots travel unattended, performing everything from mundane factory tasks to emergency rescues. C.V.P.R., as it is known, is an annual gathering of computer vision scientists, students, roboticists, software hackers -- and increasingly in recent years, business and entrepreneurial types looking for another great technological leap forward. The growing power of computer vision is a crucial first step for the next generation of computing, robotic and artificial intelligence systems. Once machines can identify objects and understand their environments, they can be freed to move around in the world. And once robots become mobile they will be increasingly capable of extending the reach of humans or replacing them. Self-driving cars, factory robots and a new class of farm hands known as ag-robots are already demonstrating what increasingly mobile machines can do. Indeed, the rapid advance of computer vision is just one of a set of artificial intelligence-oriented technologies -- others include speech recognition, dexterous manipulation and navigation -- that underscore a sea change beyond personal computing and the Internet, the technologies that have defined the last three decades of the computing world. ''During the next decade we're going to see smarts put into everything,'' said Ed Lazowska, a computer scientist at the University of Washington who is a specialist in Big Data. ''Smart homes, smart cars, smart health, smart robots, smart science, smart crowds and smart computer-human interactions.'' The enormous amount of data being generated by inexpensive sensors has been a significant factor in altering the center of gravity of the computing world, he said, making it possible to use centralized computers in data centers -- referred to as the cloud -- to take artificial intelligence technologies like machine-learning and spread computer intelligence far beyond desktop computers. Apple was the most successful early innovator in popularizing what is today described as ubiquitous computing. The idea, first proposed by Mark Weiser, a computer scientist with Xerox, involves embedding powerful microprocessor chips in everyday objects. Steve Jobs, during his second tenure at Apple, was quick to understand the implications of the falling cost of computer intelligence. Taking advantage of it, he first created a digital music player, the iPod, and then transformed mobile communication with the iPhone. Now such innovation is rapidly accelerating into all consumer products. ''The most important new computer maker in Silicon Valley isn't a computer maker at all, it's Tesla,'' the electric car manufacturer, said Paul Saffo, a managing director at Discern Analytics, a research firm based in San Francisco. ''The car has become a node in the network and a computer in its own right. It's a primitive robot that wraps around you.'' Here are several areas in which next-generation computing systems and more powerful software algorithms could transform the world in the next half-decade. Artificial Intelligence With increasing frequency, the voice on the other end of the line is a computer. It has been two years since Watson, the artificial intelligence program created by I.B.M., beat two of the world's best ''Jeopardy'' players. Watson, which has access to roughly 200 million pages of information, is able to understand natural language queries and answer questions. The computer maker had initially planned to test the system as an expert adviser to doctors; the idea was that Watson's encyclopedic knowledge of medical conditions could aid a human expert in diagnosing illnesses, as well as contributing computer expertise elsewhere in medicine. In May, however, I.B.M. went a significant step farther by announcing a general-purpose version of its software, the ''I.B.M. Watson Engagement Advisor.'' The idea is to make the company's question-answering system available in a wide range of call center, technical support and telephone sales applications. The company says that as many as 61 percent of all telephone support calls currently fail because human support-center employees are unable to give people correct or complete information. Watson, I.B.M. says, will be used to help human operators, but the system can also be used in a ''self-service'' mode, in which customers can interact directly with the program by typing questions in a Web browser or by speaking to a speech recognition program. That suggests a ''Freakonomics'' outcome: There is already evidence that call-center operations that were once outsourced to India and the Philippines have come back to the United States, not as jobs, but in the form of software running in data centers. Robotics A race is under way to build robots that can walk, open doors, climb ladders and generally replace humans in hazardous situations. In December, the Defense Advanced Research Projects Agency, or Darpa, the Pentagon's advanced research arm, will hold the first of two events in a $2 million contest to build a robot that could take the place of rescue workers in hazardous environments, like the site of the damaged Fukushima Daiichi nuclear plant. Scheduled to be held in Miami, the contest will involve robots that compete at tasks as diverse as driving vehicles, traversing rubble fields, using power tools, throwing switches and closing valves. In addition to the Darpa robots, a wave of intelligent machines for the workplace is coming from Rethink Robots, based in Boston, and Universal Robots, based in Copenhagen, which have begun selling lower-cost two-armed robots to act as factory helpers. Neither company's robots have legs, or even wheels, yet. But they are the first commercially available robots that do not require cages, because they are able to watch and even feel their human co-workers, so as not to harm them. For the home, companies are designing robots that are more sophisticated than today's vacuum-cleaner robots. Hoaloha Robotics, founded by the former Microsoft executive Tandy Trower, recently said it planned to build robots for elder care, an idea that, if successful, might make it possible for more of the aging population to live independently. Seven entrants in the Darpa contest will be based on the imposing humanoid-shaped Atlas robot manufactured by Boston Dynamics, a research company based in Waltham, Massachusetts. Among the wide range of other entrants are some that look anything but humanoid -- with a few that function like ''transformers'' from the world of cinema. The contest, to be held in the infield of the Homestead-Miami Speedway, may well have the flavor of the bar scene in ''Star Wars.'' Intelligent Transportation Amnon Shashua, an Israeli computer scientist, has modified his Audi A7 by adding a camera and artificial-intelligence software, enabling the car to drive the 65 kilometers, or 40 miles, between Jerusalem and Tel Aviv without his having to touch the steering wheel. In 2004, Darpa held the first of a series of ''Grand Challenges'' intended to spark interest in developing self-driving cars. The contests led to significant technology advances, including ''Traffic Jam Assist'' for slow-speed highway driving; ''Super Cruise'' for automated freeway driving, already demonstrated by General Motors and others; and self-parking, a feature already available from a number of car manufacturers. Recently General Motors and Nissan have said they will introduce completely autonomous cars by the end of the decade. In a blend of artificial-intelligence software and robotics, Mobileye, a small Israeli manufacturer of camera technology for automotive safety that was founded by Mr. Shashua, has made considerable progress. While Google and automotive manufacturers have used a variety of sensors including radars, cameras and lasers, fusing the data to provide a detailed map of the rapidly changing world surround a moving car, Mobileye researchers are attempting to match that accuracy with just video cameras and specialized software. Emotional Computing At a preschool near the University of California, San Diego, a child-size robot named Rubi plays with children. It listens to them, speaks to them and understands their facial expressions. Rubi is an experimental project of Prof. Javier Movellan, a specialist in machine learning and robotics. Professor Movellan is one of a number of researchers now working on a class of computers that can interact with humans, including holding conversations. Computers that understand our deepest emotions hold the promise of a world full of brilliant machines. They also raise the specter of an invasion of privacy on a scale not previously possible, as they move a step beyond recognizing human faces to the ability to watch the array of muscles in the face and decode the thousands of possible movements into an understanding of what people are thinking and feeling. These developments are based on the work of the American psychologist Paul Ekman, who explored the relationship between human emotion and facial expression. His research found the existence of ''micro expressions'' that expose difficult-to-suppress authentic reactions. In San Diego, Professor Movellan has founded a company, Emotient, that is one of a handful of start-ups pursuing applications for the technology. A near-term use is in machines that can tell when people are laughing, crying or skeptical -- a survey tool for film and television audiences. Farther down the road, it is likely that applications will know exactly how people are reacting as the conversation progresses, a step well beyond Siri, Apple's voice recognition system. Harry Potter fans, stand by. http : // www.nytimes.com/2013/10/15/technology/the-rapid-advance-of-artificial-intelligence.html Load-Date: October 22, 2013 End of Document David L. Waltz, Computer Science Pioneer, Dies at 68 The New York Times

Time: 06/01/2013  
do you get when you cross a fragrance with an actor? Answer: a smell Gibson. Groan away, but you should know that this joke was written by a computer. ''Smell Gibson'' is the C.P.U. child of something called Standup (for System to Augment Non-Speakers' Dialogue Using Puns), a program that generates punning riddles to help kids with language disabilities increase their verbal skills. Though it's not quite Louis C. K., the Standup program, engineered by a team of computer scientists in Scotland, is one of the more successful efforts to emerge from a branch of artificial intelligence known as computational humor, which seeks to model comedy using machines. As verbal interaction between humans and computers becomes more prominent in daily life -- from Siri, Apple's voice-activated assistant technology, to speech-based search engines to fully automated call centers -- demand has grown for ''social computers'' that can communicate with humans in a natural way. Teaching computers to grapple with humor is a key part of this equation. ''Humor is everywhere in human life,'' says the Purdue computer scientist Julia M. Taylor, who helped organize the first-ever United States symposium on the artificial intelligence of humor, in November. If we want a computational system to communicate with human life, it needs to know how to be funny, she says. As it turns out, this is one of the most challenging tasks in computer science. Like much of language, humor is loaded with abstraction and ambiguity. To understand it, computers need to contend with linguistic sleights like irony, sarcasm, metaphor, idiom and allegory -- things that don't readily translate into ones and zeros. On top of that, says Lawrence J. Mazlack of the University of Cincinnati, a seminal figure in the field of computational linguistics, humor is context-dependent: what's funny in one situation may not be funny in another. As an example, he cites Henny Youngman's signature line, ''Take my wife -- please,'' which came about by accident when an usher seating Youngman's wife mistook the comedian's request for a gag. The cognitive processes that cause people to snicker at this sort of one-liner are only partly understood, which makes it all the more difficult for computers to mimic them. Unlike, say, chess, which is grounded in a fixed set of rules, there are no hard-and-fast formulas for comedy. To get around that cognitive complexity, computational humor researchers have by and large taken a more concrete approach: focusing on simple linguistic relationships, like double meanings, rather than on trying to model the high-level mental mechanics that underlie humor. Standup, for instance, writes jokes by searching through a ''lexical database'' (basically, a huge dictionary) for words that fit linguistic patterns found in puns -- phonetic and semantic similarities, mostly -- and comes up with doozies like: ''What do you call a fish tank that has a horn? A goldfish bull.'' Another tack has been to apply machine-learning algorithms, which crunch mountains of data to identify statistical features that can be used to classify text as funny or unfunny. This is more or less how spam filters work: they decide which messages to tag by analyzing billions of e-mails and compiling a database of red flags (like any urgent message from a deposed Nigerian prince). Figuring out when a joke is a joke is where artificial intelligence researchers have made, perhaps, the most progress. For her Ph.D. dissertation, Dr. Taylor built a system that could identify children's jokes out of various selections of prose with remarkable accuracy. Not only that, but it could also explain why it found something funny, which suggests that on some level it ''got'' the jokes. In a related experiment, the computer scientists Rada Mihalcea at the University of North Texas, Denton, and Carlo Strapparava, now at Fondazione Bruno Kessler in Italy, trained computers to separate humorous one-liners from nonhumorous sentences borrowed from Reuters headlines, proverbs and other texts. By analyzing the content and style of these sentences, the program was able to spot the jokes with an average accuracy of 87 percent. Putting such research to good use, a pair of wags at the University of Washington last year taught a computer when to use the refrain ''That's what she said'' -- theirs being one of the few academic papers to cite ''The Office'' among its references. Some will surely wonder if the point of such research goes beyond devising software that can make the C++ set crack up at hackathons. Thankfully, it does. The goal of computational humor, and of computational linguistics as a whole, is to design machines akin to the shipboard computer on ''Star Trek'' -- ones that can answer open-ended questions and carry on casual conversations with human beings, even William Shatner. In the process, scientists hope to gain insights into the nature of humor: Why do we laugh at certain things and not at others? Why does anyone watch ''Two and a Half Men''? If computer humorists can answer any of these questions, we won't just get a deeper understanding of how language works but also, ultimately, what it means to be human. http : // www.nytimes.com/2013/01/06/opinion/sunday/can-computers-be-funny.html Graphic DRAWING (DRAWING BY DAVID REES) Load-Date: January 6, 2013 End of Document Computers Jump to the Head of the Class The New York Times

Time: 24/11/2012  
Using an artificial intelligence technique inspired by theories about how the brain recognizes patterns, technology companies are reporting startling gains in fields as diverse as computer vision, speech recognition and the identification of promising new molecules for designing drugs. The advances have led to widespread enthusiasm among researchers who design software to perform human activities like seeing, listening and thinking. They offer the promise of machines that converse with humans and perform tasks like driving cars and working in factories, raising the specter of automated robots that could replace human workers. The technology, called deep learning, has already been put to use in services like Apple's Siri virtual personal assistant, which is based on Nuance Communications' speech recognition service, and in Google's Street View, which uses machine vision to identify specific addresses. But what is new in recent months is the growing speed and accuracy of deep-learning programs, often called artificial neural networks or just ''neural nets'' for their resemblance to the neural connections in the brain. ''There has been a number of stunning new results with deep-learning methods,'' said Yann LeCun, a computer scientist at New York University who did pioneering research in handwriting recognition at Bell Laboratories. ''The kind of jump we are seeing in the accuracy of these systems is very rare indeed.'' Artificial intelligence researchers are acutely aware of the dangers of being overly optimistic. Their field has long been plagued by outbursts of misplaced enthusiasm followed by equally striking declines. In the 1960s, some computer scientists believed that a workable artificial intelligence system was just 10 years away. In the 1980s, a wave of commercial start-ups collapsed, leading to what some people called the ''A.I. winter.'' But recent achievements have impressed a wide spectrum of computer experts. In October, for example, a team of graduate students studying with the University of Toronto computer scientist Geoffrey E. Hinton won the top prize in a contest sponsored by Merck to design software to help find molecules that might lead to new drugs. From a data set describing the chemical structure of thousands of different molecules, they used deep-learning software to determine which molecule was most likely to be an effective drug agent. The achievement was particularly impressive because the team decided to enter the contest at the last minute and designed its software with no specific knowledge about how the molecules bind to their targets. The students were also working with a relatively small set of data; neural nets typically perform well only with very large ones. ''This is a really breathtaking result because it is the first time that deep learning won, and more significantly it won on a data set that it wouldn't have been expected to win at,'' said Anthony Goldbloom, chief executive and founder of Kaggle, a company that organizes data science competitions, including the Merck contest. Advances in pattern recognition hold implications not just for drug development but for an array of applications, including marketing and law enforcement. With greater accuracy, for example, marketers can comb large databases of consumer behavior to get more precise information on buying habits. And improvements in facial recognition are likely to make surveillance technology cheaper and more commonplace. Artificial neural networks, an idea going back to the 1950s, seek to mimic the way the brain absorbs information and learns from it. In recent decades, Dr. Hinton, 64 (a great-great-grandson of the 19th-century mathematician George Boole, whose work in logic is the foundation for modern digital computers), has pioneered powerful new techniques for helping the artificial networks recognize patterns. Modern artificial neural networks are composed of an array of software components, divided into inputs, hidden layers and outputs. The arrays can be ''trained'' by repeated exposures to recognize patterns like images or sounds. These techniques, aided by the growing speed and power of modern computers, have led to rapid improvements in speech recognition, drug discovery and computer vision. Deep-learning systems have recently outperformed humans in certain limited recognition tests. Last year, for example, a program created by scientists at the Swiss A. I. Lab at the University of Lugano won a pattern recognition contest by outperforming both competing software systems and a human expert in identifying images in a database of German traffic signs. The winning program accurately identified 99.46 percent of the images in a set of 50,000; the top score in a group of 32 human participants was 99.22 percent, and the average for the humans was 98.84 percent. This summer, Jeff Dean, a Google technical fellow, and Andrew Y. Ng, a Stanford computer scientist, programmed a cluster of 16,000 computers to train itself to automatically recognize images in a library of 14 million pictures of 20,000 different objects. Although the accuracy rate was low -- 15.8 percent -- the system did 70 percent better than the most advanced previous one. Deep learning was given a particularly audacious display at a conference last month in Tianjin, China, when Richard F. Rashid, Microsoft's top scientist, gave a lecture in a cavernous auditorium while a computer program recognized his words and simultaneously displayed them in English on a large screen above his head. Then, in a demonstration that led to stunned applause, he paused after each sentence and the words were translated into Mandarin Chinese characters, accompanied by a simulation of his own voice in that language, which Dr. Rashid has never spoken. The feat was made possible, in part, by deep-learning techniques that have spurred improvements in the accuracy of speech recognition. Dr. Rashid, who oversees Microsoft's worldwide research organization, acknowledged that while his company's new speech recognition software made 30 percent fewer errors than previous models, it was ''still far from perfect.'' ''Rather than having one word in four or five incorrect, now the error rate is one word in seven or eight,'' he wrote on Microsoft's Web site. Still, he added that this was ''the most dramatic change in accuracy'' since 1979, ''and as we add more data to the training we believe that we will get even better results.'' One of the most striking aspects of the research led by Dr. Hinton is that it has taken place largely without the patent restrictions and bitter infighting over intellectual property that characterize high-technology fields. ''We decided early on not to make money out of this, but just to sort of spread it to infect everybody,'' he said. ''These companies are terribly pleased with this.'' Referring to the rapid deep-learning advances made possible by greater computing power, and especially the rise of graphics processors, he added: ''The point about this approach is that it scales beautifully. Basically you just need to keep making it bigger and faster, and it will get better. There's no looking back now.'' http : // www.nytimes.com/2012/11/24/science/scientists-see-advances-in-deep-learning-a-part-of-artificial-intelligence.html Graphic PHOTOS: A voice recognition program translated a speech given by Richard F. Rashid, Microsoft's top scientist, into Mandarin Chinese. (PHOTOGRAPH BY HAO ZHANG) A student team led by the computer scientist Geoffrey E. Hinton used deep-learning technology to design software. (PHOTOGRAPH BY KEITH PENNER)(A3) Load-Date: November 29, 2012 End of Document Brain Gain The New York Times

Time: 01/09/2013  
If Nissan has its way, reading your e-mail while driving to work may soon be acceptable behind-the-wheel behavior. The automaker says it will market autonomous-drive vehicles -- cars that can operate without the assistance of a driver -- by 2020. Carlos Ghosn, chief executive of Nissan, said in a news release, ''I am committing to be ready to introduce a new groundbreaking technology, autonomous drive, by 2020, and we are on track to realize it.'' A host of advanced equipment is needed for autonomous operation, including cameras that can see the area surrounding the vehicle; radar sensors that measure distance; laser scanners that detect the shape of objects; a global-positioning sensor that locates the vehicle; advanced computer systems that apply artificial intelligence to that data and make driving decisions; and a variety of actuators that can execute driving maneuvers while compensating for less than ideal conditions. In a speech at a media event in California, Andy Palmer, a Nissan executive vice president, said, ''Our autonomous-driving vehicles utilize cameras, sensors, global positioning sensors and machine technologies -- including the Safety Shield features already offered in many of our models -- to maneuver with reduced human intervention, or without any human intervention.'' That suggests levels of autonomy that a driver could select. In an e-mail, Steve Yaeger, a Nissan spokesman, confirmed that autonomous operation was driver-selectable in prototype vehicles the automaker demonstrated at a recent media event. Some of today's vehicles, including some made by Nissan, qualify as semiautonomous. Intelligent cruise control can keep track of a vehicle's place in traffic and adjust speed accordingly. Lane-departure warning systems can alert the driver if the vehicle crosses over lane markings. Lane-departure prevention systems go a step further and apply corrective measures. Intelligent braking systems can bring a vehicle to a halt if the driver fails to brake in time. But it's a giant step from these aids to fully autonomous operation. Providing assistance when a driver fails to react is a technical challenge, but developing a foolproof artificial intelligence system that can make all driving decisions is far more complex. Technical hurdles are just one of the problems that an autonomous vehicle pioneer faces. Bryan Reimer, a research scientist engaged in driver workload studies at the Massachusetts Institute of Technology, isn't sure that humans can cope with these technologies. His research, and the work of others in the field, has determined that the sweet spot for driver awareness is somewhere between understimulated and overstimulated. ''We are capable of developing the sensors and systems for an autonomous vehicle, but do we know how people will interact?'' he said in a telephone interview. ''What happens when people start driving them? Autonomy complacency among pilots has become a problem in aviation. The broad issue is not whether we can develop the technologies, but whether we can develop cohesive interfaces that drivers can operate successfully without losing their skills.'' In May, the National Highway Traffic Safety Administration announced plans for research on safety issues related to autonomous vehicles. A policy statement expressed support for technologies that ''have the potential to reduce significantly the many thousands of fatalities and injuries that occur each year as a result of motor vehicle crashes.'' The agency has not published standards but has said, ''Research will be performed to support the development of any potential technical requirements for automated vehicle systems.'' There is also the question of liability. Will the vehicle occupant who is not actually at the controls of an autonomous vehicle be liable if that vehicle is involved in an accident, or will the manufacturer that engineered the driving system have to accept responsibility? Nissan's introduction of the fully electric Leaf before the development of the infrastructure necessary to support E.V.'s was a bold move. An autonomous-drive vehicle takes the company's boldness to a new level. But Nissan is making the leap and has begun development of a proving ground in Japan that would enable testing of autonomous vehicles in real-world conditions. ''Nissan Motor Company is ready,'' Mr. Palmer said. ''We are on a mission to be the most progressive car company in the world, and to redefine how motorists interact with their vehicles.'' With the driverless Nissan scheduled to appear in seven years, the world may be ready when it arrives. But the technology is not ready yet. In its Preliminary Statement of Policy Concerning Automated Vehicles, N.H.T.S.A., which will have the final word on autonomous vehicles in the United States, wrote that it ''does not recommend that states authorize the operation of self-driving vehicles for purposes other than testing at this time,'' adding, ''We believe there are a number of technological issues as well as human performance issues that must be addressed before self-driving vehicles can be made widely available.'' http : // www.scribd.com/doc/163845485/Automated-Vehicles-Policy This is a more complete version of the story than the one that appeared in print. http : // wheels.blogs.nytimes.com/2013/08/29/nissan-announces-plans-to-release-driverless-cars-by-2020/ Graphic PHOTO: SOLO: Nissan says it plans to have an autonomous car on the market by 2020. (PHOTOGRAPH BY NISSAN NORTH AMERICA) Load-Date: September 1, 2013 End of Document Spielberg Using Kubrick Script for Napoleon Series The New York Times

Time: 12/07/2013  
Mass. -- Moving its hands as if it were dealing cards and walking with a bit of a swagger, a Pentagon-financed humanoid robot named Atlas made its first public appearance on Thursday. C3PO it's not. But its creators have high hopes for the hydraulically powered machine. The robot -- which is equipped with both laser and stereo vision systems, as well as dexterous hands -- is seen as a new tool that can come to the aid of humanity in natural and man-made disasters. Atlas is being designed to perform rescue functions in situations where humans cannot survive. The Pentagon has devised a challenge in which competing teams of technologists program it to do things like shut off valves or throw switches, open doors, operate power equipment and travel over rocky ground. The challenge comes with a $2 million prize. Some see Atlas's unveiling as a giant -- though shaky -- step toward the long-anticipated age of humanoid robots. ''People love the wizards in Harry Potter or 'Lord of the Rings,' but this is real,'' said Gary Bradski, a Silicon Valley artificial intelligence specialist and a co-founder of Industrial Perception Inc., a company that is building a robot able to load and unload trucks. ''A new species, Robo sapiens, are emerging,'' he said. The debut of Atlas on Thursday was a striking example of how computers are beginning to grow legs and move around in the physical world. Although robotic planes already fill the air and self-driving cars are being tested on public roads, many specialists in robotics believe that the learning curve toward useful humanoid robots will be steep. Still, many see them fulfilling the needs of humans -- and the dreams of science fiction lovers -- sooner rather than later. Walking on two legs, they have the potential to serve as department store guides, assist the elderly with daily tasks or carry out nuclear power plant rescue operations. ''Two weeks ago 19 brave firefighters lost their lives,'' said Gill Pratt, a program manager at the Defense Advanced Research Projects Agency, part of the Pentagon, which oversaw Atlas's design and financing. ''A number of us who are in the robotics field see these events in the news, and the thing that touches us very deeply is a single kind of feeling which is, can't we do better? All of this technology that we work on, can't we apply that technology to do much better? I think the answer is yes.'' Dr. Pratt equated the current version of Atlas to a 1-year-old. ''A 1-year-old child can barely walk, a 1-year-old child falls down a lot,'' he said. ''As you see these machines and you compare them to science fiction, just keep in mind that this is where we are right now.'' But he added that the robot, which has a brawny chest with a computer and is lit by bright blue LEDs, would learn quickly and would soon have the talents that are closer to those of a 2-year-old. The event on Thursday was a ''graduation'' ceremony for the Atlas walking robot at the office of Boston Dynamics, the robotics research firm that led the design of the system. The demonstration began with Atlas shrouded under a bright red sheet. After Dr. Pratt finished his remarks, the sheet was pulled back revealing a machine that looked a like a metallic body builder, with an oversized chest and powerful long arms. Though Atlas is hydraulically powered, its pump gave off a loud buzzing noise as it flexed its limbs and spun its arms in circles in a very unhuman motion. After the brief demonstration, the first Atlas was switched off and a second robot demonstrated walking on a long treadmill. Both robots remained tethered, to prevent them from falling. Although experimental robots have been on the scene at least as far back as the Japanese Wabot-1 in 1973, researchers said that the field was now evolving rapidly. This month, Honda's Asimo robot began a stint as museum guide in Tokyo. The Atlas robots, which are made from aircraft-grade aluminum and titanium and each weigh 330 pounds, will take part in the Pentagon contest. Six of them will be given to companies that are being asked to program them for a competition next year, with a $2 million prize to the company that programs the robot most able to perform an elaborate rescue mission. The competition will be held at Homestead Miami Speedway in December. The six teams, which were previously announced, are from the Florida Institute of Human & Machine Cognition in Pensacola, Fla.; Worcester Polytechnic Institute in Massachusetts; the Massachusetts Institute of Technology; TracLabs in Webster, Tex.; the Jet Propulsion Laboratory; and Virginia Tech. A wide variety of other teams that are building their own robots -- some of which are exotic contraptions, not in humanoid forms -- will also join the competition. The contest involves programming the robot so that it is able to climb into a vehicle, drive to a destination, get out of the vehicle, cross a rubble field, open a door, use a power tool and turn a valve. The robots will be linked to a remote host computer and guided by human operators. To add realism to the competition, the Pentagon research agency will vary the data speed available to the robots during the competition. As a result, the systems that are more autonomous will have a significant advantage because they will be able to complete tasks while they are not under direct human control. Later this year, the teams will compete with robots programmed to perform tasks separately. However, the Pentagon's advanced research agency is hoping that within a year enough progress will have been made to have the robots complete a set of tasks. The agency stressed that it was not interested in designing either offensive or defensive weapons systems. Rather, officials said, they want to build robots that can help the military provide assistance in disaster situations. Dr. Pratt said that the nuclear crisis at the Fukushima Daiichi power plant inspired the idea to hold a contest focused on creating robots that could operate in environments hostile to humans. Even before the Fukushima disaster, Marvin Minsky, a pioneer in artificial intelligence research, castigated the nuclear power agency for being unprepared for disasters. ''Three Mile Island really needed telepresence,'' he wrote in IEEE Spectrum in 2010. ''I am appalled by the nuclear industry's inability to deal with the unexpected. We all saw the absurd inflexibility of present-day technology in handling the damage and making repairs to that reactor.'' Dr. Pratt said he hoped that the robot contest would have an impact similar to the autonomous vehicle challenge it began in 2004. ''What the prior Darpa challenges did is that, by injecting all of these resources and by having a strong and visible competition, they really pushed the field over that hump, and now people know that it can be done,'' he said. http : // www.nytimes.com/2013/07/12/science/modest-debut-of-atlas-may-foreshadow-age-of-robo-sapiens.html Graphic PHOTO: Honda's Asimo robot during a demonstration in Tokyo on July 3. The Pentagon's Atlas made its first appearance on Thursday. (PHOTOGRAPH BY SHIZUO KAMBAYASHI/ASSOCIATED PRESS) Load-Date: July 13, 2013 End of Document If Our Gadgets Could Measure Our Emotions The New York Times

Time: 10/12/2012  
-- Joseph Schlesinger, an engineer living near Boston, thinks robotic toys are too expensive, the result of extravagant designs, expensive components and a poor understanding of consumer tastes. So this year, Mr. Schlesinger, 23, began to manufacture an affordable robot, one he is selling for $250 to holiday shoppers. His creation, the Hexy, is a six-legged, crablike creature that can navigate its own environment and respond to humans with a hand wave or other programmable gesture. Mr. Schlesinger said he had been able to lower production costs by using free software and by molding a lot of the plastic parts locally in Massachusetts, not in China. Since setting up his company, ArcBotics, in suburban Somerville, Massachusetts, Mr. Schlesinger has built a backlog of more than 1,000 orders. His goal, he said, was to become ''the Ikea of robotics.'' ''I think the market for consumer robotics is poised to explode,'' said Mr. Schlesinger, a graduate of Worcester Polytechnic Institute in Massachusetts. ''We are only at the beginning.'' Since the 1960s, robots have assumed major roles in industrial manufacturing and assembly, the remote detonation of explosives, search and rescue, and academic research. But the devices have remained out of reach, in affordability and practicality, to most consumers. That, according to Professor Andrew Ng, the director of the Artificial Intelligence Lab at Stanford University in California, is about to change. One big reason, Mr. Ng said, is the mass production of smartphones and game consoles, which has driven down the size and price of robotic building blocks like accelerometers, gyroscopes and sensors. On the edges of consumer consciousness, the first generation of devices with rudimentary artificial intelligence are beginning to appear: entertainment and educational robots like the Hexy, and a line of tireless household drones that can mow lawns, sweep floors, clean swimming pools and even enhance golf games. ''I'm seeing a huge explosion of robotic toys and believe that there will be one soon in industry,'' said Mr. Ng, an associated professor of computer science at Stanford. The most advanced robots remain exotic workhorses like NASA's Mars Curiosity Rover, which cost $2.5 billion, and the LS3, a doglike robot being developed for the U.S. military that can carry a 400-pound, or 180-kilogram load more than 20 miles, or about 30 kilometers. The mechanical beast of burden, whose price is not public, is being made by a consortium led by Boston Dynamics. In Menlo Park, California, engineers at Willow Garage, a robotics firm, are selling the two-armed, 5-foot-4 inch (1.63-meter) rolling robot called the PR2 for $400,000. A video on Willow Garage's Web site shows the PR2 fetching beer from a refrigerator, which while an engineering and programming feat, is an expensive way to get beer. ''I think we're still some years away from useful personal robots making pervasive appearances in our homes,'' Mr. Ng said. Right now, for the masses, there is the CaddyTrek, a robotic golf club carrier that follows a player from tee to fairway to green through tall grass, up 30-degree slopes and in snow, for as many as 27 holes on a single charge. Players wear a remote control on their belts, which acts as a homing beacon for the self-propelled cart, which trails six paces behind the player. Golfers can also navigate the robotic cart, which is made by FTR Systems, to the next tee while they finish putting. ''Someone ran up to me last week and said that my golf cart had broken free and was rolling through the parking lot,'' said Richard Nagle, the sales manager for CaddyTrek in North America and Europe. ''Most people just stop and stare. They're not used to this.'' FTR Systems does not disclose the proprietary technology it uses to power the CaddyTrek, which sells for $1,595, but Mr. Nagle said sales of the robot carriers had been strong, and the company had been rushing to meet orders in the United States and Europe. While one robot totes your golf clubs, another, the Polaris 9300xi, could be cleaning your swimming pool. The blue, four-wheel drone submerges in a swimming pool and pushes itself along the bottom and walls to dislodge and filter sediment. The device, which is made by Zodiac Pool Systems of San Diego, cleans pools as much as 60 feet long. Users can program the robot to clean a swimming pool at regular intervals or use a remote control to steer it by hand. The Polaris 9300xi sells for $1,379. A silent, four-wheeled grass cutter called the Automower, made by Husqvarna, a Swedish power tool and lawn care company that also owns the McCulloch and Gardena brands, can care for lawns as large as 6,000 square meters, or 64,000 square feet. The Automower cuts grass by staying within a boundary wire drawn around the perimeter, sensing and avoiding trees, flower beds and other obstacles. The mower, which is sold in Europe and Asia but not in the United States, cuts rain or shine and returns to recharge itself when its batteries get low. Advanced models use GPS and can recognize and return to narrow, hard-to-reach parts of lawns and gardens, ensuring that no areas are missed. The least expensive garden drone, the Automower 305, costs &#x20ac;1,500, or $1,965, and can mow 500 square meters on one charge. The top-end Automower 265AX sells for about &#x20ac;4,600 in Europe and is designed for hospitals, hotels and commercial properties. The Swedish company sold its first robotic mower, which was solar-powered, in 1995. But the device was too expensive and too unreliable in climates like that of northern Europe, where sunny summers are not guaranteed. About five years ago, the Husqvarna switched to battery power, which lowered the cost and eliminated weather as a factor. Henric Andersson, the director of product development at Husqvarna in Stockholm, said the company's robotic mowers were getting extensive use in Scandinavia and Europe. ''After being around for years, sales really began taking off about five years ago,'' said Mr. Andersson. ''The graph of sales looks like a hockey stick. The robotic mower has reached a tipping point. More people are now incorporating the device into their lives.'' Other basic robots are beginning to work inside the home. iRobot, a firm founded by three former employees at the Massachusetts Institute of Technology, makes robots that vacuum, sweep and mop floors. The iRobot Roomba 790, which costs &#x20ac;900 in Europe, is a self-propelling vacuum cleaner that can sense and navigate interior spaces, adjusting by itself from carpets to hard floors, and wielding side brushes for corners and walls. The iRobot Scooba 390 cleans sealed hardwood, tile and linoleum floors, no pre-sweeping required. The device looks like a hovering bathroom scale and can hug walls and avoid staircases and other dangerous drops as it cleans, vacuums, wet mops and dries as much as 850 square feet of floor on a single charge. The Scooba 390 sells for &#x20ac;500. Theoretically, a house full of robotic gadgets can lead to more free time, which is where the AR Drone 2.0 quadricopter, a flying, smartphone-controlled helicopter, may come in. The AR Drone 2.0 is equipped with two onboard video cameras: one conventional and one high-definition, which can stream and store video of its flights. The AR Drone 2.0, which the user steers over the helicopter's own Wi-Fi network, can be guided through looping maneuvers and fly as far away as 50 meters at speeds as high as 18 kilometers per hour. The craft can fly about 12 minutes before needing a recharge. The device, made by Parrot, based in Paris, costs &#x20ac;300 in Europe. Parrot has sold more than 250,000 of the drones since it was introduced in 2010. This is a more complete version of the story than the one that appeared in print. http : // www.nytimes.com/2012/12/10/technology/robotic-gadgets-are-becoming-within-reach-of-average-consumer.html Load-Date: December 10, 2012 End of Document Sign of Retreat The New York Times

Time: 07/12/2002  
word processing, spread sheet analysis, and other computer programs for the office first became available, managers loudly applauded their arrival - and promptly delegated their use to staff members and secretaries. That has not changed much over the years. A large number of executives still prefer to keep their distance from a personal computer keyboard, and their coolness limits sales of the machines. In the last several months, though, new software has surfaced that takes a shot at overcoming the managerial reluctance to step personally into the computer age. Many of these new programs are ''knowledge-based'' - so called because they permit an executive to tap into compendiums of rules and suggestions for how to handle specific situations, much in the way that some of the popular ''how to'' books might do. They deal with negotiating skills, training, strategic planning and other areas that managers cannot delegate. And they have been written for desktop computers. ''These programs get at the essence of what a manager does,'' said Jack B. Levine, president of Thoughtware Inc., a new company in Coconut Grove, Fla., that offers 14 managerial programs. ''The benefits are not ephemeral. They are real, and that should give people the motivation to use them.'' Mr. Levine is hardly a disinterested observer, of course, and it is hard to gauge how well the new software is selling. Future Computing Inc., a market research concern that covers the personal computer industry, has just begun to track managerial programs as a separate category. Software distributors are not forthcoming with either current figures or projections. And most of the companies selling the programs - the leaders are Thoughtware, Human Edge Software, Lightyear, Analytica, and Decision Support Software - are new and privately held, so analysts do not follow their fortunes. But the activity at the Human Edge and Thoughtware booths at the sprawling Comdex personal computer trade show in Las Vegas last month showed that managerial software certainly is piquing interest. Browsers seemed to be able to learn how to use the programs within 20 minutes, and many were impressed enough to buy. Human Edge said it booked nearly $500,000 in sales at the show alone, while Thoughtware claimed that its bookings from Comdex topped $1 million. A more recent informal check of the five leaders in the fledgling field indicated that sales of the new type of software will approach $25 million this year. The companies together projected combined sales of nearly $60 million in 1985. Thoughtware alone is forecasting sales of $20 million in 1985, up from about $8 million this year. The company's Mr. Levine maintains that many of the programs can obviate the need for off- site management training programs or outside consultants, and that once businessmen discover this, the market for all types of managerial software will explode to $1 billion annually. But many computer experts say that a major drawback with much of the managerial software on the market today is that users cannot ask the program how it reached its conclusions, and thus can neither make an independent evaluation of the computer's suggestions nor replicate the process on their own. For example, Human Edge's Expert-Ease program incorporates data about people who have been successful at their jobs, and then extrapolates a pattern of rules for how they operate. For instance, a bank lending officer may describe a series of profitable loans made over the years. The program may notice that he always turned away business in Ohio, and highlight that as a rule for a good loan officer. But the program does not explain why this particular loan officer has done well by avoiding Ohio. And since there are undoubtedly any number of successful loan officers operating in that state, the information may not be very useful without the explanation. But Donald Michie, a researcher in artificial intelligence who developed Expert-Ease, said he already is working on advanced versions that will be able to carry on ''discussions'' with users within a few years. Many computer experts project that software capable of demonstrating its reasoning power - in other words, programs that truly represent artificial intelligence - will be available by the end of the decade. And, they say, managers are likely to snap them up. Such interactive managerial software ''is hardly a fad,'' said Craig C. Lundberg, a management professor at the University of Southern California. ''These programs have made a jump-shift to the point where users are not just responsive but can create their own designs. What we are seeing is not au courant yet, but it will be.'' THE concept of knowledge-based managerial software is not new, but until recently these programs have been limited to large mainframe computers. Most big companies have had mainframes for years, and enterprising programmers, working with in-house strategic and financial planners as well as human resource executives, have often written programs that ask the computer to use historical corporate data to make recommendations for current decisions. For example, a growing number of huge companies are feeding executive resumes into their computers, and using programs that will kick out the names of employees - often in remote, forgotten locations of the company - who have the skills and qualifications required for positions that have opened up at other divisions. But until recently, most such programs were homegrown, and utilized only the data built up by a particular company. The new breed of managerial programs uses data bases that incorporate the knowledge and recommendations of a host of experts in various fields. They are designed for PC's and they are relatively inexpensive, ranging from about $250 to $700. Thus, they are within reach of the small-business man who lacks the resources to develop such programs independently. For example, Human Edge has five programs that sell between $50 and $295 each, and draw extensively from published literature in psychology dealing with the relationships of managers and their staffs, sales representatives and customers, and people engaged in negotiations. ''With all the research that has been done for years, there is no reason why more people can't get in on the game,'' said James H. Johnson, Human Edge's president. Managers using Human Edge's programs, which carry such names as the Negotiating Edge, the Sales Edge, and the Management Edge, are asked to plug in data about themselves and the people they will be dealing with. The program comes back with suggestions on how the manager can get the upper hand in specific situations with these people. For example, someone using Negotiating Edge would be asked to agree or disagree with more than 50 statements. A few samples: ''Fair play is a losing strategy,'' ''I would rather travel than have a desk job'' and ''Others on the job count on me to stir up some action.'' Next, the user describes the person with whom he or she is about to negotiate. To do this, the user agrees or disagrees with each of more than 40 adjectives such as manipulative, empathetic, precise and double-dealing. Lastly, there are a few questions about the circumstances of the meeting, such as whether others will be present, how much time will be available and whether the two main players will ever bargain with each other again. After the data is entered, the program generates a 2,500-word character analysis of the person with whom the manager will negotiate and it suggests ways in which the user can get the best of the meeting. One of Human Edge's customers, Joanne Borger, a Ph.D. psychologist and owner of a psychological testing service in Dallas, used a program recently to seek insights into dealing with an adversary in a civil suit. She declined to disclose what her personal computer told her, or even what the suit was about, but she does say she wound up with a nice psychological advantage in court, although the suit is still undecided. ''This program is incredibly well put together,'' she said. IN any case, the programs appear to be catching on. Such big companies as American Can, Sperry Univac, and Tymshare, a unit of the McDonnell Douglas Corporation, said they are Human Edge customers. For example, Jack Hildner, vice president and general manager of American Can's beverage packing division, has bought several programs for use mainly by his sales staff and labor relations specialists. One, the Management Edge, he uses himself. He said that many of the insights the program provides are ''intuitively obvious to somebody who has been managing people for several years.'' But it also delivers ''some different ways of looking at problems that you might not have considered before,'' he said. Human Edge is the most psychologically oriented of the new software houses. Its chairman and principal founder is Ronald Dozoretz, a psychiatrist in Norfolk, Va., who put up $700,000 of the seed money. Mr. Johnson, the president, is a onetime salesman for the International Business Machines Corporation and a former psychology professor at the Illinois Institute of Technology. He put up $100,000. The Lang Capital Corporation, a venture capital company, provided $1.5 million for research on new programs. Human Edge is projecting $5 million in sales this year, and says it will triple that amount next year. Most of the other new managerial software companies are focusing more on programs that manipulate numbers and statistics to help set tactics for carrying out strategic plans. Not surprisingly, their founders are generally computer experts and businessmen. Thoughtware, for example, was started last year with $3.1 million from the Alexander Proudfoot Companies, a Chicago management consulting firm. Other investors, including Lazard Freres, Barclays Bank and the North American Insurance Company, have since pumped in another $5.4 million. Mr. Levine, the company's founder, holds a Ph.D. in economics and computer science. Francis X. Mahoney, a senior Thoughtware executive, was formerly director of the Exxon Corporation's management development program. Thoughtware's programs are designed to advise managers on specific aspects of their jobs. Its Trigger program, introduced last month, lets managers feed their goals into the computer, and retrieve guidelines on how to best reach those goals. ''The program takes the strategy that you give it and forces you to follow it, or make adjustments to your plan,'' said Allen Sneider, a partner and computer services specialist for Laventhol & Horwath, a national accounting concern. ''If you don't include all of the data you need that is related to the plan's controls, the program will tell you to get it.'' In addition, it will automatically spit forth memos and other communications when certain milestones in the strategic plan are hit, or will warn a manager to take action if a goal is missed. Both Lightyear, a Santa Clara, Calif., company, and Decision Support Software of McLean, Va., offer programs that follow logic somewhat similar to Trigger's. They let the user feed in specific goals and then chart the optimum course that would lead to realization of those goals - even for something as mundane as picking a car to buy. That program, which contains a great deal of technical data about American and foreign cars, would ask the user to list a large number of different vehicles he or she is considering, and then weigh the importance of a host of criteria for choosing a model. If speed, handling and comfort come in as the most important factors, the list of recommendations would include BMW and Porsche. If the user puts a higher weight on low price and maintenance costs, Dodge or Honda would top the list. The program will also give the user a summary of its reasoning in arriving at its decisions of proper models to buy. Few, if any, analysts are predicting a shakeout among the handful of small companies now marketing managerial software, given the potential market of millions of American executives. But neither do they predict vast profitability for the next few years. The new companies ''are pioneering software that could be very popular in five years,'' said Robert M. Lefkowits, a software analyst with Infocorp., a computer research concern in Cupertino, Calif. ''If they keep their goals realistic, I think a number of these companies can stay around. But right now, there isn't a mass market. It's a 'missionary' sell.'' Graphic photo of James Johnson End of Document TECHNOLOGY; Some Colleges Take Games Seriously The New York Times

Time: 28/08/2014  
Sometimes, figuring out the right question is harder than finding the answer. Just ask Watson. Watson's claim to fame rests on beating human champions in the question-and-answer game "Jeopardy!" In the three years since, IBM has been working to move Watson into the marketplace, step by step. The next step came on Thursday, when the company made a Watson technology, Discovery Advisor, available for companies and research organizations to use as a cloud service. In fact, IBM announced Watson Discovery Advisor back in January. But now, John Gordon, vice president for strategy and product commercialization for Watson, said, "We're ready to open this up." The new service builds on Watson's turbocharged text-mining and identification technology, which was so impressively on display in its "Jeopardy!" triumph. In its current version, Discovery Advisor is tuned for science, specifically the life sciences and medicine. Beyond mining text, the discovery tool not only finds connections among words but also links related concepts together to generate hypotheses. What might be the right place to look? What path of scientific inquiry is most likely to yield new knowledge? "Before, the answer was there, and the challenge for Watson was really just to find it," said W. Scott Spangler, a data scientist at IBM's Almaden Research Center in San Jose, Calif. "But this is about what's the right question for the scientist to ask." A strong case for the power of the Watson technology was made in a research paper published this week and presented at the Association for Computing Machinery's annual conference that focuses on knowledge discovery and data-mining - what we now call data science. Mr. Spangler is one of several researchers from IBM, the Baylor College of Medicine and the MD Anderson Cancer Center in Houston who are co-authors on the paper, " Automated Hypothesis Generation Based on Mining Scientific Literature." In the research project, biologists and data scientists used Watson to identify proteins that modify p53, a crucial protein that is sometimes called "the guardian of the genome." When p53 is mutated, it can set the stage for tumor growth of many kinds of cancer. It is a most popular subject of research. More than 70,000 papers have been published on p53. Watson read them all in an automated effort to predict proteins that turn p53's activity on or off. Using Watson's analysis, the cancer researchers identified six potential proteins to target for new research. Watson went beyond digging for a known fact; it found previously unrecognized connections. The predictions were then tested in biology laboratory experiments. "Some of the things that were predicted turned out to be true, at least in preliminary experiments," said Dr. Olivier Lichtarge, director of Baylor's Center of Computational and Integrative Biomedical Research. "We've shown that this technology can mine scientific literature and reason about it in molecular biology." Dr. Lichtarge pointed to the efficiency of the automated system, and its potential to accelerate scientific discovery, by observing that a scientist might read five research papers a day at most. Even at that pace, he noted, it would take a human scientist nearly 38 years to read the more than 70,000 papers available today on p53. Hastening the pace of discovery should open the door to more effective drugs and other therapies. IBM is by no means the only technology company applying the tools of artificial intelligence to try to create the equivalent of smart digital assistants. In the consumer market, there is Apple's Siri, Google's Now and Microsoft's Cortana. In the corporate market, there is less emphasis on having the software talk to users, but the underlying principle is similar, said David Schubmehl, an analyst at IDC. He singled out Palantir Technologies, Digital Reasoning and Saffron Technology among those pursuing the same market opportunity as IBM's Watson. "The technology in this field is rapidly improving, but we're in the early days," Mr. Schubmehl said. How early it is for Watson and how large the payoff might be for the company is uncertain. In January, IBM placed Watson in its own business unit, with new offices in the East Village in Manhattan and a pledge to spend $1 billion on Watson. The financial commitment includes $100 million for a venture fund to support start-ups and entrepreneurs making applications that run on the Watson artificial intelligence software. The goal is that Watson will be not just a product but a so-called platform on which other technology and businesses are built. Operating systems like Microsoft's Windows, Apple's iOS and Google's Android are classic technology platforms, and IBM aspires to make Watson an artificial intelligence operating system. "The platform strategy for Watson is very smart," said Tom Austin, an analyst for Gartner. "But I'm waiting for evidence that there is action on the entrepreneurial side - lots of businesses and developers making Watson-based products and trying to make money off it." An IBM spokeswoman said the company had "hundreds of clients and partners with active projects" using the Watson technology. The IBM research project with the Baylor College of Medicine shed some light on both the hurdles and the opportunity for Watson. Its artificial intelligence software may blitz through thousands of scientific papers in minutes, but only after it was trained to identify medical terms, discern concepts and make connections. Mr. Spangler said he spent two years working with the Baylor researchers. The software that brought success was an application based on Watson called the Baylor Knowledge Integration Toolkit or KnIT. Proof-of-concept projects like the one with Baylor are always time-consuming. The goal, though, is that what is learned on early projects can be translated to code that is used again and again. Mr. Gordon, the IBM strategist, is confident that Watson can scale up in "co-creation projects with clients that can transform an industry." Watson's quiz-show triumph gave many people the impression that the technology was a general-purpose artificial intelligence, which could be applied to any field. IBM's early marketing communication did nothing to dampen that enthusiasm. But while Watson 1.0 had general properties, it was designed to win at "Jeopardy!" Could some version of the Watson technology - now a cloud service instead of a hulking computer - be adapted to technically daunting tasks with the potential for a significant payoff in insights and dollars? "That question pinpoints our key challenge," Mr. Spangler observed. And the progress shown in the protein-identification project, he added, suggests that the answer may be yes. "This is what makes me most excited," Mr. Spangler said. Load-Date: August 28, 2014 End of Document Facebook's A.I. Growth Squeezes Universities The New York Times

Time: 18/08/2014  
Just as the Big Bad Wolf promised Little Red Riding Hood that his bigger eyes were "the better to see you with," a machine's ability to see the world around it is benefiting from bigger computers and more accurate mathematical calculations. The improvement was visible in contest results released Monday evening by computer scientists and companies that sponsor an annual challenge to measure improvements in the state of machine vision technology. Started in 2010 by Stanford, Princeton and Columbia University scientists, the Large Scale Visual Recognition Challenge this year drew 38 entrants from 13 countries. The groups use advanced software, in most cases modeled loosely on the biological vision systems, to detect, locate and classify a huge set of images taken from Internet sources like Twitter. The contest was sponsored this year by Google, Stanford, Facebook and the University of North Carolina. Contestants run their recognition programs on high-performance computers based in many cases on specialized processors called G.P.U.s, for graphic processing units. This year there were six categories based on object detection, locating objects and classifying them. Winners included the National University of Singapore, the Oxford University, Adobe Systems, the Center for Intelligent Perception and Computing at the Chinese Academy of Sciences, as well as Google in two separate categories. Accuracy almost doubled in the 2014 competition and error rates were cut in half, according to the conference organizers. "This year is really what I consider a historical year for the challenge," said Fei-Fei Li, the director of the Stanford Artificial Intelligence Laboratory and one of the creators of a vast set of labeled digital images that is the basis for the contest. "What really excites us is that performance has taken a huge leap." Despite the fact that contest is based on pattern recognition software that can be "trained" to recognize objects in digital images, the contest itself is made possible by the Imagenet database, an immense collection of more than 14 million images that have been identified by humans. The Imagenet database is publicly available to researchers at http : // image-net.org/. In the five years that the contest has been held, the organizers have twice, once in 2012 and again this year, seen striking improvements in accuracy, accompanied by more sophisticated algorithms and larger and faster computers. In 2012 the contest was won by Geoffrey E. Hinton, a cognitive scientist at the University of Toronto, and two of his students. Mr. Hinton is a pioneer in the field of artificial neural networks, and in 2013 he joined Google with his students Alex Krizhevsky and Ilya Sutskever. This year the entrants had the option of either disclosing the details of their algorithms or keeping them proprietary, and all of the winning groups chose to share details of their technical innovations. That was significant, according to Dr. Li, because it is possible to move quickly from research to commercial applications. Machine vision has countless applications, including computer gaming, medical diagnosis, factory robotics and automotive safety systems. Recently a number of carmakers have added the ability to recognize pedestrians and bicyclists and stop automatically without driver intervention. "We see innovation and creativity exploding," she said. "The algorithms are more complex and they are just more interesting." This year almost all of the entrants used a variant of an approach known as a convolutional neural network, an approach first refined in 1998 by Yann LeCun, a French computer scientist who recently became director of artificial intelligence research at Facebook. "This is LeCun's hour," said Gary Bradski, an artificial intelligence researcher who was the founder of Open CV, a widely used machine vision library of software tools. Convolutional neural networks have only recently begun to have impact because of the sharply falling cost of computing, he said, "In the past there were a lot of things people didn't do because no one realized there would be so much inexpensive computing power available." The accuracy results this year improved to 43.9 percent, from 22.5 percent, and the error rate fell to 6.6 percent, from 11.7 percent, according to Olga Russakovsky, a Stanford University graduate researcher who is the lead organizer for the contest. Since the Imagenet Challenge began in 2010, the classification error rate has decreased fourfold, she said. Despite the increases in computer vision accuracy, the systems still cannot match human vision, according to the researchers. "Human-level understanding is much deeper than machine image classification," she said. "I can easily find a image that will fool the algorithm and I can't do it with humans, but we're making significant progress." Although machines have made great progress in object recognition, they are only taking baby steps in what scientists describe as "scene understanding," the ability to comprehend what is happening in an image in human language. "I really believe in the phrase that 'a picture is worth a thousand words,' not a thousand disconnected words," said Dr. Li. "It's the ability to tell a complete story. That is the holy grail." Load-Date: August 18, 2014 End of Document Sarah Wallace, Ian Schwartz The New York Times

Time: 18/11/2014  
Calif. -- Two groups of scientists, working independently, have created artificial intelligence software capable of recognizing and describing the content of photographs and videos with far greater accuracy than ever before, sometimes even mimicking human levels of understanding. Until now, so-called computer vision has largely been limited to recognizing individual objects. The new software, described on Monday by researchers at Google and at Stanford University, teaches itself to identify entire scenes: a group of young men playing Frisbee, for example, or a herd of elephants marching on a grassy plain. The software then writes a caption in English describing the picture. Compared with human observations, the researchers found, the computer-written descriptions are surprisingly accurate. The advances may make it possible to better catalog and search for the billions of images and hours of video available online, which are often poorly described and archived. At the moment, search engines like Google rely largely on written language accompanying an image or video to ascertain what it contains. ''I consider the pixel data in images and video to be the dark matter of the Internet,'' said Fei-Fei Li, director of the Stanford Artificial Intelligence Laboratory, who led the research with Andrej Karpathy, a graduate student. ''We are now starting to illuminate it.'' Dr. Li and Mr. Karpathy published their research as a Stanford University technical report. The Google team published their paper on arXiv.org, an open source site hosted by Cornell University. In the longer term, the new research may lead to technology that helps the blind and robots navigate natural environments. But it also raises chilling possibilities for surveillance. During the past 15 years, video cameras have been placed in a vast number of public and private spaces. In the future, the software operating the cameras will not only be able to identify particular humans via facial recognition, experts say, but also identify certain types of behavior, perhaps even automatically alerting authorities. Two years ago Google researchers created image-recognition software and presented it with 10 million images taken from YouTube videos. Without human guidance, the program trained itself to recognize cats -- a testament to the number of cat videos on YouTube. Current artificial intelligence programs in new cars already can identify pedestrians and bicyclists from cameras positioned atop the windshield and can stop the car automatically if the driver does not take action to avoid a collision. But ''just single object recognition is not very beneficial,'' said Ali Farhadi, a computer scientist at the University of Washington who has published research on software that generates sentences from digital pictures. ''We've focused on objects, and we've ignored verbs,'' he said, adding that these programs do not grasp what is going on in an image. Both the Google and Stanford groups tackled the problem by refining software programs known as neural networks, inspired by our understanding of how the brain works. Neural networks can ''train'' themselves to discover similarities and patterns in data, even when their human creators do not know the patterns exist. In living organisms, webs of neurons in the brain vastly outperform even the best computer-based networks in perception and pattern recognition. But by adopting some of the same architecture, computers are catching up, learning to identify patterns in speech and imagery with increasing accuracy. The advances are apparent to consumers who use Apple's Siri personal assistant, for example, or Google's image search. Both groups of researchers employed similar approaches, weaving together two types of neural networks, one focused on recognizing images and the other on human language. In both cases the researchers trained the software with relatively small sets of digital images that had been annotated with descriptive sentences by humans. After the software programs ''learned'' to see patterns in the pictures and description, the researchers turned them on previously unseen images. The programs were able to identify objects and actions with roughly double the accuracy of earlier efforts, although still nowhere near human perception capabilities. ''I was amazed that even with the small amount of training data that we were able to do so well,'' said Oriol Vinyals, a Google computer scientist who wrote the paper with Alexander Toshev, Samy Bengio and Dumitru Erhan, members of the Google Brain project. ''The field is just starting, and we will see a lot of increases.'' Computer vision specialists said that despite the improvements, these software systems had made only limited progress toward the goal of digitally duplicating human vision and, even more elusive, understanding. ''I don't know that I would say this is 'understanding' in the sense we want,'' said John R. Smith, a senior manager at I.B.M.'s T.J. Watson Research Center in Yorktown Heights, N.Y. ''I think even the ability to generate language here is very limited.'' But the Google and Stanford teams said that they expect to see significant increases in accuracy as they improve their software and train these programs with larger sets of annotated images. A research group led by Tamara L. Berg, a computer scientist at the University of North Carolina at Chapel Hill, is training a neural network with one million images annotated by humans. ''You're trying to tell the story behind the image,'' she said. ''A natural scene will be very complex, and you want to pick out the most important objects in the image.'' http : // www.nytimes.com/2014/11/18/science/researchers-announce-breakthrough-in-content-recognition-software.html Graphic PHOTO: Researchers at Google and Stanford have developed software that can accurately describe the content of images. The computer caption: ''A group of young people playing a game of Frisbee.'' Load-Date: November 18, 2014 End of Document Google Workers Protest Secrecy In China Project The New York Times

Time: 08/12/2009  
The personal computer and the technologies that led to the Internet were largely invented in the 1960s and '70s at three computer research laboratories next to the Stanford University campus. One laboratory, Douglas Engelbart's Augmentation Research Center, became known for the mouse; a second, Xerox's Palo Alto Research Center, developed the Alto, the first modern personal computer. But the third, the Stanford Artificial Intelligence Laboratory, or SAIL, run by the computer scientist John McCarthy, gained less recognition. That may be because SAIL tackled a much harder problem: building a working artificial intelligence system. By the mid-1980s, many scientists both inside and outside of the artificial intelligence community had come to see the effort as a failure. The outlook was more promising in 1963 when Dr. McCarthy began his effort. His initial proposal, to the Advanced Research Projects Agency of the Pentagon, envisioned that building a thinking machine would take about a decade. Four and a half decades later, much of the original optimism is back, driven by rapid progress in artificial intelligence technologies, and that sense was tangible last month when more than 200 of the original SAIL scientists assembled at the William Gates Computer Science Building here for a two-day reunion. During their first 10 years, SAIL researchers embarked on an extraordinarily rich set of technical and scientific challenges that are still on the frontiers of computer science, including machine vision and robotic manipulation, as well as language and navigation. In 1966, the laboratory took up residence in the foothills of the Santa Cruz Mountains behind Stanford in an unfinished corporate research facility that had been intended for a telecommunications firm. The atmosphere, however, was anything but button-down corporate. The antiwar movement and the counterculture were in full swing, and the lab reflected the widely disparate political views and turmoil of the time. Dr. McCarthy was a committed leftist who would gradually move to the right during the '60s; Les Earnest, the laboratory's deputy director, who had worked in government intelligence, would move to the left. The graduate students soon discovered the building's attic and took up residence there. Mr. Earnest found a clever way, known in the parlance of the A.I. community as a ''hack,'' to pay for a sauna in the basement of the building, and because many of the young researchers were devotees of Tolkien's ''Lord of the Rings,'' they created a special font in Elvish and used it to identify offices as places from Middle Earth. The scientists and engineers who worked at the laboratory constitute an extraordinary Who's Who in the computing world. Dr. McCarthy coined the term artificial intelligence in the 1950s. Before coming to SAIL he developed the LISP programming language and invented the time-sharing approach to computers. Mr. Earnest designed the first spell-checker and is rightly described as the father of social networking and blogging for his contribution of the finger command that made it possible to tell where the laboratory's computer users were and what they were doing. Among others, Raj Reddy and Hans Moravec went on to pioneer speech recognition and robotics at Carnegie Mellon University. Alan Kay brought his Dynabook portable computer concept first to Xerox PARC and later to Apple. Larry Tesler developed the philosophy of simplicity in computer interfaces that would come to define the look and functioning of the screens of modern Apple computers -- what is called the graphical user interface, or G.U.I. Don Knuth wrote the definitive texts on computer programming. Joel Pitts, a Stanford undergraduate, took a version of the Space War computer game and turned it into the first coin-operated video game -- which was installed in the university's student coffee house -- months before Nolan Bushnell did the same with Atari. The Nobel Prize-winning geneticist Joshua Lederberg worked with Edward Feigenbaum, a computer scientist, on an early effort to apply artificial intelligence techniques to create software to act as a kind of medical expert. John Chowning, a musicologist, referred to SAIL as a ''Socratean abode.'' He was invited to use the mainframe computer at the laboratory late at night when the demand was light, and his group went on to pioneer FM synthesis, a technique for creating sounds that transforms the quality, or timbre, of a simple waveform into a more complex sound. (The technique was discovered by Dr. Chowning at Stanford in 1973 and later licensed to Yamaha.) The laboratory merged with the computer science department at Stanford in 1980, reopened in 2004, and is now enjoying a renaissance. Its trajectory can be seen in the progress made since 1970, when a graduate researcher programmed a robot to automatically follow a white line under controlled lighting conditions at eight-tenths mile per hour. Thirty-five years later, a team of artificial intelligence researchers at Stanford would equip a Volkswagen Touareg named Stanley with lasers, cameras and a cluster of powerful computers to drive autonomously for 131 miles over mountain roads in California at an average speed of 19.1 miles per hour to win $2 million in the 2005 Darpa Grand Challenge, a robotic vehicle contest. ''We are a first-class citizen right now with some of the strongest recent advances in the field,'' said Sebastian Thrun, a roboticist who is the director of SAIL and was one of the leaders of the Stanley team. The reunion also gave a hint of what is to come. During an afternoon symposium at the reunion, several of the current SAIL researchers showed a startling video called ''Chaos'' taken from the Stanford Autonomous Helicopter project. An exercise in machine learning, the video shows a model helicopter making a remarkable series of maneuvers that would not be possible by a human pilot. The demonstration is particular striking because the pilot system first learned from a human pilot and then was able to extend those skills. But an artificial intelligence? It is still an open question. In 1978, Dr. McCarthy wrote, ''human-level A.I. might require 1.7 Einsteins, 2 Maxwells, 5 Faradays and .3 Manhattan Projects.'' http : // www.nytimes.com Graphic PHOTO: IN THE BEGINNING: John McCarthy, who ran the Stanford Artificial Intelligence Laboratory, at a reunion last month in California, seated between, from left, Bruce Buchanan and Vic Scheinman. Standing are, from left, Ralph Gorin, Whit Diffie, Dan Swinehart, Tony Hearn, Larry Tesler and Lynn Quam. (PHOTOGRAPH BY JOHN MARKOFF) Load-Date: December 8, 2009 End of Document Pursuing the Next Level Of Artificial Intelligence The New York Times

Time: 10/01/2010  
Catalog'' from Thinking Software is a wonderful potpourri of programs for all personal computer users, from the rawest beginner to the experienced DOS jockey, including those who are just out for a good time. There are expert systems, natural language systems, neural network software - all categories familiar to those who try to program computers to demonstrate Artificial Intelligence (AI) and to those who are content to buy such programs off the shelf. PC Therapist, for example, is a cousin of Eliza, the decades-old program in which your computer appears to listen sympathetically to your problems. Eliza was primitive, although it fooled some intelligent people; today's more powerful MS-DOS computers let PC Therapist carry on a more varied conversation, but like Eliza, it doesn't give a hoot what you say. PERIPHERALS; Artificial Intelligence On a more serious level, the Psychologist embodies real psychological knowledge and the kind of rules of thumb that professionals use in an attempt to provide genuine help. It is not, of course, a substitute for human help for those who need it. Then there are programs like the Stock Market Expert, the Investment Expert, the Race Track Expert and the Lotto Expert, each of which suggest ways to make money. Anyone who could write a program that was a consistent winner would be quietly making millions with it, not selling it for $30 a disk, but the same may be said of human advisers. And there are the frankly frivolous entries. If you install Crumble on a friend's computer, when he tries to end a program he will watch the characters on the screen ''start to slowly crumble one by one into a pile of junk on the bottom of the screen in agonizing slow motion.'' No permanent damage is done, except, possibly, to your nose by your former friend. And there's Funny DOS, in which any disk commands results in the message ''Now Formatting Drive C,'' which means the hard disk is being erased. The catalogue has a section on neural network software, in which the binary circuits of the computer mimic, in a very limited way, the neuron-and-axon structure of the brain. Software written under such an arrangement can appear to learn from experience. Most of the programs are $29.95; a few range up to $195. Most can be bought in six-packs for $99.95. For a demonstration disk and catalogue, send a 9-by-12-inch self-addressed, stamped envelope (postage is $1) to Thinking Software, 46-16 65th Place, Woodside, N.Y. 11377. Three books arrived too late to be included in April 18's rundown of new and updated works on MS-DOS. Two of them are standards in the field, and the third is an offshoot. ''Running MS-DOS, fourth edition,'' by Van Wolverton (Microsoft Press, Redmond, Wash.; $22.95 in soft covers), has has sold more than a million copies in its previous incarnations. The new edition adds information on MS-DOS version 4, the latest. For beginners and experts alike, it combines a reference work with a command-by-command series of lessons in the operating system. ''Supercharging MS-DOS, second edition,'' also by Van Wolverton (Microsoft Press; $19.95 in soft covers), has been updated, too. Intended for advanced users who have mastered the instructions covered in ''Running MS-DOS,'' it is also sold with a 5.25-inch disk containing the book's programs for $34.95. The diskless version includes a coupon for ordering either a 5.25- or 3.5-inch disk. The offshoot is ''MS-DOS Commands,'' also by the prolific Mr. Wolverton (Microsoft Press; $5.95 in soft covers), a pocket-sized 100-page reference to refresh your memory of DOS commands and their syntax. End of Document Behind Artificial Intelligence, a Squadron of Bright Real People The New York Times

Time: 21/01/2010  
Technocel, an electronic accessories company, introduced what it calls the Ear Vibe, ''the first stereo headset that vibrates to the beat of your music'' at the Consumer Electronics Show. The $30 earbud-style headphones begin to move a bit when they encounter low-frequency notes. It's kind of a makeshift bass enhancement. Perhaps it's somewhat coincidental that at the same trade show, Sennheiser, which makes audio accessories, displayed a new line of headphones that it had developed with Adidas. One of its selling points, Sennheiser says, is that the products ''are insensitive to vibration.'' Go figure. For a more upscale version, serious listeners might consider Sony's latest effort in noise-canceling technology: the Sony MDR-NC300D Digital Noise Canceling Earbuds, priced at a budget-canceling $300. The tweak with Sony's headphones is artificial intelligence, which automatically selects the optimal noise cancellation mode based on the outside environment, like a plane, a train or an office. The headphones, which will run for about 20 hours on an AA battery, come with a variety of fittings to accommodate up to seven different sizes of ears. They will be available in February. STEPHEN WILLIAMS http : // www.nytimes.com Graphic PHOTOS Load-Date: January 21, 2010 End of Document Artificial Intelligence For the New Millennium; A Revolution More Bland Than Kubrick's '2001' The New York Times

Time: 06/12/2011  
Ever since the early days of modern computing in the 1940s, the biological metaphor has been irresistible. The first computers -- room-size behemoths -- were referred to as ''giant brains'' or ''electronic brains,'' in headlines and everyday speech. As computers improved and became capable of some tasks familiar to humans, like playing chess, the term used was ''artificial intelligence.'' DNA, it is said, is the original software. For the most part, the biological metaphor has long been just that -- a simplifying analogy rather than a blueprint for how to do computing. Engineering, not biology, guided the pursuit of artificial intelligence. As Frederick Jelinek, a pioneer in speech recognition, put it, ''airplanes don't flap their wings.'' Yet the principles of biology are gaining ground as a tool in computing. The shift in thinking results from advances in neuroscience and computer science, and from the prod of necessity. The physical limits of conventional computer designs are within sight -- not today or tomorrow, but soon enough. Nanoscale circuits cannot shrink much further. Today's chips are power hogs, running hot, which curbs how much of a chip's circuitry can be used. These limits loom as demand is accelerating for computing capacity to make sense of a surge of new digital data from sensors, online commerce, social networks, video streams and corporate and government databases. To meet the challenge, without gobbling the world's energy supply, a different approach will be needed. And biology, scientists say, promises to contribute more than metaphors. ''Every time we look at this, biology provides a clue as to how we should pursue the frontiers of computing,'' said John E. Kelly, the director of research at I.B.M. Dr. Kelly points to Watson, the question-answering computer that can play ''Jeopardy!'' and beat two human champions earlier this year. I.B.M.'s clever machine consumes 85,000 watts of electricity, while the human brain runs on just 20 watts. ''Evolution figured this out,'' Dr. Kelly said. Several biologically inspired paths are being explored by computer scientists in universities and corporate laboratories worldwide. But researchers from I.B.M. and four universities -- Cornell, Columbia, the University of Wisconsin, and the University of California, Merced -- are engaged in a project that seems particularly intriguing. The project, a collaboration of computer scientists and neuroscientists begun three years ago, has been encouraging enough that in August it won a $21 million round of government financing from the Defense Advanced Research Projects Agency, bringing the total to $41 million in three rounds. In recent months, the team has developed prototype ''neurosynaptic'' microprocessors, or chips that operate more like neurons and synapses than like conventional semiconductors. But since 2008, the project itself has evolved, becoming more focused, if not scaled back. Its experience suggests what designs, concepts and techniques might be usefully borrowed from biology to push the boundaries of computing, and what cannot be applied, or even understood. At the outset, Dharmendra S. Modha, the I.B.M. computer scientist leading the project, described the research grandly as ''the quest to engineer the mind by reverse-engineering the brain.'' The project embarked on supercomputer simulations intended to equal the complexity of animal brains -- a cat and then a monkey. In science blogs and online forums, some neuroscientists sharply criticized I.B.M. for what they regarded as exaggerated claims of what the project could achieve. These days at the I.B.M. Almaden Research Center in San Jose, Calif., there is not a lot of talk of reverse-engineering the brain. Wide-ranging ambitions that narrow over time, Dr. Modha explained, are part of research and discovery, even if his earlier rhetoric was inflated or misunderstood. ''Deciding what not to do is just as important as deciding what to do,'' Dr. Modha said. ''We're not trying to replicate the brain. That's impossible. We don't know how the brain works, really.'' The discussion and debate across disciplines has helped steer the research, as the team pursues the goals set out by Darpa, the Pentagon's research agency. The technology produced, according to the guidelines, should have the characteristics of being self-organizing, able to ''learn'' instead of merely responding to conventional programming commands, and consuming very little power. ''We have this fantastic network of specialists who talk to each other,'' said Giulio Tononi, a psychiatrist and neuroscientist at the University of Wisconsin. ''It focuses our thinking as neuroscientists and guides the thinking of the computer scientists.'' In early 2010, Dr. Modha made a decision that put the project on its current path. While away from the lab for a few weeks, because of a Hawaiian vacation and a bout of flu, he decided to streamline the work of the far-flung researchers. The biologically inspired chip under development would come first, Dr. Modha said. That meant a lot of experimental software already written was scrapped. But, he said, ''chip-first as an organizing principle gave us a coherent plan.'' In designing chips that bear some structural resemblance to the brain, so-called neuromorphic chips, neuroscience was a guiding principle as well. Brains are low-power, nimble computing mechanisms -- real-world proof that it is possible. A brain does its computing with a design drastically different from today's computers. Its processors -- neurons -- are, in computing terms, massively distributed; there are billions in a human brain. These neuron processors are wrapped in its data memory devices -- synapses -- so that the brain's paths of communication are extremely efficient and diverse, through the neuron's axons, which conduct electrical impulses. A machine that adopts that approach, Dr. Modha said, would represent ''a crucial shift away from von Neumann computing.'' He was referring to a design with processor and memory physically separated and connected by a narrow communications channel, or bus, and operating according to step-by-step sequential methods -- the von Neumann architecture used in current computers, named after the mathematician John von Neumann. The concept of neuromorphic electronic systems is more than two decades old; Carver Mead, a renowned computer scientist, described such devices in an engineering journal article in 1990. Earlier biologically inspired devices, scientists say, were mostly analog, single-purpose sensors that mimicked one function, like an electronic equivalent of a retina for sensing image data. But the I.B.M. and university researchers are pursuing a more versatile digital technology. ''It seems that we can build a computing architecture that is quite general-purpose and could be used for a large class of applications,'' said Rajit Manohar, a professor of electrical and computer engineering at Cornell University. What might such applications be, 5 or 10 years from now, if the technology proves successful? They would be the sorts of tasks that humans find effortless and that computers struggle with -- the pattern recognition of seeing and identifying someone, walking down a crowded sidewalk without running into people, learning from experience. Specifically, the scientists say, the applications might include robots that can navigate a battlefield environment and be trained; low-power prosthetic devices that would allow blind people to see; and computerized health-care monitors that watch over people in nursing homes and send alerts to human workers if a resident's behavior suggests illness. It is an appealing vision, but there are formidable obstacles. The prototype chip has 256 neuron-like nodes, surrounded by more than 262,000 synaptic memory modules. That is impressive, until one considers that the human brain is estimated to house up to 100 billion neurons. In the Almaden research lab, a computer running the chip has learned to play the primitive video game Pong, correctly moving an on-screen paddle to hit a bouncing cursor. It can also recognize numbers 1 through 10 written by a person on a digital pad -- most of the time. But the project still has a long way to go. It is still questionable whether the scientists can successfully assemble large clusters of neuromorphic chips. And though the intention is for the machines to evolve more from learning than from being programmed, the software that performs that magic for any kind of complex task has yet to be written. The project's Pentagon sponsor is encouraged. ''I'm surprised that we're so far along, and I don't see any fundamental reason why it can't be done,'' said Todd Hylton, a program manager. If it succeeds, the project would seem to make peace with the ''airplanes don't flap their wings'' critique. ''Yes, they are different, but bird wings and plane wings both depend on the same aerodynamic principles to get lift,'' said Christopher T. Kello, director of the Cognitive Mechanics Lab at the University of California, Merced. ''It's the same with this project. You can use essential design elements from biology.'' http : // www.nytimes.com Graphic PHOTO: BIOENGINEERING: Dharmendra S. Modha of I.B.M. leads a team developing chips that structurally resemble the brain. (PHOTOGRAPH BY TONY AVELAR/BLOOMBERG NEWS) Load-Date: December 6, 2011 End of Document Artificial Intelligence The New York Times

Time: 19/08/2013  
what constitutes artificial intelligence has always been a matter of some dispute. And the terms of the argument change with each new advance in computer science. Seen one way, as the effort to produce machines whose output cannot be distinguished from that of a human, artificial intelligence, or A.I., is still very far away. But from another perspective, it is all around us. Thirty years ago, for instance, speech recognition was an artificial-intelligence problem of the first order. Today it is commonplace, a fact that is evident to anyone who has called the United Airlines flight information line or has used speech transcription software. "These things are considered A.I. before you do them," said Dr. Danny Hillis, who has been working in the field for years. "And after you do it, they're considered engineering." Other fruits of artificial intelligence research abound as well. Whether you are struggling to beat your Palm organizer at chess, watching your word processing program correct your spelling or playing a video game, you are witnessing the ways in which artificial intelligence has insinuated itself into daily life. "A.I. is becoming more important as it has become less conspicuous, and it's less conspicuous because it's everywhere, but often under the surface," said Dr. Patrick Winston, a professor at the Massachusetts Institute of Technology who was the director of the Artificial Intelligence Lab there for 25 years. Since the time when the first work was being done by Dr. Marvin Minsky, Dr. John McCarthy, Dr. Winston and others at M.I.T., in the 1950's and 1960's, computer scientists have generally agreed that artificial intelligence would arrive incrementally. "We're engineering A.I. one piece at a time," said Dr. Hillis, a former student of Dr. Minsky's and chairman of Applied Minds, a start-up in Glendale, Calif. Dr. Hillis and others said that the machine intelligence currently in evidence fell along a spectrum. At the less intelligent end are things like smart washing machines and coffeepots -- appliances that can figure out how dirty a load of clothes is or when to turn off a coffee warmer. Experts generally agree that such appliances are the product of rather sophisticated microprocessors and sensors, not evidence of artificial intelligence. At the other end are machines whose output is genuinely difficult to distinguish from a human's, like I.B.M.'s chess-playing computer, Deep Blue, and Aaron, a robotic artist that produces paintings that could easily pass for human work. And somewhere in the middle are speech recognition programs, used in lieu of word processors; collaborative filtering software, like that used by Amazon.com to make purchase recommendations; and search engines that respond to questions phrased in full sentences, not just search terms. One reason for the proliferation of machine intelligence in the commercial world is the seeding of the computer industry with artificial-intelligence researchers who have moved beyond academia and taken jobs at high-tech companies. The Microsoft Corporation, for instance, employs about 80 artificial-intelligence researchers, many of whom came from universities. For several years, Microsoft has sold its Office software with various embedded intelligence features, like the automatic correction of frequently misspelled words and the Answer Wizard, which anticipates the needs of users who look up topics in the electronic documentation. An infamous piece of Microsoft software that includes components of artificial intelligence is the Paper Clip help wizard, which pops up on the screen to offer advice. Many people say Paper Clip pops up too often with unwanted suggestions. In defense of Paper Clip, Dr. Winston said: "It's less annoying than it would have been without A.I. It does try to zero in on what kinds of information you're most interested in, and that sort of thing will get better and better as time goes by." Microsoft's next big step into the marketplace with a product that incorporates artificial intelligence will be its Outlook Mobile Manager, a system that scrutinizes each incoming e-mail message, does an automatic synopsis, throws away extraneous words and abbreviates others, then sends the message to the user's mobile device. The product is scheduled to be released next year. "It's what a great secretary would do," said Craig Mundie, Microsoft's senior vice president for advanced strategies. Researchers in artificial intelligence at Microsoft are also working on a more general effort called the Attentional User Interfaces and Systems Project, which includes a project for continually monitoring streams of data like e-mail, voice mail, Internet news alerts and instant messages. The system will gauge what the computer user is doing, assign priorities to the messages and decide whether and when to interrupt. Other graduates of university-based artificial intelligence programs have started companies of their own. In 1983, Dr. Hillis co-founded the Thinking Machines Corporation, a supercomputer company that was bought by other companies in the 1990's. In 1986, Dr. Winston and three colleagues at M.I.T. started Ascent Technology in Cambridge, Mass., to apply the research they had been doing to help airports solve scheduling and allocation problems like gate assignments for aircraft. Dr. Winston said the first commercialization efforts of artificial intelligence, in the 1980's, had made an obvious mistake. "We blundered about what we thought A.I. was going to be good for, which was replacing people," he said. "What we discovered was that's not the commercial appeal of A.I. It's about making things possible that weren't possible with people alone." As examples, Dr. Winston pointed to a project at the Artificial Intelligence Lab for giving brain surgeons a kind of X-ray vision by coupling video images with M.R.I. images. He also pointed to the Mars Rover, which navigates terrain autonomously. Another M.I.T. spinoff is the iRobot Corporation, started 10 years ago by Dr. Rodney Brooks, the current director of the Artificial Intelligence Lab. The company developed an interactive doll with Hasbro called My Real Baby and in February will begin selling the iRobot-LE, a self-navigating home robot that will be equipped with sonar and a camera and will be controlled via the Web. Of course, there are those who disagree that pieces of the artificial intelligence puzzle are falling into place incrementally. "It's very much like a country that's declaring a war that it's losing to be won and then withdrawing," said Dr. Douglas Lenat, an artificial intelligence researcher who is president of Cycorp in Austin, Tex. By way of example, Dr. Lenat described the shortcomings of speech recognition programs currently on the market. "They are just the palest shadows of what we can, should and soon will have with real A.I.," he said. "You have to speak the punctuation marks, and that's pretty pathetic. And they don't recognize the simplest inflections for things like italics and commas. "There is still this tremendously important problem, which is to get computers to know enough about the world that they can do the final few percentage points of speech recognition." Dr. Lenat's criticism of speech recognition raises the larger question of what constitutes intelligence. Dr. Hillis addressed that question this way: "Intelligence is just a whole lot of little things, thousands of them. And what will happen is we'll learn about each one one at a time, and as we do it, machines will be more and more like people. It will be a gradual process, and that's been happening." Dr. Ray Kurzweil, an artificial intelligence researcher who created the Kurzweil VoiceReport, a speech recognition program, agreed that "machines still do not have the subtlety, depth, range and richness of human intelligence because it is still a million times simpler than the human brain." "That gap," Dr. Kurzweil continued, "is going to go away, and when it does, then machines can combine the subtlety and pattern-recognition strengths with the other natural advantages they already have, and that will be a very formidable combination." Perhaps the flight schedule information line that understands words like "Chicago" and "today" helps take machines a step closer to duplicating the outward signs of a person's intelligence. But the artificial intelligence field remains far short of modeling human consciousness and the inner mind. "A.I. has done a lot of little things that are very powerful," Dr. Winston said. "On the other hand, on the science side, where we try to understand what makes humans work, we're still a long way from that prize, and we need to work hard on it if we want to understand our intelligence the same way molecular biologists understand our genes." The world of artificial intelligence would not be the same without a robotic lawnmower, available for about $800 from Friendly Robotics, which has its United States headquarters in Irving, Tex. Dr. Brooks, of M.I.T., has used the device, called the Robomower, on his own yard in suburban Boston. He said that although it did a respectable job on a patch of lawn, the family gardener's reaction reinforced Dr. Winston's point. "He looked at that third of the lawn and said, 'I guess I'm not out of a job soon,' " Dr. Brooks said. http : // www.nytimes.com Graphic Photos: (Tony Cenicola for The New York Times)(pg. G1); The iRobot Corporation, a spinoff of the Massachusetts Institute of Technology, developed a self-navigating machine for the home that will be controlled via the Web and available in February. (pg. G7) Load-Date: December 28, 2000 End of Document Life After Watson For Researcher The New York Times

Time: 26/10/2011  
The International Business Machines Corporation today announced a three-year multimillion-dollar project in artificial intelligence with Carnegie-Mellon University, as part of what the company called ''a major new I.B.M. initiative'' in advanced software. Under the terms of the agreement, I.B.M. will provide equipment and financing for Carnegie-Mellon researchers developing ''expert systems'' that attempt to simulate human reasoning and draw conclusions, along with longer-range work in speech recognition and robotics. While I.B.M. said it would not have exclusive access to the results of the research, company executives attending the annual meeting of the American Association for Artificial Intelligence here said they expected those results would become part of I.B.M.'s future software products. The move appears to be part of a major shift within I.B.M., which has traditionally been weak in applications software, programs that perform specific tasks for computer users. Artifical intelligence, a set of programming techniques that generally make computer systems easier to use and capable of performing many jobs without human intervention, are considered essential to that effort. They also use an extraordinary amount of computing power and memory, meaning the prospect of additional hardware sales. ''There is something of an awakening under way at I.B.M.,'' said Raj Reddy, head of Carnegie-Mellon's robotics institute and a leading authority in artificial intelligence. ''Four or five years ago, when you mentioned artificial intelligence, I.B.M. shrugged its shoulders.'' I.B.M. executives here said that within the last year the company had created an artificial-intelligence project office that reports directly to I.B.M.'s management committee, with unusually broad responsibility to integrate new techniques in I.B.M. products. In coming months, the company is expected to bring out its first commercially available expert systems, primarily programs designed for banks, insurance companies and manufacturers. ''Strategically, this is now a very high priority for us,'' said Herbert Schorr, who is directing I.B.M.'s artificial-intelligence initiative. ''It should enable us to attract a new set of users - like loan officers or insurance underwriters - who can retrieve facts off their computers, but get little analysis or instruction about how to apply rules.'' Much of the most promising artificial-intelligence technology is still in university laboratories, notably at Carnegie-Mellon, the Massachusetts Institute of Technology and Stanford University. Thus, companies are forming alliances with those institutions. Under the agreement announced today, I.B.M. will provide Carnegie-Mellon with about $5.5 million in computer equipment and will negotiate contracts for individual studies in artificial intelligence. The equipment is primarily the PC/RT, an engineeering and scientific computer introduced earlier this year. End of Document Ay Robot! Scientists Worry Machines May Outsmart Man The New York Times

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Robot cars drive themselves across the desert, electronic eyes perform lifeguard duty in swimming pools and virtual enemies with humanlike behavior battle video game players. These are some fruits of the research field known as artificial intelligence, where reality is finally catching up to the science-fiction hype. A half-century after the term was coined, both scientists and engineers say they are making rapid progress in simulating the human brain, and their work is finding its way into a new wave of real-world products. The advances can also be seen in the emergence of bold new projects intended to create more ambitious machines that can improve safety and security, entertain and inform, or just handle everyday tasks. At Stanford University, for instance, computer scientists are developing a robot that can use a hammer and a screwdriver to assemble an Ikea bookcase (a project beyond the reach of many humans) as well as tidy up after a party, load a dishwasher or take out the trash. One pioneer in the field is building an electronic butler that could hold a conversation with its master -- a la HAL in the movie ''2001: A Space Odyssey'' -- or order more pet food. Though most of the truly futuristic projects are probably years from the commercial market, scientists say that after a lull, artificial intelligence has rapidly grown far more sophisticated. Today some scientists are beginning to use the term cognitive computing, to distinguish their research from an earlier generation of artificial intelligence work. What sets the new researchers apart is a wealth of new biological data on how the human brain functions. ''There's definitely been a palpable upswing in methods, competence and boldness,'' said Eric Horvitz, a Microsoft researcher who is president-elect of the American Association for Artificial Intelligence. ''At conferences you are hearing the phrase 'human-level A.I.,' and people are saying that without blushing.'' Cognitive computing is still more of a research discipline than an industry that can be measured in revenue or profits. It is pursued in various pockets of academia and the business world. And despite some of the more startling achievements, improvements in the field are measured largely in increments: voice recognition systems with decreasing failure rates, or computerized cameras that can recognize more faces and objects than before. Still, there have been rapid innovations in many areas: voice control systems are now standard features in midpriced automobiles, and advanced artificial reason techniques are now routinely used in inexpensive video games to make the characters' actions more lifelike. A French company, Poseidon Technologies, sells underwater vision systems for swimming pools that function as lifeguard assistants, issuing alerts when people are drowning, and the system has saved lives in Europe. Last October, a robot car designed by a team of Stanford engineers covered 132 miles of desert road without human intervention to capture a $2 million prize offered by the Defense Advanced Research Projects Agency, part of the Pentagon. The feat was particularly striking because 18 months earlier, during the first such competition, the best vehicle got no farther than seven miles, becoming stuck after driving off a mountain road. Now the Pentagon agency has upped the ante: Next year the robots will be back on the road, this time in a simulated traffic setting. It is being called the ''urban challenge.'' At Microsoft, researchers are working on the idea of ''predestination.'' They envision a software program that guesses where you are traveling based on previous trips, and then offers information that might be useful based on where the software thinks you are going. Tellme Networks, a company in Mountain View, Calif., that provides voice recognition services for both customer service and telephone directory applications, is a good indicator of the progress that is being made in relatively constrained situations, like looking up a phone number or transferring a call. Tellme supplies the system that automates directory information for toll-free business listings. When the service was first introduced in 2001, it could correctly answer fewer than 37 percent of phone calls without a human operator's help. As the system has been constantly refined, the figure has now risen to 74 percent. More striking advances are likely to come from new biological models of the brain. Researchers at the Ecole Polytechnique Federale de Lausanne in Lausanne, Switzerland, are building large-scale computer models to study how the brain works; they have used an I.B.M. parallel supercomputer to create the most detailed three-dimensional model to date of a column of 10,000 neurons in the neocortex. ''The goal of my lab in the past 10 to 12 years has been to go inside these little columns and try to figure out how they are built with exquisite detail,'' said Henry Markram, a research scientist who is head of the Blue Brain project. ''You can really now zoom in on single cells and watch the electrical activity emerging.'' Blue Brain researchers say they believe the simulation will provide fundamental insights that can be applied by scientists who are trying to simulate brain functions. Another well-known researcher is Robert Hecht-Nielsen, who is seeking to build an electronic butler called Chancellor that would be able to listen, speak and provide in-home concierge services. He contends that with adequate resources, he could create such a machine within five years. Although some people are skeptical that Mr. Hecht-Nielsen can achieve what he describes, he does have one successful artificial intelligence business under his belt. In 1986, he founded HNC Software, which sold systems to detect credit card fraud using neural network technology designed to mimic biological circuits in the brain. HNC was sold in 2002 to the Fair Isaac Corporation, where Mr. Hecht-Nielsen is a vice president and leads a small research group. Last year he began speaking publicly about his theory of ''confabulation,'' a hypothesis about the way the brain makes decisions. At a recent I.B.M. symposium, Mr. Hecht-Nielsen showed off a model of confabulation, demonstrating how his software program could read two sentences from The Detroit Free Press and create a third sentence that both made sense and was a natural extension of the previous text. For example, the program read: ''He started his goodbyes with a morning audience with Queen Elizabeth II at Buckingham Palace, sharing coffee, tea, cookies and his desire for a golf rematch with her son, Prince Andrew. The visit came after Clinton made the rounds through Ireland and Northern Ireland to offer support for the flagging peace process there.'' The program then generated a sentence that read: ''The two leaders also discussed bilateral cooperation in various fields.'' Artificial intelligence had its origins in 1950, when the mathematician Alan Turing proposed a test to determine whether or not a machine could think or be conscious. The test involved having a person face two teleprinter machines, only one of which had a human behind it. If the human judge could not tell which terminal was controlled by the human, the machine could be said to be intelligent. In the late 1950's a field of study emerged that tried to build systems that replicated human abilities like speech, hearing, manual tasks and reasoning. During the 1960's and 1970's, the original artificial intelligence researchers began designing computer software programs they called ''expert systems,'' which were essentially databases accompanied by a set of logical rules. They were handicapped both by underpowered computers and by the absence of the wealth of data that today's researchers have amassed about the actual structure and function of the biological brain. Those shortcomings led to the failure of a first generation of artificial intelligence companies in the 1980's, which became known as the A.I. Winter. Recently, however, researchers have begun to speak of an A.I. Spring emerging as scientists develop theories on the workings of the human mind. They are being aided by the exponential increase in processing power, which has created computers with millions of times the power of those available to researchers in the 1960's -- at consumer prices. ''There is a new synthesis of four fields, including mathematics, neuroscience, computer science and psychology,'' said Dharmendra S. Modha, an I.B.M. computer scientist. ''The implication of this is amazing. What you are seeing is that cognitive computing is at a cusp where it's knocking on the door of potentially mainstream applications.'' At Stanford, researchers are hoping to make fundamental progress in mobile robotics, building machines that can carry out tasks around the home, like the current generation of robotic floor vacuums, only more advanced. The field has recently been dominated by Japan and South Korea, but the Stanford researchers have sketched out a three-year plan to bring the United States to parity. At the moment, the Stanford team is working on the first steps necessary to make the robot they are building function well in an American household. The team is focusing on systems that will consistently recognize standard doorknobs and is building robot hands to open doors. ''It's time to build an A.I. robot,'' said Andrew Ng, a Stanford computer scientist and a leader of the project, called Stanford Artificial Intelligence Robot, or Stair. ''The dream is to put a robot in every home.'' http : // www.nytimes.com Correction A chart with the continuation of a front-page article on Tuesday about advancements in the research field known as artificial intelligence misstated the year in which a robot at Kawasaki killed a Japanese mechanic because of a malfunction. It was 1981, not 1985. Correction-Date: July 21, 2006 Graphic Photos: Andrew Ng of Stanford University, left, leads a project to create a robot with artificial intelligence. (Photo by Peter DaSilva for The New York Times) (Photographs by Associated Press [HAL], Professor Terry Winograd [blocks], 20th Century Fox [Star Wars], Agence France-Presse [Deep Blue], PRNewsFoto [Volkswagen])(pg. C4)Chart/Photos: ''From Fantasy and Fact''Artificial intelligence has come far since its inception, both in its practical applications and in the popular imagination.1950 -- The mathematician Alan Turing proposes a test for machine intelligence.1956 -- John McCarthy coins the term ''artificial intelligence'' as the topic of the Dartmouth Conference, the first conference devoted to the subject.1959 -- Arthur Samuel's checkers program wins games against the best human players.1962 -- First industrial robot company, Unimation, founded.1967 -- ''HAL'' (above) stars in ''2001: A Space Odyssey.''1969 -- Stanford Research Institute: Shakey the Robot demonstrated combining movement, perception and problem solving.1971 -- Terry Winograd's Ph.D. thesis (M.I.T.) demonstrated the ability of computers to understand English sentences in a restricted world of children's blocks, in a coupling of his language-understanding program with a robot arm that carried out instructions typed in English.1977 -- C3PO and R2D2 star in ''Star Wars.''1981 -- The Fifth Generation Computer Systems project by the Ministry of International Trade and Industry of Japan heralds a generation of intelligent machines.1985 -- A Kawasaki robot kills a Japanese mechanic during a malfunction.1997 -- I.B.M.'s Deep Blue chess program beats the world chess champion Garry Kasparov in a widely followed match.2005 -- Stanley, a robot Volkswagen Touareg, designed by a team of Stanford University engineers, wins the DARPA Grand Challenge award by traveling autonomously for 132 miles through a desert.(pg. C4) Load-Date: July 18, 2006 End of Document Paid Notice: Deaths HERTZ, DAVID BENDEL The New York Times

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''Hi, thanks for coming,'' the medical assistant says, greeting a mother with her 5-year-old son. ''Are you here for your child or yourself?'' The boy, the mother replies. He has diarrhea. ''Oh no, sorry to hear that,'' she says, looking down at the boy. The assistant asks the mother about other symptoms, including fever (''slight'') and abdominal pain (''He hasn't been complaining''). She turns again to the boy. ''Has your tummy been hurting?'' Yes, he replies. After a few more questions, the assistant declares herself ''not that concerned at this point.'' She schedules an appointment with a doctor in a couple of days. The mother leads her son from the room, holding his hand. But he keeps looking back at the assistant, fascinated, as if reluctant to leave. Maybe that is because the assistant is the disembodied likeness of a woman's face on a computer screen -- a no-frills avatar. Her words of sympathy are jerky, flat and mechanical. But she has the right stuff -- the ability to understand speech, recognize pediatric conditions and reason according to simple rules -- to make an initial diagnosis of a childhood ailment and its seriousness. And to win the trust of a little boy. ''Our young children and grandchildren will think it is completely natural to talk to machines that look at them and understand them,'' said Eric Horvitz, a computer scientist at Microsoft's research laboratory who led the medical avatar project, one of several intended to show how people and computers may communicate before long. For decades, computer scientists have been pursuing artificial intelligence -- the use of computers to simulate human thinking. But in recent years, rapid progress has been made in machines that can listen, speak, see, reason and learn, in their way. The prospect, according to scientists and economists, is not only that artificial intelligence will transform the way humans and machines communicate and collaborate, but will also eliminate millions of jobs, create many others and change the nature of work and daily routines. The artificial intelligence technology that has moved furthest into the mainstream is computer understanding of what humans are saying. People increasingly talk to their cellphones to find things, instead of typing. Both Google's and Microsoft's search services now respond to voice commands. More drivers are asking their cars to do things like find directions or play music. The number of American doctors using speech software to record and transcribe accounts of patient visits and treatments has more than tripled in the past three years to 150,000. The progress is striking. A few years ago, supraspinatus (a rotator cuff muscle) got translated as ''fish banana.'' Today, the software transcribes all kinds of medical terminology letter perfect, doctors say. It has more trouble with other words and grammar, requiring wording changes in about one of every four sentences, doctors say. ''It's unbelievably better than it was five years ago,'' said Dr. Michael A. Lee, a pediatrician in Norwood, Mass., who now routinely uses transcription software. ''But it struggles with 'she' and 'he,' for some reason. When I say 'she,' it writes 'he.' The technology is sexist. It likes to write 'he.' '' Meanwhile, translation software being tested by the Defense Advanced Research Projects Agency is fast enough to keep up with some simple conversations. With some troops in Iraq, English is translated to Arabic and Arabic to English. But there is still a long way to go. When a soldier asked a civilian, ''What are you transporting in your truck?'' the Arabic reply was that the truck was ''carrying tomatoes.'' But the English translation became ''pregnant tomatoes.'' The speech software understood ''carrying,'' but not the context. Yet if far from perfect, speech recognition software is good enough to be useful in more ways all the time. Take call centers. Today, voice software enables many calls to be automated entirely. And more advanced systems can understand even a perplexed, rambling customer with a misbehaving product well enough to route the caller to someone trained in that product, saving time and frustration for the customer. They can detect anger in a caller's voice and respond accordingly -- usually by routing the call to a manager. So the outlook is uncertain for many of the estimated four million workers in American call centers or the nation's 100,000 medical transcriptionists, whose jobs were already threatened by outsourcing abroad. ''Basic work that can be automated is in the bull's-eye of both technology and globalization, and the rise of artificial intelligence just magnifies that reality,'' said Erik Brynjolfsson, an economist at the Sloan School of Management at the Massachusetts Institute of Technology. Still, Mr. Brynjolfsson says artificial intelligence will also spur innovation and create opportunities, both for individuals and entrepreneurial companies, just as the Internet has led to new businesses like Google and new forms of communication like blogs and social networking. Smart machines, experts predict, will someday tutor students, assist surgeons and safely drive cars. The Digital Assistant ''Hi, are you looking for Eric?'' asks the receptionist outside the office of Eric Horvitz at Microsoft. This assistant is an avatar, a time manager for office workers. Behind the female face on the screen is an arsenal of computing technology including speech understanding, image recognition and machine learning. The digital assistant taps databases that include the boss's calendar of meetings and appointments going back years, and his work patterns. Its software monitors his phone calls by length, person spoken to, time of day and day of the week. It also tracks his location and computer use by applications used -- e-mail, writing documents, browsing the Web -- for how long and time of day. When a colleague asks when Mr. Horvitz's meeting or phone call may be over, the avatar reviews that data looking for patterns -- for example, how long have calls to this person typically lasted, at similar times of day and days of the week, when Mr. Horvitz was also browsing the Web while talking? ''He should be free in five or six minutes,'' the avatar decides. The avatar has a database of all the boss's colleagues at work and relationships, from research team members to senior management, and it can schedule meetings. Mr. Horvitz has given the avatar rules for the kinds of meetings that are more and less interruptible. A session with a research peer, requiring deep concentration, may be scored as less interruptible than a meeting with a senior executive. ''It's O.K. to interrupt him,'' the assistant tells a visitor. ''Just go in.'' As part of the project, the researchers plan to program the avatar to engage in ''work-related chitchat'' with colleagues who are waiting. The conversation could be about the boss's day: ''Eric's been in back-to-back meetings this afternoon. But he's looking forward to seeing you.'' Or work done with the boss: ''Yes, you were in the big quarterly review with Eric last month.'' Or even a local team: ''How about that Mariners game last night?'' Mr. Horvitz shares a human administrative assistant with other senior scientists. The avatar's face is modeled after her. At Microsoft, workers typically handle their own calendars. So the main benefit of the personal assistant, Mr. Horvitz says, is to manage his time better and coordinate his work with colleagues'. ''I think of it as an extension of me,'' he said. ''The result is a broader, more effective Eric.'' Computers with artificial intelligence can be thought of as the machine equivalent of idiot savants. They can be extremely good at skills that challenge the smartest humans, playing chess like a grandmaster or answering ''Jeopardy!'' questions like a champion. Yet those skills are in narrow domains of knowledge. What is far harder for a computer is common-sense skills like understanding the context of language and social situations when talking -- taking turns in conversation, for example. The scheduling assistant can plumb vast data vaults in a fraction of a second to find a pattern, but a few unfamiliar words leave it baffled. Jokes, irony and sarcasm do not compute. That brittleness can lead to mistakes. In the case of the office assistant, it might be a meeting missed or a scheduling mix-up. But the medical assistant could make more serious mistakes, like an incorrect diagnosis or a seriously ill child sent home. The Microsoft projects are only research initiatives, but they suggest where things are headed. And as speech recognition and other artificial intelligence technologies take on more tasks, there are concerns about the social impact of the technology and too little attention paid to its limitations. Smart machines, some warn, could be used as tools to isolate corporations, government and the affluent from the rest of society. Instead of people listening to restive customers and citizens, they say, it will be machines. ''Robot voices could be the perfect wall to protect institutions that don't want to deal with complaints,'' said Jaron Lanier, a computer scientist and author of ''You Are Not a Gadget'' (Knopf, 2010). Smarter Devices ''I'm looking for a reservation for two people tomorrow night at 8 at a romantic restaurant within walking distance.'' That spoken request seems simple enough, but for a computer to respond intelligently requires a ballet of more than a dozen technologies. A host of companies -- AT&T, Microsoft, Google and startups -- are investing in services that hint at the concept of machines that can act on spoken commands. They go well beyond voice-enabled Internet search. Perhaps the furthest along is Siri, a Silicon Valley company offering a ''virtual personal assistant,'' a collection of software programs that can listen to a request, find information and take action. In this case, Siri, presented as an iPhone application, sends the spoken request for a romantic restaurant as an audio file to computers operated by Nuance Communications, the largest speech-recognition company, which convert it to text. The text is then returned to Siri's computers, which make educated guesses about the meaning. ''It's a bit like the task faced by a waiter for whom English is a second language in a noisy restaurant,'' said Tom Gruber, an artificial intelligence researcher and co-founder of Siri. ''It isn't perfect, but in context the waiter can usually figure out what you want.'' The Siri system taps more data to decide if it is seeking a romantic restaurant or romantic comedy. It knows the location of the phone and has rules for the meaning of phrases like ''within walking distance.'' It scans online restaurant review services like Yelp and Gayot for ''romantic.'' Siri takes the winnowed list of restaurants, contacts the online reservation service Open Table and gets matches for those with tables available at 8 the next day. Those restaurants are then displayed on the user's phone, and the reservation can be completed by tapping a button on the screen. The elaborate digital dance can be completed in a few seconds -- when it works. Apple is so impressed that it bought Siri in April in a private transaction estimated at more than $200 million. Nelson Walters, an MTV television producer in New York, is a Siri fan. It saves him time and impresses his girlfriend. ''I will no longer get lost in searching Yelp for restaurant recommendations,'' he said. But occasionally, Mr. Walters said, Siri stumbles. Recently, he asked Siri for the location of a sushi restaurant he knew. Siri replied with directions to an Asian escort service. ''I swear that's not what I was looking for,'' he said. Mr. Gruber said Siri had heard an unfamiliar Japanese word, but did not know the context and guessed wrong. In cars, too, speech recognition systems have vastly improved. In just three years, the Ford Motor Company, using Nuance software, has increased the number of speech commands its vehicles recognize from 100 words to 10,000 words and phrases. Systems like Ford's Sync are becoming popular options in new cars. They are also seen by some safety specialists as a defense, if imperfect, against the distracting array of small screens for GPS devices, smartphones and the like. Later this summer, a new model of the Ford Edge will recognize complete addresses, including city and state spoken in a single phrase, and respond by offering turn-by-turn directions. To the Customer's Rescue ''Please select one of the following products from our menu,'' the electronics giant Panasonic used to tell callers seeking help with products from power tools to plasma televisions. It was not working. Callers took an average of 2 1/2 minutes merely to wade through the menu, and 40 percent hung up in frustration. ''We were drowning in calls,'' recalled Donald Szczepaniak, vice president of customer service. Panasonic reached out to AT&T Labs in 2005 for help. The AT&T researchers worked with thousands of hours of recorded calls to the Panasonic center, in Chesapeake, Va., to build statistical models of words and phrases that callers used to describe products and problems, and to create a database that is constantly updated. ''It's a baby, and the more data you give it, the smarter it becomes,'' said Mazin Gilbert, a speech technology expert at AT&T Labs. The goal of the system is to identify key words -- among a person's spoken phrases and sentences -- so an automated assistant can intelligently reply. ''How may I help you?'' asked the automated female voice in one recording. ''I was watching 'American Idol' with my dog on Channel 5,'' a distraught woman on the line said recently, ''and suddenly my TV was stuck in Spanish.'' ''What kind of TV?'' the automated assistant asked, suggesting choices that include plasma, LCD and others. ''LCD,'' replied the woman, and her call was sent to an agent trained in solving problems with LCD models. Simple problems -- like product registration or where to take a product for repairs -- can be resolved in the automated system alone. That technology has improved, but callers have also become more comfortable speaking to the system. A surprising number sign off by saying, ''Thank you.'' Some callers, especially younger ones, also make things easier for the computer by uttering a key phrase like ''plasma help,'' Mr. Szczepaniak said. ''I call it the Google-ization of the customer,'' he said. Over all, half of the calls to Panasonic are handled in the automated system, up from 10 percent five years ago, estimated Lorraine Robbins, a manager. But the other half of calls are more complex problems -- like connecting a digital television to a cable box. In those cases, the speech recognition system quickly routes a call to an agent trained on the product, so far more problems are resolved with a single call. Today, Panasonic resolves one million more customer problems a year with 1.6 million fewer total calls than five years ago. The cost of resolving a customer issue has declined by 50 percent. The speech technology's automated problem sorting has enabled Panasonic to globalize its customer service, with inquiries about older and simpler products routed to its call centers in the Philippines and Jamaica. The Virginia center now focuses on high-end Panasonic products like plasma TVs and home theater equipment. And while the center's head count at 200 is the same as five years ago, the workers are more skilled these days. Those who have stayed have often been retrained. Antoine Andujar, a call center agent for more than five years, attended electronics courses taught at the call center by instructors from a local community college. He used to handle many products, but now specializes in issues with plasma and LCD televisions. Mr. Andujar completed his electronics certification program last year, and continues to study. ''You have to move up in skills,'' he said. ''At this point, you have to be certified in electronics to get in the door here as a Panasonic employee.'' The Efficient Listener ''This call may be recorded for quality assurance purposes.'' But at a growing number of consumer call centers, technical support desks and company hot lines, the listener is a computer. One that can recognize not only words but also emotions -- and listen for trends in customer complaints. In the telephone industry, for example, companies use speech recognition software to provide an early warning about changes in a competitor's calling plans. By detecting the frequent use of names like AT&T and other carriers, the software can alert the company to a rival that lowered prices, for example, far faster than would hundreds of customer service agents. The companies then have their customer agents make counteroffers to callers thinking of canceling service. Similar software, used by a customer of Verint Systems, began to notice the phrase ''cash for clunkers'' in hundreds of calls to its call center one weekend last year. It turned out that tens of thousands of car shoppers responding to the government incentive were calling for insurance quotes. Aetna created insurance offers for those particular callers and added workers to handle the volume. And as Apple's new smartphone surged in popularity several years ago, GoDaddy, an Internet services company, learned from its call-monitoring software that callers did not know how to use GoDaddy on their iPhones. The company rushed to retrain its agents to respond to the calls and pushed out an application allowing its users to control its service directly from the iPhone. Certain emotions are now routinely detected at many call centers, by recognizing specific words or phrases, or by detecting other attributes in conversations. Voicesense, an Israeli developer of speech analysis software, has algorithms that measure a dozen indicators, including breathing, conversation pace and tone, to warn agents and supervisors that callers have become upset or volatile. The real issue with artificial intelligence, as with any technology, is how it will be used. Automation is a remarkable tool of efficiency and convenience. Using an A.T.M. to make cash deposits and withdrawals beats standing in line to wait for a teller. If an automated voice system in a call center can answer a question, the machine is a better solution than lingering on hold for a customer service agent. Indeed, the increasing usefulness of artificial intelligence -- answering questions, completing simple tasks and assisting professionals -- means the technology will spread, despite the risks. It will be up to people to guide how it is used. ''It's not human intelligence, but it's getting to be very good machine intelligence,'' said Andries van Dam, a professor of computer science at Brown University. ''There are going to be all sorts of errors and problems, and you need human checks and balances, but having artificial intelligence is way better than not having it.'' Smarter Than You Think: Articles in this series will examine the recent advances in artificial intelligence and robotics and their potential impact on society. http : // www.nytimes.com Correction This article has been revised to reflect the following correction: An article on June 25 about progress in speech recognition technology misidentified the company that used the technology to identify increased use of the phrase ''cash for clunkers.'' The company was a customer of Verint, which supplies speech analysis software to call centers; it was not Aetna Insurance. (Verint would not identify the customer.) Correction-Date: July 2, 2010, Friday Graphic PHOTOS: Eric Horvitz's receptionist at Microsoft is a computer that can interact with visitors outside his office in Redmond, Wash. (PHOTOGRAPH BY STUART ISETT FOR THE NEW YORK TIMES) (A1) The patients' view The system's view (PHOTOGRAPHS BY MICROSOFT RESEARCH) Dr. Michael Lee with Chantelia Garrity and her daughter this month in Norwood, Mass. Dr. Lee uses speech software to transcribe his recorded notes. (PHOTOGRAPH BY JODI HILTON FOR THE NEW YORK TIMES) (A20) GRAPHICS: A Doctor's Office, Revisited: Researchers at Microsoft are developing technology that would allow more than one person to have a conversation with a computer in a variety of settings. Below, a demonstration of how a medical office might be staffed by a machine. The example was designed to illustrate how parts of the technology work together and how people take on different roles in a conversation. The Digital Brain at Work (Source: Eric Horvitz and Dan Bohus, Microsoft Research) (A20) Load-Date: July 2, 2010 End of Document Microsoft Introduces Tool For Avoiding Traffic Jams The New York Times

Time: 10/04/2008  
fledgling science that creates software whose behavior mimics that of living creatures is beginning to provide scientists with a new class of software tools with significant commercial potential. The science is known as artificial life. Its practitioners have produced computer programs that can actually evolve into more powerful programs through their own interaction and merging to create a new generation - a Darwinian process similar to that of biological organisms. Through the computerized equivalent of the survival of the fittest, a computer runs thousands of programs simultaneously and a specially tailored master program selects those that most efficiently accomplish a given task. The programs that do well are then combined to produce a next generation that is even better in accomplishing the task. Such evolution could produce software more reliable than that designed by human programmers, who cannot anticipate all the potential ways in which their software can fail. 'Like Playing God' ''The dream is to 'evolve' programs that do things that we want,'' said Danny Hillis, a computer scientist who is co-founder of Thinking Machines Inc., a Cambridge, Mass., maker of a parallel supercomputer. ''Ultimately, it will be like playing God,'' he said of the possibility of creating a computerized universe for software evolution in order to breed useful programs. ''It's not quite useful yet, but there's reason to believe that it's just about to be.'' As one example of such technology, Thinking Machines has created, in only its first attempt with artificial life techniques, a program for sorting a list of numbers that comes close to the most efficient human-crafted program for that purpose. Artificial life techniques are also being used to simulate the behavior and evolution of genes and of the organisms they make up. Instead of programming each step the software should take, the artificial life approach creates basic rules, allowing small, interacting software modules to exhibit the kind of complex and unexpected behavior that organisms do. In this way, scientists at the University of California at Los Angeles have developed a program that mimics the behavior of mosquitoes to determine growth rates and therefore precisely where and how much insecticide must be applied. Other software products are being designed based on the behavior of groups of organisms, particularly the tendency of their interactions to produce complex behavior. For example, Borland International, a Scotts Valley, Calif., software publisher has recently redesigned three of its most popular programs to allow the interactions of small software modules to control the programs. Studying Basic Behavior The science of artificial life resembles that of artificial intelligence, a commercial and scientific discipline that first flourished in the 1960's, in its attempt to mimic or simulate natural processes. But where artificial intelligence focuses on simulating human qualities like vision and speech, work on artificial life is taking on a much broader challenge: the basic behavior of all organisms. Artificial intelligence research has already spawned robots, vision- and voice-recognition systems, and ''expert systems'' of software that apply the knowledge of human experts. But that field has in some ways been disappointing. Many problems have proved much more challenging than originally thought. ''There is a lot of frustration in the lack of progress in artificial intelligence during the last 40 years,'' said J. Doyne Farmer, an artificial life researcher at the Santa Fe Institute, which studies complex organizations and biological and physical processes. ''They missed something along the way. We'd like to go back to fundamentals.'' Hunting for Improvement Mr. Hillis at Thinking Machines has developed a striking example of the potential power of artificial life research. His company's computer, known as a Connection Machine, is based on as many as 64,000 individual processors that can simultaneously test different programs for sorting lists of numbers, combine them with other programs and evolve thousands of generations of programs in a relatively short time. Mr. Hillis has added to his simulation some software with a role equivalent to a biological parasite's. It wipes out any program that is so competent that it comes to dominate the system. This forces a search for new programs that are even better. Mr. Hillis said his approach to software design could offer an avenue for more rugged testing of advanced programs that are so complex that their designers cannot fully comprehend all of their functions. He also says that artificial life methods suggest a novel solution to the problem of computer security. An operating system - a computer's basic control program - could be evolved in a manner similar to the way he derived his sorting program. Such an approach would insure diversity and limit the spread of computer viruses that now prey on extremely homogeneous computer environments. Creating more powerful software through evolution rather than by designing it ''is a radical approach to programming,'' said Esther Dyson, a computer industry analyst and publisher of Release 1.0. ''Just as you now find artificial intelligence techniques infiltrating regular programming, in the future you will find artificial life techniques infiltrating the design of operating systems and computer networks.'' Already in Practical Use Artificial life techniques are already being translated into practical use. At UCLA, a biologist, Charles Taylor, and a computer scientist, David Jefferson, have developed a simulation program that runs on a Connection Machine to assist mosquito abatement programs in Orange County and Alameda County in California. County officials are using the program to help them apply insecticides more efficiently. ''By the use of our software Alameda County has reduced the number of treatment sites to 3,000 from 20,000,'' Dr. Taylor said. Minimizing the levels of insecticide applied is crucial because mosquitoes quickly build immunity, he said. Moreover, techniques being explored by artificial life researchers are already starting to find their way into commercial software. For example, Borland has redesigned three of its most popular programs so that they are composed of tiny modular ''capsules'' of software instructions. Borland's Reflex and Paradox, data base management programs, and Quattro, a spreadsheet, use the new technology to run more quickly within the limited confines of the memory available on an I.B.M. Personal Computer. A set of rules governing priority moves the small capsules from the disk to the computer's memory as they are needed and then discards them as space is needed for data. The advantage of the system is that it permits the program to run faster in a limited amount of memory available to it. Graphic Table showing how to make better software by using evolution. End of Document Young Math Wizard Stumbles Upon Oz, Deep in the Heart of the Internet; Movie Review | 'Summer Wars' The New York Times

Time: 09/08/2012  
Canadian inventor has developed a robot that can vacuum office buildings and industrial areas without assistance. Vivek P. Burhanpurkar, a 26-year-old electrical engineering student in Orillia, Ontario, said he has employed ''a new kind of artificial intelligence that allows the robot to perform the way a human would, at least in terms of vacuuming.'' The robot is different from others in that it does not follow a preprogrammed track and does not bounce off objects. The machine, which simply has to be switched on to do its work, emits ultrasonic waves that enable it to calculate, among other things, the distance between it and other objects. The machine, which is not yet commercially available, has been used in tests by Hoden B. V., an Amsterdam-based company that operates Europe's largest contract cleaning business. Hoden and the National Research Council of Canada helped finance the $2 million in research and development costs. For now, the machine is not ideal for home use. For one thing, it is 3 feet high, 2 feet long and 2 feet wide - too big to clean under tables or in narrow spaces. Also, the current price for the machine is $10,500. But, Mr. Burhanpurkar predicted that the technology would eventually become more widely used. ''This artificial intelligence technology can be used to create a security guard robot that could sense sound, movement, radiation or gas leaks,'' he said. Mr. Burhanpurkar's company, Cybervac, has a tentative order for 300 machines from Hoden and inquiries from other companies in Europe and North America. ''We're quite pleased with its performance so far,'' said Cees Ravesteyn, Hoden's general counsel, adding that the Cybervac machine will ultimately cut in half the time the company's 40,000 workers spend vacuuming. He said that using 300 of the robot vacuums would mean a reduction of about 1 percent of the company's operating costs. Graphic drawing End of Document Tech's New Wave, Driven By Data The New York Times

Time: 11/05/2009  
Every new online search service must face the inevitable question: ''Is it better than Google?'' WolframAlpha, a powerful new service that can answer a broad range of queries, has become one of the most anticipated Web products of the year. But its creator, Stephen Wolfram, wants to make something clear: Despite the online chatter comparing it to Google, his service is not intended to dethrone the king of search engines. ''I am not keen on the hype,'' said Mr. Wolfram, a well-known scientist and entrepreneur and the founder of Wolfram Research, a company in Champaign, Ill., that has been quietly developing WolframAlpha. Mr. Wolfram's service does not search through Web pages, and it will not help with movie times or camera shopping. Instead it computes the answers to queries using enormous collections of data the company has amassed. It can quickly spit out facts like the average body mass index of a 40-year-old male, whether the Eiffel Tower is taller than Seattle's Space Needle, and whether it is high tide in Miami right now. WolframAlpha, which is expected to be available to the public at wolframalpha.com in the next week, is not a finished product. It is an early working version of a project that has been years in the making and will continue to evolve over years, if not decades. As such, there is much it cannot answer now. But even as he dismisses the Google comparisons, Mr. Wolfram, a former child prodigy who published his first research paper on particle physics at age 15 and is best known for creating the math-formula software Mathematica, is happy to add fuel to the simmering expectations surrounding his service. ''I think WolframAlpha has the potential to be quite important,'' he said. The goal of creating a computer system that can answer questions has been a tantalizing but elusive pursuit for many computer scientists for more than four decades. Some veterans of the field say Mr. Wolfram may have come as close as anyone yet. ''In many ways, creating a system like this has been a holy grail of lots of folks for some time,'' said Nathan Myhrvold, a former chief technology officer of Microsoft and co-founder of Intellectual Ventures, an investment company that owns a portfolio of patents. ''It has wound up being considered something that is virtually impossible,'' Mr. Myhrvold said. WolframAlpha has shown ''that it wasn't impossible but really difficult,'' he added. ''It involved applying lots of different tricks.'' Doug Lenat, an artificial intelligence expert whose company Cycorp has spent the last 15 years developing a system that brings human-like reasoning to some computer systems, said WolframAlpha can handle ''an astronomical number of questions,'' and could eventually turn into a favorite destination on the Web. ''It may become a massive player alongside Google,'' Mr. Lenat said. Traditional search engines like Google and Yahoo, by and large, excel at finding information that already exists online. If there are Web pages that include the words used in a query, the engines will find them and rank them in order of relevance. WolframAlpha is different. For starters, it does not gather data from the Web. Instead, its ''knowledge base'' is made up of reams and reams of data -- ranging from the kinds of facts you would find in a World Almanac, to highly specialized data from physics and other sciences -- that some 100 employees at Wolfram Research have gathered, verified and organized over several years. When a user types in a query, WolframAlpha tries to determine the relevant area of knowledge and find the answers, often by performing calculations on its data. If you type ''LDL 120,'' it will return a graph showing the distribution of cholesterol levels among the United States population, and display the percentage of people above and below that figure. If you type ''LDL 120 male 33,'' it will adjust the results to focus on that gender and age group. In response to ''how far is the Moon from Earth,'' WolframAlpha will calculate the exact distance based on an algorithm that computes the ever-changing distance between the two bodies. The engine that computes answers is largely built on Mathematica. In its current state, there are many queries that WolframAlpha cannot answer, either because it does not understand the question or because it does not have the requisite data. For instance, it is stumped by queries like ''obesity rate,'' ''housing prices New York'' or ''unemployment San Francisco'' (but it will answer ''unemployment San Francisco County''). ''It is going to be very good in some areas and incomplete in others,'' said Nova Spivack, the chief executive of Radar Networks, which is using artificial intelligence and other techniques to help people find Web content that is interesting and relevant to them. WolframAlpha does not actually try to work out the real meaning of a query, as some artificial intelligence systems do, so there are some questions it will never be able to answer. But experts say its approach appears to be effective in many areas. ''He's done a great job of marrying the acquisition of data with the mathematical algorithms,'' said David A. Ferrucci, an artificial intelligence researcher at I.B.M., who is leading a team developing a computer program that will compete with humans on ''Jeopardy.'' If successful, WolframAlpha has the potential to become a large business opportunity. For now, Mr. Wolfram said he plans to offer advertising and other forms of sponsorship on the site, and perhaps offer premium versions of the service for researchers. And somewhat coyly, he said he has discussed potential partnerships with the ''obvious people,'' including search engine companies. ''We are actively pursuing interesting relationships,'' he said. Representatives for Google and Yahoo declined to discuss WolframAlpha. Mr. Spivack and others said WolframAlpha may become a complement to traditional search engines, which themselves have begun to offer simple versions of the kinds of calculations and data manipulation at which WolframAlpha excels. ''There is a huge space of possible questions that Google doesn't answer,'' Mr. Spivack said. ''I think WolframAlpha will go well beyond the academic world to cover business and industry, economics, health.'' http : // www.nytimes.com Graphic PHOTOS: Stephen Wolfram, some computer science veterans say, may have come closer to creating a question-answering computer system with his WolframAlpha service. (PHOTOGRAPH BY RICK FRIEDMAN FOR THE NEW YORK TIMES) Load-Date: May 11, 2009 End of Document Guided by Computers and Sensors, a Smooth Ride at 60 Miles Per Hour The New York Times

Time: 10/10/2010  
Calif. -- As we merged with freeway traffic on Highway 101, one of Silicon Valley's busiest freeways, Christopher Urmson, the man in the driver's seat, gestured, not touching the steering wheel. Mr. Urmson is a Google engineer, and last Wednesday, I sat belted in the back seat as he talked and as the car, a Toyota Prius equipped by Google with radar, video, motion sensors and a GPS device, drove itself at 60 miles an hour. My eyes were glued to the 22-inch three-dimensional color display in front of Dmitri Dolgov, an artificial intelligence researcher at Google who was riding shotgun. It showed the world around us in great detail, down to painted lane markers, stop signs, traffic lights and a sliding green column that indicated our path. A blocky yellow object representing a car was coming up behind us in the lane we were entering as the robotic, female voice of the Prius announced, ''Preparing to change lane.'' ''Don't worry, we have plenty of room,'' Dr. Urmson said. We followed a 12-mile planned route in a vehicle that looks different from the striking Google Street View cars, which are distinguished by a six-and-a-half-foot-tall camera mast. Instead, Google's autonomous Prius has a more modest if no less striking sensor mounted in the center of the vehicle's roof. Known as Lidar, or Light Detection and Ranging, it provides a continuously updated three-dimensional map of the world at centimeter accuracy extending for more than 230 feet around the car. The Lidar is supplemented by four standard automotive radars with less resolution and greater range, three in front and one in the rear. Inside the car, positioned next to the rear-view mirror, is a high-resolution video camera to detect street lights and moving obstacles like pedestrians and bicyclists. The Prius also has a GPS receiver and an inertial motion sensor. The same, or very similar, sensor array was used on many of the cars that competed in the 2007 Defense Advanced Research Projects Agency Urban Challenge, a competition for autonomous automobiles held on the grounds of a former Air Force base. What has changed -- in addition to the use of public roads -- is the computing power available to the designers and the artificial intelligence software. Designers have made advances in detecting pedestrians, street lights and lane markers, as well as in resolving conflicting sensor data and in motion planning to avoid obstacles. A traffic-cop program monitors all the car's processes. One main technique used by the Google team is known as SLAM, or simultaneous localization and mapping, which builds and updates a map of a vehicle's surroundings while keeping the vehicle located within the map. To make a SLAM map, the car is first driven manually along a route while its sensors capture location, feature and obstacle data. Then a group of software engineers annotates the maps, making certain that road signs, crosswalks, street lights and unusual features are all embedded. The cars then drive autonomously over the mapped routes, recording changes as they occur and updating the map. The researchers said they were surprised to find how frequently the roads their robots drove on had changed. Unsolved problems remain. Sebastian Thrun, a Google engineer and head of the Stanford Artificial Intelligence Laboratory, said the design team was stumped by how to train its system to follow the hand signals that a human traffic cop or crossing guard might make. Despite its limitations -- and they are significant -- the Google car's abilities occasionally gave me goose bumps, particularly compared with previous rides in autonomous vehicles. In 2005, I was in such a vehicle with Dr. Thrun and two others when it swerved off a gravel road at more than 20 miles per hour. Unlike the newer Google cars, the only way to wrest control from that car was to hit a large red button on the driver's console, and Dr. Thrun was simply unable to push the button quickly enough to keep the car from driving into the brush. For me, the tour de force of the new car came when the vehicle halted at a stop sign to make a right turn. It waited patiently for a vehicle in front of it to turn, then inched forward. A car was approaching from the left, but the Prius pulled into the far right lane, and I realized that it ''knew'' the other car was not in our lane even though it was passing close to us. There was no need to hit the red button. http : // www.nytimes.com Graphic PHOTO: A car driven by computer hardware recently attracted the attention of a bicyclist in Mountain View, Calif. (PHOTOGRAPH BY RAMIN RAHIMIAN FOR THE NEW YORK TIMES) Load-Date: October 10, 2010 End of Document Google's Lab of Wildest Dreams - Correction Appended The New York Times

Time: 13/03/2008  
y STEVEN J. MARCUS David I. Smith has worked for the General Electric Company for more than 40 years. Employed at the Transportation Systems division in Erie, Pa., he is an expert on the diagnosis and repair of locomotives and is considered one of the company's top field-service engineers. But Mr. Smith's expertise is a scarce resource. His help is often needed in many different places at once, and he is in great demand, far in excess of his availability, for training young engineers across the country. When Mr. Smith retires, moreover, his knowledge would normally leave the company with him. comment on serious attempts to apply tools of computer science to formalizing and roughly reproducing certain kinds of human thought processes; case of David I Smith, one of General Electric Company's top field-service engineers, cited; Smith is expert on diagnosis and repair of locomotives, and his expertise is scarce resource; when Smith retires, his knowledge would normally leave company with him; GE has developed a computer-aided trouble-shooting system, or CATS-1, that carries much of Smith's knowledge and emulates what he would do on job; system was made public for first time last week in Washington at annual meeting of American Assn for Artificial Intelligence; photo of Smith at work (M) In this case, G.E. is trying to immortalize Mr. Smith. The company has developed a computer-aided trouble-shooting system, or CATS-1, that carries much of his knowledge and emulates what he would do on the job. This system, made public for the first time last week in Washington, at the annual meeting of the American Association for Artificial Intelligence, is by no means alone among serious attempts to apply the tools of computer science to formalizing and roughly reproducing certain kinds of human thought processes. Forerunners include Dendral, a system developed at Stanford University to help chemists identify unknown organic compounds; Mycin, Stanford's system to aid physicians in selecting antibiotics for patients with severe infections, and Prospector, a system developed by SRI International to help geologists evaluate sites for mineral deposits. But CATS-1 is a significant advance in the ''industrialization of artificial intelligence,'' says Francis S. Lynch, manager of the Knowledge-Based Systems group that developed it at G.E.'s Research and Development Center, because it is one of the first that is designed for routine operation on the shop floor. It may well inspire similar systems, he says, for a wide variety of products and processes, some of which the company is already investigating. Developing Rules of Thumb An expert system has two basic elements: the ''knowledge base'' gleaned from the expert and the ''inference engine,'' the logical structure within which the computer applies that knowledge in response to available evidence to draw conclusions and recommend actions. A major difficulty in building expert systems is that human experts are not usually aware of the exact mental processes by which they diagnose a problem; they apply their knowledge in subtle, seemingly instinctive, ways that elude codification. An effort is thus necessary to determine usable ''heuristics,'' or rules of thumb, that can be embedded into precise logical sequences that a computer can execute. For Mr. Smith, the design process, was a labor of love.continuous. ''I brought the system home to go through its nooks and crannies,'' he says, ''and soon lost all track of time. It's very exciting, and I had a ball.'' The CATS-1 system now has 550 rules to cover about 50 percent of the problems that locomotive repair shops may encounter, says Mr. Lynch, and is expected to have about 1,500 rules within a year, enabling it to diagnose 80 percent of locomotive repair problems. The system is also unique, he says, in its portability. It is the first to be programmed on a microcomputer for industrial use. Other Systems Being Developed John H. Clippinger, president of the Brattle Research Corporation, a consulting concern specializing in artificial intelligence, says G.E. is ''one of the first to intelligently and practically exploit the technology,'' but it will not be the last. Bell Laboratories has been developing a comparable system, called Automatic Cable Expertise, to encode the know-how of experienced telephone cable-maintenance experts. And I.B.M., Fairchild, Digital, Texas Instruments, Xerox and Schlumberger have also been developing expert systems. Not all are limited to repair. Digital built a system to configure components of the company's VAX-11 line of computers for the specific requirements of each customer, and it has been successful enough - the company estimates savings in millions of dollars a year - to have inspired the development of expert systems for other company product lines. New Industry Developing Until recently, most of the systems were developed by in-house groups within organizations devoted to other pursuits. But artificial-intelligence companies are now forming expressly to design and install expert systems for corporate clients. They include Syntelligence, Smart Systems, Intelligenetics, Cognitive Systems and APEX (for Applied Expert Systems). The ''granddaddy,'' only two years old, is Teknowledge. Formed in Palo Alto by 20 computer scientists from Stanford University, Carnegie-Mellon University and the Massachusetts Institute of Technology, it has developed 10 expert systems currently in operation. ''Drilling Advisor,'' for example, was developed for Elf-Aquitaine to diagnose the causes of sticking problems on oil rigs. Such a system can save clients a great deal of money, says John Vermes, director of knowledge-systems marketing for Teknowledge, but it costs them a great deal as well. He estimates that a basic core system can cost from $200,000 to $500,000, exclusive of the value of time spent interviewing the expert and training personnel. ''When all is said and done,'' he says, ''the cost of the first stage is about $1 million.'' And integrating the system with the client's data sources, he says, can make the price tag virtually ''open-ended,'' doubling or even tripling the cost. Job Elimination Feared In expert systems, as in robotics and computer applications in general, a common fear is that people will be replaced. Once Mr. Smith retires from G.E., for example, he will still be available in the form of CATS- 1. Therefore why expect someone else to grow into his position? G.E. officials say that its expert system simply assists in training - it is an ''explanation system,'' they say, not a magic black box - and just as students can eventually surpass their human teachers, trouble-shooters so trained may grow beyond the programmed approximation of one expert's knowledge. The G.E. expert, Mr. Smith, concedes that the original intent of the system was for any repair shop to plug it in and have an in-house expert like himself. But it evolved from a prompting aid to a teaching tool as field trials progressed, he says. ''You could take a kid from the Pizza Hut and teach him how to approach maintenance problems,'' says Mr. Smith, ''and you could also retrain an experienced person in a subtle and polite way.'' Company officials contend, moreover, that the system will be attractive to professionals because it allows them to concentrate on more interesting tasks. ''It frees the expert from diddly problems,'' says Mr. Lynch, ''and enables him to choose the work he likes best.'' Graphic photo of David Smith End of Document Viewing Robots as Assistants, Not Replacements The New York Times

Time: 18/10/2010  
used to be that to use a computer a person had to speak the computer's language. Slowly, however, computers are learning to speak people's language. In laboratories around the nation, scientists are grappling with making computers understand English so that people can communicate ''naturally'' with them. Development of such natural language systems is part of an effort to make computers easier to use. At the National Computer Conference in Chicago last week, the feature attraction was the Star work station, a computer terminal developed by the Xerox Corporation, which allows its user to point at little pictures on the screen rather than to type commands. Other vendors demonstrated terminals that could recognize voice commands. These developments are expected to help computers become more widely used by businessmen and eventually by consumers who have had no formal computer training. Technology column discusses how scientists are developing natural English language systems for computers ''Look at all the people in the world who know English and then count all the people who know Fortran and Basic,'' said Larry R. Harris, vice president of the Artificial Intelligence Corporation, the first company to market a natural language system. Like many in the field, the company's product, called Intellect, falls far short of allowing a computer to converse freely with its user. It allows the user to retrieve stored information by typing questions in English Say, for instance, a company kept records on its sales force in the computer. Using Intellect, a personnel manager might ask, ''Who are our salesmen in Illinois who make between $20,000 and $30,000 a year?'' The computer would print the answer. The manager then might follow with, ''What were their May sales figures?'' Previously, retrieving such information would require writing a program or using English queries but in a rigid format. The Intellect program also attempts to spot ambiguities and tell the user when it does not understand a word. Asked for a salesman in New York, the computer might ask whether the user meant New York City or New York State. Such natural language systems grew out of efforts in the 1950's and 1960's to use computers to translate documents rapidly from one language to another. Scientists quickly discovered that translating word for word produced nearly meaningless results, so attempts were directed at ways to analyze sentence structure. Today's natural language systems use stored dictionaries of words and rules to analyze, or parse, a sentence, much as students in junior high school are taught to diagram sentences. After the various parts of the sentence are analyzed, the computer in effect writes a little program to retrieve the desired information from the data base. For all their seeming promise, however, natural language systems have been far from successful in the marketplace. Artificial Intelligence, which is based in Waltham, Mass., has been the only vendor in the marketplace for several years, yet has attracted only about a dozen customers. Other research in the field has taken place since the early 1970's in such universities as the California Institute of Technology and the University of Illinois, but there has been little effort to bring the research to market. Computer companies have also been less than enthusiastic. The International Business Machines Corporation installed a natural language query system in the planning department of the city of White Plains, in 1978 and 1979. Planners were able to retrieve information about zoning and property ownership and values. Yet when the test was over, I.B.M. took the work back into the laboratory, and it has never again emerged. Natural language query systems suffer from several shortcomings. They generally have trouble with certain parts of speech, particularly conjunctions and pronouns. ''Everyone knows that pronouns are terrible beasts,'' said Bozena Henisz Thompson, a research associate in linguistics at the California Institute of Technology. Even more significant, according to David Waltz, professor of electrical engineering at the University of Illinois, is that computers lack the common sense to understand what the user really wants. A computer that is asked, ''Can you tell me the names of our salesmen?'' is likely to answer ''yes'' rather than to list the names. In addition, many computerized data bases are not designed to have information retrieved by natural language questioning. Most of the systems developed in laboratories are geared to operate on one specific data base. Moving a system like Intellect into a new company can take months, although Dr. Harris said Artificial Intelligence was drastically reducing that time. The expense of the system - Intellect starts at $47,000 - can also be a barrier. Finally, there is a question about how big the market for natural language systems will become. The person who would most benefit from such a system, a manager or professional in a company, might not like to type. Others, who use the terminal frequently, might prefer to learn a few codes rather than having to type out an entire question. Some, like Professor Waltz, suggest that the real market for natural language systems will only arrive when computers can recognize voice commands. Computers can now recognize individual words or phrases but not continuous speech. Nevertheless, Artificial Intelligence says its product is finally ready to make big inroads into the market, and others are following. Hewlett-Packard is supporting the work of Bozena Thompson and her husband and partner, Frederick B. Thompson, at Cal Tech, and Texas Instruments has begun a research program into natural language queries. ''When it comes, it's going to explode,'' said Mr. Thompson, who predicts that will occur in two to five years. One hopeful sign that natural language is arriving is that it has been incorporated into an electronic game, which is often a proving ground for many electronic advances. In ZORK, a game developed by M.I.T. researchers, a computer user directs the computer to take him on an imaginary adventure using English commands. The computer responds, telling the user the outcome of his action. Graphic Illustrations: drawing End of Document A Robot at My Side, to Help and Advise? The New York Times

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new car that has six wheels and television cameras, propels itself and needs no driver is in the forefront of what scientists at Carnegie-Mellon University in Pittsburgh call a new generation of robots. The vehicle, called the Terregator, follows the first crude robots of the 1960's and the far more sophisticated generation now widely used to perform automated tasks in factories. The new machines blend recent advances in artificial intelligence, computer science and microelectronics. They would have the ability not only to collect information, as does the Terregator in sensing the environment around it, but to make independent judgments, as the car must do to adjust speeds and steer around obstacles. Carnegie-Mellon University scientists develop Terregator, vehicle that has six wheels and television cameras, propels itself and needs no driver; model uses lasers, acoustic devices and stereo television to scan terrain and match it with images in its computer; Dr William Whittaker comments (S)Sensors and a Computer The Terregator uses a combination of lasers, acoustic devices that use sound to judge distances like a bat, and stereo television with multiple cameras to scan the terrain ahead. It then tries to match the terrain with similar images in its computer. Thus, in theory, the straight lines, undulations, curves, curbs and edges that are normal features of roads can be seen, and instructions for steering and speed adjustments can be made when needed. If the sensors confront extremely complicated patterns, the Terregator can communicate by radio with a nearby mainframe computer that is programmed with a wider variety of visual scenarios. One organization with particular interest in such sophisticated systems is the Pentagon, which last summer began a $600 million Strategic Computing Program, a 10-year effort aimed at developing third-generation robots, some within five years. Labeled ''machine intelligence technology'' by the Army, research on this new breed of robots directly affects the development of such military hardware as cruise missiles, tanks and underwater drones. Gas or Electric Power Different versions of the six-wheeled Terregator, which looks like a small, squat van and weighs from 1,000 to 2,000 pounds depending upon the type of equipment carried, are powered by either gasoline or electricity. ''We're not saying the vehicle is perfect yet,'' said Dr. William Whittaker, an engineering professor at Carnegie-Mellon's Robotics Institutes who is the principal scientist on the project. He said that the Terregator's performance severely embarrassed its creators recently when they took it out for a spin in neighboring Schenley Park. ''We aimed it down a wooded path and it was going quite well until the curves became sharper and it got into trouble, veering off the track, climbing a tree to the height of four feet, and clawing at the bark,'' Dr. Whittaker said. ''We eventually figured out that its model of a road better fit the tree than the path did,'' he said. ''We're working to correct that.'' Uses of Unmanned Vehicles Dr. Whittaker spoke enthusiastically about the possible uses of vehicles like the Terregator. ''Why shouldn't we send machines rather than people into hazardous places such as radioactive factories,'' he asked, ''and why not have autonomous vehicles doing the mindless drudgery of planting and harvesting crops, and why not have the ore stripped from an open pit copper mine carried by a Terregator rather than a dump truck run by a totally unnecessary man.'' ''True, the target is blue sky,'' Dr. Whittaker continued, ''but the idea of pilotless navigation will be of great practical interest at some time because the ability of a robot to locomote has value that far exceeds operations from a fixed base.'' ''Much of the heavy works of the world require mobility and locomotion-mining, materials handling, undersea pipe laying, and some may be hazardous because they may occur in the presence of extreme heat, dust and radiation,'' he said. ''That's why pilotless navigation makes sense, and why it might be necessary for a mobile robot to have its own wits.'' A Dozen Research Projects Research and development projects similar to Carnegie-Mellon's are under way at a dozen other facilities around the nation, including the Artificial Intelligence Laboratory of the Massachusetts Institute of Technology, and the Martin Marietta Corporation in Denver. Walter Cooper, a spokesman for Martin Marietta, said the project there, which is financed through a $17 million grant from the Pentagon's Defense Advanced Research Projects Agency, is intended both to demonstrate that such a vehicle can function and to test advanced technologies. The craft being developed in Denver, called the Autonomous Land Vehicle, has eight wheels and is the brainchild of the Army Engineer Topographic Laboratories of Fort Belvoir, Va. As defined in its five-year Pentagon contract, Martin Marietta is ''to develop and integrate systems for an autonomous, land-roving, robot vehicle that will be used as a national test bed for industry and university developments in artificial intelligence and advanced computer architectures.'' One of the ideas being considered by the Army is called the ''mother and ducklings'' scenario, in which a squadron of robot tanks on a battlefield would be led by one manned tank. The robot tanks would take cues from the master tank, but once engaged in battle could operate on their own. ''Autonomous land vehicle systems could support such missions as deep-penetration of reconnaissance, rear area resupply, ammunition handling and weapons delivery,'' according to a Pentagon report on strategic computing. Doubts About Achieving Goal However, some computer science specialists say privately that achieving such goals may not be possible within the project's five-year limit. ''Much of the research going on now is being conducted in strictly controlled environments such as college campuses, and the products of this research must eventually face enormously more complicated challenges such as encountering other objects moving at different speeds,'' said one computer scientist who requested that he not be identified. ''I think you can expect to see one of these vehicles moving independently in a constrained environment at a reasonable speed in the near future,'' he added, ''but moving independently in the real world which is occupied by other moving objects and differing terrain, well that's quite a way off.'' But a more optimistic opinion was offered by Dr. Warren P. Seering of M.I.T.'s Artificial Intelligence Laboratory. ''There is a great deal of technology already developed that has yet to be applied to solving these problems,'' he said. ''I think the overcoming of even some of the biggest problems is going to come faster than some people believe.'' End of Document Brain Gain The New York Times

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James Gleick is an assistant metropolitan editor of The Times. By James Gleick OU'RE LOOKING AT A NEWSPAper comic page and your eye falls on today's jumble. It's an anagram puzzle. You have to turn a few scrambled letters into a word. LOONDERK. A tough one. KRONDOLE. KNOODLER. Close. Patterns form and re- form in your mind. Actually, in this case there isn't even a word there, but at least the patterns look like words. Implausible combinations like EOKDNLRO and NRDOEOKL never leap to mind. This isn't like doing arithmetic - there are no rules to tell you how to make these patterns. No conscious logic decides how to tear the letters apart and put them back together. It just happens, with a delicacy that belies the power of the decision making. The regrouping is fast, subtle and fluid. Or so it is when Douglas R. Hofstadter, computer scientist and Pulitzer Prize-winning author, does Jumbles. ''I have an unbelievably rapid way of exploring the space,'' he says, writing KNOODLER on his blackboard at Indiana University. ''These words just appear in front of me. Then something else appears, or two or three things, over and over again, new possibilities and new combinations - and always English sounds or close to them.'' He looks at the letters. A grin appears and disappears under a mass of unruly black hair. ''I don't make any conscious decisions - I don't say, well let me try this, let me try that. Instead, instantly, the whole word is built in my mind - like that.'' In the blossoming field of artificial intelligence, where scientists are trying to make computers simulate sophisticated human abilities, Hofstadter's colleagues have little interest in trivia like Jumbles. Many of them are working on expert programs that can prospect for oil or diagnose diseases, and they have made great and well-publicized strides that just a few years ago would have seemed inconceivable. It's no longer astounding to hear about computers imitating anything from a psychiatrist to a schizophrenic. Yet some of the abilities that add up to intelligence - abilities as simple as recognizing the letter A, or predicting the next number in a sequence (1-2-2-3-3-3-?), or doing Jumbles - have stayed as mysterious as ever. Generally, what people can do without thinking, computers cannot do at all. So Hofstadter is writing a computer program that will try to unscramble Jumbles. In one way, it's a trivial problem. It would be easy to let a computer solve Jumbles by mechanically listing every possible permutation of the letters and checking the results against a dictionary of English words. A program like that, relying on raw, stupid computing power, wouldn't even qualify as artificial intelligence - it would be like untying shoelaces with a buzz saw. Hofstadter wants his program to do its thinking the same way he does, deep below the level of consciousness, without logic but with fluidity. He wants a program with an understanding of how words are put together - a program that won't waste a millisecond on ODKNRLEO, but will pause seriously to consider KNOODLER. Above all, he wants the mental juggling and the flash of inspiration. With his Jumbles and with some other programs, equally unprepossessing, Hofstadter is reaching for the very heart of thinking. He is trying to simulate not the most sophisticated thought processes, but the most basic. His developing theory of the mind - and it is a real theory, although his conversation and his writings often seem as wild and multidirectional as a fireworks display - has begun to draw a wide following through two successful books, including ''G"odel, Escher, Bach,'' and a monthly magazine column, with a collection of essays to come in late 1984. And Hofstadter, in lectures around the country and in an especially provocative paper not yet published, has also begun causing a stir in the academic world - not in his own field, where his ideas are far from popular, but among some philosophers of mind, who believe he is claiming a territory all his own at the increasingly busy crossroads of artificial intelligence, neuroscience and philosophy. The three fields are coming together as never before, providing new approaches to some of the most fundamental questions of how the mind works. When you think about yourself, what is being thought about and what is doing the thinking? Can machines be taught the most human of human traits - creativity, inspiration, imagination? How does a brain of neurons and synapses come to be aware of itself as a mind? In seeking answers to such questions, Hofstadter - a 38-year-old associate professor of computer science with a background in mathematics and physics, a love of music and language and a weakness for puns - is an unlikely philosopher. But in his own modern way, he is reinventing the human soul. ''A lot of people believe that there is nothing going on when you perceive,'' Hofstadter said, stepping away from his blackboard to a desk covered with papers and unanswered mail. ''They say: 'I see a book there. It's instant! It doesn't take any time at all! There can't be any processing or computing going on there. It's just obvious.' '' Yet whatever unconscious process manages such tasks is so subtle and so powerful that it has eluded the best efforts of artificial intelligence. ''Memory, too,'' he said. ''To see something you haven't thought of for years float effortlessly to the surface of the mind is a great mystery.'' When Hofstadter looks at KNOODLER, so frustratingly close to a word and so unexpectedly elegant that he is reluctant to take it apart and try something else, it reminds him of a summer day in 1966 when he looked in all the streets and shops of a small Danish fishing town and then stood waiting for a friend on a long and beautiful pier - reluctant to give up and look elsewhere. Somehow the two moments, separated by 17 years, had exactly the same emotional flavor. ''But when you try to describe the connection,'' he said, ''it's unbelievably abstract - so abstract you couldn't in 10 years get a program to see the connection.'' There are no conscious rules for it, just as there are no conscious rules for retrieving a tip-of-the-tongue piece of memory that is just out of reach. But some part of the mind is doing some very hard work. Perception. Memory. Analogy. Regrouping. ''Abilities to do very simple things, to take things apart and put them back together again in new ways, that's so much at the root of creativity,'' Hofstadter said. ''When a composer like Bach composed fugues, you can practically see the wheels churning. You can see Bach taking things apart and putting them back together - you can see that incredible fluidity.'' He is trying to build that same fluidity into his computer programs, by organizing them the way he believes the human mind must be organized. HESE ARE VERY EXCITING times in philosophy of mind and artificial intelligence and the neurosciences, which are also exploding,'' said Paul M. Churchland, professor of philosophy at the University of Manitoba. He has been working at the Institute for Advanced Study in Princeton, N.J., where Hofstadter addressed a conference early this spring. ''In the last 10 years, maybe only in the last two years, they've seriously discovered one another, and Hofstadter is doing a great deal to make it one great interactive ball of activity. So much that the suspicion is that there are three Doug Hofstadters working in cycles to produce all the work he does.'' The challenge presented by the revolution in artificial intelligence is to show how one might create a mechanical model for the mind - and not just any model, but one that expresses all our wonder at the spark of human inspiration and the power of human will. Although that is a distant goal for computer scientists, many philosophers are intrigued by theories that have already begun to develop out of their work. For anyone, in fact, who thinks about thinking, the ferment is turning these fields into a lively spectator sport. There are plenty of spectators. Hofstadter's first book on these matters, ''G"odel, Escher, Bach: An Eternal Golden Braid,'' published by Basic Books, won the 1980 Pulitzer Prize for general nonfiction and then went on to indisputable distinction as the hardest-to-read book ever to spend five months on the trade paperback best-seller list. The book was initially turned down by several publishers, including Indiana University Press, where a reader called it ''a formidable hodgepodge,'' and it was widely misunderstood even by some reviewers who admired it. It's no wonder. The book is a richly woven enigma, exploring Bach's fugues, M. C. Escher's drawings and Kurt G"odel's notorious Incompleteness Theorem, the ultimate spoilsport of modern logic, which declares that any attempt to build a complete and consistent logical system will inevitably be ruined by undecidable propositions. Riddled with wordplay, mixing mathematical discursions with fanciful dialogues, ''G"odel, Escher, Bach'' carries readers through the central problems of contemporary philosophy of mind. The book has sold well over 300,000 copies in hard cover and paperback, and is now bringing sweat to the brows of translators in Japanese and a half- dozen European languages. Hofstadter has also continued to reach thousands of readers in an unusual Scientific American column devoted, apparently, to nothing more or less than the idiosyncratic world view of Douglas Hofstadter. His publisher, Martin Kessler of Basic Books, plans to bring out a collection of his essays next year - ''precisely,'' as Kessler put it, ''in order to define what might be called the Hofstadter perspective.'' Despite his enormous popular appeal - and in some cases, because of it - Hofstadter has put himself at odds with the more practical segment of his own field of artificial intelligence. He is well aware that academics tend to mistrust new ideas arriving in splashy guises. But he persistently plays up to that prejudice by filling his writings with talking animals, bizarre coinages and more than any man's fair share of bad puns. It doesn't help that he writes scholarly articles with titles like ''Who Shoves Whom Around Inside the Careenium?'' in the form of dialogues between Achilles and Tortoise - favorite Hofstadter characters borrowed, via Lewis Carroll, from an ancient Greek paradox of infinity. Nor did it help that he wrote Scientific American's cover story on Rubik's Cube, just before it became a pop culture craze. Hofstadter has also become a player in a profound debate that is taking shape in artificial intelligence, between technologists and scientists, between the pragmatic and the theoretical. Some programmers have managed to keep a foot in each door. But many have turned from pure science to programs that accomplish a specific high-level task, successfully simulating some piece of intelligent behavior. These ''expert'' programs are best suited to meeting the immediate needs of industry, and many computer scientists have left the universities to join private companies with names like Symbolics and Teknowledge. In the meantime, there is much disagreement inside and outside of the technical community about just what computers can do. ''These are days of hype about computers,'' Hofstadter said. ''People are being asked to change overnight from a view of computers as basically stupid to the idea that computers are our partners in evolution. Not enough people are saying, wait a minute, how do we really think, what is consciousness, where does our sense of self come from.'' None of which is to dispute the value of the less theoretical contributions in the field. After all, the development of the jet plane may not have contributed much to our theoretical understanding of how birds fly, but it hasn't been without a certain practical utility. If any one person was responsible for the growth of artificial intelligence over the last decade, it was Marvin Minsky, Donner Professor of Science at the Massachusetts Institute of Technology, where the computer science department has suffered heavily from the lure of industry. Minsky, a pioneer in the field since before it had a name, describes the new debate in terms of what might be called the Bird's Nest Problem. Like Hofstadter, Minsky has a vision of artificial intelligence striving to simulate the mind in all its richness. He regrets the preference of many in his field for programs that can do commercially useful ''performance'' tasks that seem complicated but sidestep the most fundamental problems. Such programs can be refined endlessly and taught ever- fancier tasks, but they remain too stolid to adjust to the kind of unpredictability that the real world is so fond of throwing in our paths. An inspired chess- playing program might be able to trounce a good player, but change the rules a little - let knights move twice, or let pawns move backward, or make the board 9 by 9 - and the machine will be at sea, while the human player will manage to cope. Expert systems are by no means the whole story of artificial intelligence these days. Many scientists have continued to work on issues of language, of learning, of planning. But none have managed to teach a machine to handle the variation and complexity of real life. That's the Bird's Nest Problem. ''Nobody's ever tried to make a machine that could build a bird's nest,'' Minsky said. ''Instead they're all out there in factories assembling motors. People say, oh yes, the bird gets straws and it sticks them in the nest and glues them in. But a motor is designed to be put together. The debris lying around on the floor of a forest isn't designed to be made into nests.'' Industry needs programs that work now, not programs that point the way to a cognitive science of the future. And the quickest way to make a program accomplish a sophisticated task is to write a sophisticated set of instructions for the computer to follow, step by step, one after another. An expert system takes a particular kind of expert behavior - medical diagnosis, for example - and imitates it, with the help of rules abstracted from the way people perform the same tasks. A diagnosis program might tell the computer to begin with certain questions, just as a doctor would. Then a particular response might guide the computer to a particular set of follow-up questions. The paths of questions and answers can go in an intricate variety of directions. The patient's responses can be analyzed against a data base containing information about vast numbers of diseases. A world of medical experience can be written in, and the results can be truly impressive. They are leagues beyond the routine programs used by scientists and businesses for calculating, sorting or filing. But they don't match the creativity of even the most pedestrian doctor. ''The problem is,'' said Roger C. Schank, head of Yale University's artificial intelligence laboratory, ''what you've done at that point is just written down a set of rules. You haven't got a system that can then form its own rules. What you get now are machines that are intelligent enough to do some stuff, but not intelligent enough ever to surprise you.'' Schank, who has also formed a private company, Cognitive Systems, agrees that expert systems are leaving the most important issues of intelligence untouched. He believes the answer is to keep writing rules, but more flexible ones - rules that will tell the computer how to learn and change. As long as programmers provide the rules, however, the problem of predictability seems inescapable. All the initiative, all the goal setting, all the things that resemble free will come from outside the machine. Hofstadter describes a different approach, based on his view of the subconscious processes of our own minds. Reasoning comes not first but last. Instead of beginning with an overall algorithm, or set of rules, he begins with many small pieces of computer code acting almost independently. ''You don't write the thinking algorithm. It's not that you dictate from on high, first this will happen, then this will happen and so on. ''What you do is, you write a lot of algorithms for little teeny structures and then you allow them to interact in a certain way. You also write the algorithm for how they interact, but you let them, in some sense, swim and interact together. In essence, you let them nondeterministically interact with each other, and it's the sum total of how they work together that creates intelligence.'' In the anagram program, which he calls ''Jumbo,'' one tiny part - a ''spark'' - might pick a couple of letters and put them together. Simultaneously another spark might be looking at other letters, or groups of letters. Meanwhile, a higher-level part - a ''flash'' - might be checking a couple of sparks. ''There are quick tests for affinity and slightly longer tests for affinity. You can imagine such tests at all levels.'' All the time, groups of letters might be formed and broken apart again until gradually, out of the simultaneous swimming together of the many parts, a pattern begins to emerge. No one is telling the computer to create a certain kind of pattern. No one knows exactly what kind of pattern will be created. It just happens. Or would, if the program worked as well as Hofstadter hopes it will. So far, it doesn't, and most of his colleagues - including Schank - believe that they are on firm ground in viewing his approach with skepticism. But some, like Minsky, believe that history will be on Hofstadter's side. They argue that expert systems, no matter how impressive they seem, will be a dead end, never learning to find the deep connections between concepts, recognize patterns, carry tasks beyond the instructions set for them. ''Somebody's got to spend a few years asking just what does it take to do the things we take for granted,'' Minsky said. ''That's what Hofstadter is doing. He's one of those people of whom, 50 years from now, they'll say he was on the right track and they should have listened more. ''Hofstadter's philosophical ideas on how the mind works are just about the best in the world today,'' Minsky said. ''He's laying out the future - and people are not reacting because there are too many details to do first.'' HEN HOFSTADTER IS home in Bloomington, he rides his bicycle between a cluttered Indiana University office and his even more cluttered house, where he lives alone. As any Hofstadter reader would instantly see, the clutter is the same stuff that spills off every page of his writing. Escher reproductions on the walls. Bach and Chopin scores on the piano. Dozens of Rubik's Cubes and cube spinoffs, including a 5-by-5-by-5 version that he is not quite ready to scramble. Tortoises everywhere: porcelain tortoises, metal tortoises, wooden tortoises, even a tortoise footstool on which Hofstadter perched happily when I went to see him. ''It's a friendly beast,'' he said. His living-room floor was piled with letters from readers. He gets 40 to 60 a week, mostly in packets forwarded by Scientific American. A minister wrote enclosing a sermon he had delivered about ''G"odel, Escher, Bach.'' A photographer said he had bought a Chopin recording after reading Hofstadter's column on Chopin and the spirit of Poland. But most were just people asking for guidance on questions as simple and as profound as one at the top of the pile, from a man suddenly struck with helpless curiosity about the nature of the difference between right and left. ''They all want me to say something to them - why is the universe the way it is,'' Hofstadter said. He cannot begin to answer them all, but he has been in love with such mysteries all his life. Douglas Richard Hofstadter was born in New York City on Feb. 15, 1945, and grew up near Stanford University, where his father, the Nobel Prize- winning physicist Robert Hofstadter, still teaches. ''As a child growing up in a family where physics was being done, I was incredibly absorbed by words like photon and neutrino,'' Hofstadter said. ''I thought the most exciting thing in the world would be to be an antineutrino - the idea was too mysterious for words. And from the beginning I was fascinated by numbers - each number, it seemed, had some kind of magical property, and there was a sense of mysticism about it all, of being in tune and in touch with God.'' He threw himself into mathematics and languages and later the piano. When he was still in high school, and computers were two decades away from becoming a household item, he managed to get access to Stanford's. ''I was a cocky young kid, and if I could push the button, I would sneak in there and do it. I'd have my program on cards, put them in the hopper and watch the line printer chunking along. Chunk, chunk.'' Hofstadter went to Stanford, graduating in 1965, and eventually began a miserable struggle with his father's specialty, particle physics, at the University of Oregon. By the time he got his doctorate, he knew he was no physicist. ''I was a recursion- crazed mathematician who happened to have found the right problem in physics, and I began training myself to be an A.I. person: what I had always been if I had been paying attention.'' He was also already writing out in pen what eventually became ''G"odel, Escher, Bach.'' The book was published in 1979, and its huge popular success astonished both Hofstadter and Basic Books, which had brought out a modest first printing of 5,000. It did little for Hofstadter's relations with the orthodox academic world. ''When 'G.E.B.' started appearing on the paperback best seller list, I was pleased and appalled - appalled because it was making my name mud in academia. My chief rivals were 'The Joy of Sex' and a book on how to have thinner thighs. Then there was a Tom Robbins book, 'Still Life With Woodpecker' - for weeks he and I jockeyed back and forth. It was a terrible case of mixed feelings. I wanted to get ahead of him, but at the same time I was ashamed of being on the list.'' ''I never expected the cult reaction,'' he said. ''The reaction from fans, fanatics. And yet I never expected that it would be so ignored by A.I. people. I've felt very cold-shouldered by the A.I. world. ''A lot of people in A.I. come from a mathematics or logic background. They're interested in deduction, and they're bewitched by the glitter of a fancy expert system.'' For philosophers who believe that intelligence can be mechanized, a stumbling block has always been the question of who will be doing the programming for an intelligent computer - when a machine is thinking, who is telling it what to think? Where is the ''I''? It is a machine version of one of the most ancient philosophical conundrums - a mind-body problem in the tradition of Plato and Descartes. Some philosophers of mind have lately become fascinated with a possible road to an answer, beginning with the fundamental problems that have persistently defied programmers. Take the letter A. Hofstadter has hundreds of them on his office wall, in a poster cataloguing a variety of typefaces. They are all different, but they are all A's. How to recognize letters in any of the many shapes they can take was one of the classic early problems of artificial intelligence. But it was largely abandoned in favor of programs that could read a narrow range of specially designed characters, like the numerals on bank checks. The computer program has not yet been written that can tell any recognizable A from any B. What is an A, anyway? The basic form buried in most people's minds seems to be a pair of slanting uprights and a crossbar. Yet people identify A's in limitless incarnations, with curved lines or broken lines or double lines, with flourishes and curlicues, upside-down or sideways, black-on-white or white-on- black, with or without uprights and crossbar. The process is instantaneous, and it is easy to suppose there is nothing to it - until you try to teach a machine to do it. In a real sense, to solve the letter- recognition problem would be to solve the whole problem of perception. More than that, the exploration of processes below the level of conscious thought may begin a path to the deeper problems of mechanizing inspiration and self- awareness. That is the prospect that so tantalizes philosophers. Some of these issues are raised in a new paper by Hofstadter with the uncharacteristically forgettable title ''Artificial Intelligence: Subcognition as Computation.'' It will not be published until fall, but copies have already percolated through several layers of the academic world, stirring special interest among some philosophers of mind. ''It impressed me enormously,'' said Churchland of the University of Manitoba. ''It turned around in one fell swoop any tendency I might have had to think of Doug as a popularizer. He's standing back a few steps and taking a large look at the course of A.I., remarking on where its successes have come and where the frustrating failures have come. And he has offered a suggestion on how the barrier might be broken through.'' Hofstadter argues that artificial intelligence has been caught up with mimicking logic and deduction, at the expense of the more mysterious processes of subcognition. It is a sharp critique. ''It is my belief,'' Hofstadter says, ''that until A.I. has been stood on its head and is 100 percent bottom-up, it won't achieve the same level or type of intelligence as humans have.'' Needless to say, in the artificial intelligence world, the paper's reception has not been warm. The response from the technical community generally runs something like this: Hofstadter has demonstrated no useful working program. He makes strong claims about where true intelligence will and will not be found, but does not back them up with technical work. He offers theories that appeal to philosophers, but philosophers do not have the same need for scientific proofs. One particularly successful scholar of artificial intelligence is Allen Newell of Carnegie-Mellon University. ''He's trying to make the case that intelligence is somehow emergent out of the lower- level stuff,'' Newell said. ''But I don't think he has produced a technical sort of proposal there to support the rhetoric.'' In Newell's view, the current approach to his field is succeeding - it is where almost all the progress has been made. Hofstadter's approach, he says, is plausible, but only plausible. ''One can certainly have the hypothesis,'' he said. ''And in fact that may be right. But I don't know of any evidence for it in the way Doug talks about it in that paper. He wasn't actually providing enough technical stuff. ''There's a coin of the realm in A.I. with respect to running programs that demonstrate things. And of course that attitude doesn't exist in philosophy - philosophy has its own ethos.'' It is true that philosophers, even those drawn to the ideas coming out of computer science and artificial intelligence, do not place a high premium on experimental proofs. ''Psychology never has been and never will be like physics,'' said Judson C. Webb, a philosopher and logician at Boston University. ''Most questions you don't have a ghost of a chance of ever settling by experiment.'' Still, to scientists like Newell and like Schank at Yale, a working demonstration would be more convincing than mere theorizing, and the undeniable fact is that Hofstadter is not putting forward working programs. ''Maybe Hofstadter is a philosopher,'' Schank said, ''but you can't say such a person is an A.I. person. He's a popularist.'' ''Actually,'' said Webb, ''other people think that about Schank. Artificial intelligence is a curious field, I must say - it's often difficult to distinguish the cranks and the geniuses. But Hofstadter has a fertile, seminal mind, and the ideas he deals with have attracted the attention of philosophers more and more.'' Even so, the criticism within his chosen field has rankled Hofstadter ever since ''G"odel, Escher, Bach,'' which he believes was misunderstood by laymen and professionals alike. ''It does not seem like a technical contribution,'' he said. ''It does not seem like a working program. It does not seem like a set of theorems. It does not seem like a set of proposals for how a program should be organized. What saddens me is that so many A.I. people seem trapped in their already-formed modes of thought and their preconceptions. They tend to eschew the whole question of what consciousness means. They avoid the questions of philosophy of mind.'' The book drew the attention of a few philosophers early on. Raymond Smullyan, a philosopher and logician at the City University of New York, shares Hofstadter's delight with paradox and puzzle-making, and he believes the book will have a lasting effect on the way people think about the mind. ''It may not have been academically influential,'' he said, ''but it is culturally influential.'' Several of the major philosophical journals have now reviewed the book. ''It weighs in to a very juicy area,'' said Boston University's Webb, who has prepared a long and appreciative review for the Journal of Symbolic Logic. The academic grapevine that brought Churchland the subcognition paper went by way of Daniel C. Dennett, professor of philosophy at Tufts University and a former president of the Society for Philosophy and Pyschology. He first met Hofstadter in 1980, in Stanford, Calif., where they were both studying artificial intelligence - Hofstadter as a Simon F. Guggenheim fellow at Stanford University, Dennett as a fellow of the Center for Advanced Study in the Behavioral Sciences. By then, of course, Dennett knew of ''G"odel, Escher, Bach.'' ''My initial bias,'' he recalled, ''was that a book with that title and that subtitle couldn't possibly be any good, that it would be a sort of West Coast, oh wow book. But of course it isn't anything of the kind. It's an amazingly rich and intricate book.'' Out of their conversations at Stanford came a collection, called ''The Mind's I: Fantasies and Reflections on Self and Soul,'' of pieces by novelists, scientists and logicians with commentaries by Hofstadter and Dennett. It has sold well over 100,000 copies in hard cover and paperback. Since then Dennett has followed Hofstadter's work closely, most recently citing it this spring in a series of lectures at Oxford University on free will. ''He develops ideas that have been bandied about by philosophers for years, but nobody has done it with the depth and the care and the detail, and nobody has exploited the idea as richly as Hofstadter,'' said Dennett. ''He has found a way of characterizing the contribution of the computer metaphor to the understanding of the mind which is realistic and flexible and not ideological and programmatic. ''To philosophers who think that's the way to go in solving the mysteries of the mind, Hofstadter's work is as sophisticated as anything anybody's done. In fact, that's something of a bandwagon these days, and to get on that bandwagon you've got to pay attention to Hofstadter.'' Hofstadter has no shortage of metaphors for the mind. An ant colony. A labyrinth of rooms, with endless rows of doors flinging open and slamming shut. A network of intricate domino chains, branching apart and rejoining, with little timed springs to stand the dominoes back up. Velcro-covered marbles bashing around inside a ''careenium.'' A wind chime, with myriad glass tinklers fluttering in the cross-breezes of its slowly twisting strands. Most educated people today accept the idea that the brain is purely a thing of flesh and blood, neurons and axons and synapses. For most, religious faith in a noncorporeal soul is no longer the answer it may have been a century ago. The problem is to reach a modern understanding of how the glories of the mind might spring from pure matter. For anyone with a view of the mind as creative and self- aware - anyone, that is, with the vista on the soul that comes from looking inward - it is extremely unsatisfying to think of it as nothing but electrical impulses and biological tissue. ''Tissue isn't quite the right word,'' Hofstadter remarked. ''Pattern, I would say.'' Hofstadter's sense of the soul as pattern is the core of his view of how thoughts and symbols might be built up from the physical structures that neuroscientists see in their microscopes. It hardly matters whether the pattern is rooted in the firing of neurons or the marching of ants. Or the switching of silicon chips. ''The medium is different,'' as Achilles says in one of Hofstadter's recent dialogues, ''but the abstract phenomenon it supports is the same.'' Whatever the medium, Hofstadter's path to consciousne

Time: 11/09/2011  
appears to be in the driver's seat en route to a win, as it leads 51-10 after the third quarter. Wisconsin added to its lead when Russell Wilson found Jacob Pedersen for an eight-yard touchdown to make the score 44-3 ... . '' Those words began a news brief written within 60 seconds of the end of the third quarter of the Wisconsin-U.N.L.V. football game earlier this month. They may not seem like much -- but they were written by a computer. The clever code is the handiwork of Narrative Science, a start-up in Evanston, Ill., that offers proof of the progress of artificial intelligence -- the ability of computers to mimic human reasoning. The company's software takes data, like that from sports statistics, company financial reports and housing starts and sales, and turns it into articles. For years, programmers have experimented with software that wrote such articles, typically for sports events, but these efforts had a formulaic, fill-in-the-blank style. They read as if a machine wrote them. But Narrative Science is based on more than a decade of research, led by two of the company's founders, Kris Hammond and Larry Birnbaum, co-directors of the Intelligent Information Laboratory at Northwestern University, which holds a stake in the company. And the articles produced by Narrative Science are different. ''I thought it was magic,'' says Roger Lee, a general partner of Battery Ventures, which led a $6 million investment in the company earlier this year. ''It's as if a human wrote it.'' Experts in artificial intelligence and language are also impressed, if less enthralled. Oren Etzioni, a computer scientist at the University of Washington, says, ''The quality of the narrative produced was quite good,'' as if written by a human, if not an accomplished wordsmith. Narrative Science, Mr. Etzioni says, points to a larger trend in computing of ''the increasing sophistication in automatic language understanding and, now, language generation.'' The innovative work at Narrative Science raises the broader issue of whether such applications of artificial intelligence will mainly assist human workers or replace them. Technology is already undermining the economics of traditional journalism. Online advertising, while on the rise, has not offset the decline in print advertising. But will ''robot journalists'' replace flesh-and-blood journalists in newsrooms? The leaders of Narrative Science emphasized that their technology would be primarily a low-cost tool for publications to expand and enrich coverage when editorial budgets are under pressure. The company, founded last year, has 20 customers so far. Several are still experimenting with the technology, and Stuart Frankel, the chief executive of Narrative Science, wouldn't name them. They include newspaper chains seeking to offer automated summary articles for more extensive coverage of local youth sports and to generate articles about the quarterly financial results of local public companies. ''Mostly, we're doing things that are not being done otherwise,'' Mr. Frankel says. The Narrative Science customers that are willing to talk do fit that model. The Big Ten Network, a joint venture of the Big Ten Conference and Fox Networks, began using the technology in the spring of 2010 for short recaps of baseball and softball games. They were posted on the network's Web site within a minute or two of the end of each game; box scores and play-by-play data were used to generate the brief articles. (Previously, the network relied on online summaries provided by university sports offices.) As the spring sports season progressed, the computer-generated articles improved, helped by suggestions from editors on the network's staff, says Michael Calderon, vice president for digital and interactive media at the Big Ten Network. The Narrative Science software can make inferences based on the historical data it collects and the sequence and outcomes of past games. To generate story ''angles,'' explains Mr. Hammond of Narrative Science, the software learns concepts for articles like ''individual effort,'' ''team effort,'' ''come from behind,'' ''back and forth,'' ''season high,'' ''player's streak'' and ''rankings for team.'' Then the software decides what element is most important for that game, and it becomes the lead of the article, he said. The data also determines vocabulary selection. A lopsided score may well be termed a ''rout'' rather than a ''win.'' ''Composition is the key concept,'' Mr. Hammond says. ''This is not just taking data and spilling it over into text.'' Last fall, the Big Ten Network began using Narrative Science for updates of football and basketball games. Those reports helped drive a surge in referrals to the Web site from Google's search algorithm, which highly ranks new content on popular subjects, Mr. Calderon says. The network's Web traffic for football games last season was 40 percent higher than in 2009. Hanley Wood, a trade publisher for the construction industry, began using the program in August to provide monthly reports on more than 350 local housing markets, posted on its site, builderonline.com. The company had long collected the data, but hiring people to write trend articles would have been too costly, says Andrew Reid, president of Hanley Wood's digital media and market intelligence unit. Mr. Reid says Hanley Wood worked with Narrative Science for months to fine-tune the software for construction. A former executive at Thomson Reuters, he says he was struck by the high quality of the articles. ''They got over a big linguistic hurdle,'' he observes. ''The stories are not duplicates by any means.'' He was also impressed by the cost. Hanley Wood pays Narrative Science less than $10 for each article of about 500 words -- and the price will very likely decline over time. Even at $10, the cost is far less, by industry estimates, than the average cost per article of local online news ventures like AOL's Patch or answer sites, like those run by Demand Media. NARRATIVE SCIENCE'S ambitions include moving further up the ladder of quality. Both Mr. Birnbaum and Mr. Hammond are professors of journalism as well as computer science. The company itself is an outgrowth of collaboration between the two schools. ''This kind of technology can deepen journalism,'' says John Lavine, dean of the Medill School of Journalism at Northwestern. Mr. Hammond says the combination of advances in its writing engine and data mining can open new horizons for computer journalism, exploring ''correlations that you did not expect'' -- conceptually similar to ''Freakonomics,'' by two humans, the economist Steven D. Levitt and the author Stephen J. Dubner. Mr. Hammond cited a media maven's prediction that a computer program might win a Pulitzer Prize in journalism in 20 years -- and he begged to differ. ''In five years,'' he says, ''a computer program will win a Pulitzer Prize -- and I'll be damned if it's not our technology.'' Should it happen, the prize, of course, would not be awarded to abstract code, but to its human creators. http : // www.nytimes.com Graphic PHOTO: From left, Kris Hammond, Larry Birnbaum and Stuart Frankel of Narrative Science, a start-up in Evanston, Ill., whose software turns data into news articles. (PHOTOGRAPH BY PETER WYNN THOMPSON FOR THE NEW YORK TIMES) DRAWING (DRAWING BY LLOYD MILLER) Load-Date: September 11, 2011 End of Document A Moody Robotic Chimp With Eyes That Can Track Your Every Move The New York Times

Time: 28/06/2010  
Calif. -- The film ''2001: A Space Odyssey'' presents a dramatic vision of the future, where sentient robots double as secretaries, performing daily tasks and simple services for their human masters. Now, SRI International, the research institute, is hoping to bring the concept of virtual personal assistants closer to reality -- without the malevolent malfunctions, of course. ''We are looking to augment human capability,'' said Norman Winarsky, vice president for licensing and strategic programs at SRI. ''But with artificial intelligence.'' Established in 1946 by Stanford University, SRI created early prototypes of the computer mouse and the technologies involved in ultrasound and HDTV. Although SRI does roughly 80 percent of its work for the federal government, many of its technologies have been adapted for commercial purposes. Recently, the institute has set its sights on the mobile phone and Web market, especially on creating applications that perform personal functions. ''We have companies in every space: drug discovery, flexible circuits, new medical devices, solar, clean tech,'' said Mr. Winarsky, who oversees the establishment of new companies that are spun off from SRI. ''But right now, half of the companies we're thinking of creating are strongly related to virtual personal assistants.'' SRI's newest venture is a Web-based personalized news feed, Chattertrap, that monitors what people are reading to learn what they like, and then serves up articles and links that suit their interests. Another recent project is a mobile application, Siri, that allows people to perform Web searches by voice on a cellphone. Siri users can speak commands like ''find a table at an Italian restaurant for six at 8 tonight,'' and the application can translate the request and use GPS functions and search algorithms to find an answer. Siri's software is sophisticated enough that over time, it can even remember if someone prefers places that serve Northern Italian cuisine, rather than Sicilian, and make recommendations around that preference. The application has already been a big hit; in April, Apple acquired Siri for a price said to be as high as $200 million. But some analysts wonder whether SRI will be able to duplicate this kind of success. Variations on the virtual personal assistant concept have been around for a while. Two services, for example -- Remember the Milk and Jott -- are types of electronic crutches intended to help users be more efficient at ticking off items in their daily to-do lists. But SRI is betting that its expertise in artificial intelligence will help make software that can break away from the pack. And it has high hopes that Chattertrap will be as successful as Siri. ''The popular news sites aren't always the most interesting,'' said Gary Griffiths, one of the two entrepreneurs SRI recruited to guide Chattertrap. ''But by using technology to evolve with you as you use it, watching what you're doing and giving more of what you like and less of what you're ignoring, we can create a very personal information service.'' Although Chattertrap is in a limited test period right now, the company hopes to allow more users later this summer and release the product in its entirety by the end of the year. Chattertrap has already caught the eye of Li Ka-shing, a Chinese billionaire who has invested in Facebook and the music-streaming service Spotify. Mr. Li recently led a $1.5 million round of venture financing in the Chattertrap project. SRI's newfound interest in mobile and Web applications was born, in part, from a research project commissioned by the Defense Department to develop software that can learn, in an effort to create a more efficient way for the military to communicate and stay organized in the field. The project's underlying technology, a combination of adaptive machine learning and natural-language processing, has spawned several offshoots. Each year, SRI tests the marketability of roughly 2,000 technology ventures, but typically only three or four are ever established as independent businesses. Charles S. Golvin, an analyst with Forrester Research who follows the mobile industry, said SRI was tapping into the mobile market at a time when the need to simplify searching is greater than ever. ''The old paradigm of having a desktop computer in front of you with a large screen to search around for what you want is going away,'' Mr. Golvin said. ''More and more, the information you want online is coming from the palm of your hand.'' Since most mobile phones have small, cramped screens and tiny keyboards, voice-activated search and speech recognition become much more powerful, Mr. Golvin said. ''It's a very compelling offer for a mobile company,'' he said. In addition, companies like Apple and Google are sizing up the market opportunity for location-based search and the potential advertising opportunities that come with it, said Brent Iadarola, director of mobile research at Frost & Sullivan. ''The acquisition that Apple has made provides powerful clues as to what the mobile landscape will look like in the future,'' Mr. Iadarola said. ''When you're in a mobile environment there's a higher propensity to spend, and tying that into mobile advertising could be lucrative.'' Still, he said, it's not clear yet whether SRI can recreate the same type of successes it had with Siri with its future virtual personal assistants. ''That was hitting it out of the ballpark, in my opinion,'' he said. ''I don't know if they can replicate that.'' Mr. Winarsky said the intellectual property licensed to Apple as part of the acquisition of Siri is a fraction of what has been generated by the institute. ''Siri is the first and in some cases, the simplest, of what we'll do,'' he said. Mr. Winarsky said SRI was in the early stages of determining what will be the next start-up to become an independent company. One area he is particularly excited about is translation, he said. ''Virtually every industry and platform has a need for translation services,'' he said. In addition, he said, a virtual personal assistant could be of great use to the health industry and patients, by helping figure out which procedures are covered by insurance or quickly finding and booking a doctor's appointment. ''We'll only be able to tell in 20 years,'' he said. ''But I truly believe this is the dawn of a new era of artificial intelligence. It is on the vanguard of a great revolution in computer science.'' http : // www.nytimes.com Graphic PHOTOS: Above left, Norman Winarsky, a vice president at SRI. Above right, the founders of Chattertrap, a kind of personal assistant, David Schairer, left, Henry Nothhaft Jr. and Gary Griffiths. (PHOTOGRAPHS BY PETER DASILVA FOR THE NEW YORK TIMES) (B4) Load-Date: June 28, 2010 End of Document SMARTER THAN YOU THINK; Trying to Forge A Friendship With a Robot Named Bina48 The New York Times

Time: 26/04/2009  
New computer software products using techniques developed by artificial intelligence researchers are helping a growing number of employers and insurers to audit some of the 1.5 billion doctor and hospital bills submitted each year for insurance payment. Some software products detect bills that charge separately for procedures that are ordinarily included in an overall, lower fee. Other programs call attention to unusually high or frequent charges. And some even help an insurer decide whether a patient needs surgery, whether for bunions, cataracts or a coronary artery bypass. In each case, the software only makes recommendations, leaving to the insurer the final decision on whether to deny payment. While these products are new, the technology for this kind of work is not. ''The principle is very much like auditing tax returns,'' said Esther Dyson, editor of Release 1.0, a software newsletter. ''Certain things raise red flags.'' But at the same time, a small industry has sprung up to produce newsletters, seminars and products to help doctors and hospitals increase their revenues, as well as to improve efficiency. ''We go to their seminars to find out what they are doing,'' said Marshall V. Rozzi, executive vice president of U.S. Healthcare Inc., a health maintenance organization based in Blue Bell, Pa. For example, some companies advise doctors to bill for a consultation instead of an office visit, which many insurers do not pay for. A newsletter published by St. Anthony Hospital Publications in Washington shows doctors how to divide the bill for taking cell samples from the uterus. The ''increase from correct coding,'' it says, is $112,800 a year for a physician who performs 10 such procedures a week. Some doctors justify such tactics by arguing that insurers have no right to interfere with a physician's paramount duty to care for the patient. The software products, which are called medical expert systems, are typically created by small, relatively new companies like Artificial Intelligence for Medicine, a two-year-old software company in Farmington, Conn.; GMIS, which is based in Malvern, Pa., and Health Payment Review Inc. in Boston. They license or lease claims-auditing systems to insurers, employers and H.M.O.'s. Electronic Data Systems, a unit of the General Motors Corporation that is the largest claims processor, has incorporated into its own system the software of four or five small companies that have niche products, said Bob Waid, president of the health and benefits division at E.D.S., which is based in Plano, Tex. E.D.S., which processed 375 million health-care claims last year, is adding GMIS's claims-auditing to its systems. Thomas R. Owens, executive vice president of GMIS, a company backed by Aetna, Metropolitan Life Insurance, First Boston, SmithKline Beecham and others, said more than 50 physicians in 26 medical specialties had contributed to the GMIS knowledge base. On the other side, ''there are 1,300 businesses trying to peddle software to physicians,'' said Joe Santoro, national accounts manager for the physician services division at the SMS Corporation in Malvern, Pa. The larger companies include SMS, the IDX Corporation in Boston and Cycare in Phoenix. SMS software lowers the number of rejected claims by eliminating items not covered by Blue Shield, for example. Mr. Santoro said SMS, like other software companies, has ''a consulting service - we offer them the methods to get maximum reimbursement, while staying within the confines of federally mandated restrictions.'' But claims auditors at H.M.O.'s and insurers watch for patterns they call ''creative billing.'' ''Creative billing has been a very big problem for a long time in podiatry,'' said Dr. Leslie Levy, president of Artificial Intelligence for Medicine. ''It has become an important problem in physician billing in the last two to four years.'' Dr. Levy added: ''The vast majority of physicians are not engaging in these practices, but the financial impact of a small percentage of doctors is tremendous.'' At Metropolitan Life, only 5 percent of all physicians who submit claims for outpatient care account for 75 percent of the rejected claims. The expert systems work by referring to a knowledge base of data and insights collected by physician advisers. The information is organized in logical sequences, using rules. ''The engineer listens to the physician and decides how to structure the knowledge base so it mimics the physician's decision,'' said Don Holloway, vice president for product development at Health Payment Review. ''The computer receives the claim in a five-digit code and looks for related rules like: If Code A and Code B show together, make the combination Code C,'' he said. ''For example, if the claim includes an appendectomy, our software looks into the rules and sees if the appendectomy is incidental to other surgery. Some employers pay for incidental procedures, but most don't.'' Computer experts said the knowledge base might be structured like a tree with branches. If the claim is rejected on an entry-level branch, it is shunted to other branches and more detailed questions are raised. If the process does not lead to an approval of the payment, the claimant is informed, usually by a registered nurse or physician, and may make an appeal with more information. ''We need to keep a human being in the decision-making loop,'' Dr. Levy said. He warned that insurers might be hit by lawsuits accusing them of unfairly denying payments in the event of injury attributed to the denial. Mr. Waid said E.D.S. was now trying a product developed by Health Data Institute, a unit of Baxter International based in Lexington, Mass., which passes on whether a patient should be treated in a hospital and for how long. The software guides ''utilization review'' nurses in telephone conversations with prospective patients whose health plan requires prior approval. Taking the technology a step further, a system developed by Value Health Sciences Inc. in Santa Monica, Calif., makes recommendations on the medical necessity of 35 surgical procedures. The software helps a nurse reply in a few minutes to telephone requests for authorization of surgery, said Jacqueline Kosecoff, Value Health's executive vice president. For a hysterectomy, there are 1,800 clinical scenarios, each with five or six variables. She compared the technology to ''a huge graph: the 'down' column would include variables like maximal, submaximal or no therapy.'' ''The 'across' column,'' she said, ''would include clinical scenarios.'' For example, she said, surgery might not be appropriate for a patient with a three-month history of angina who had equivocal results in treadmill tests and was not receiving the maximum benefits from drug therapy. Graphic Diagram showing the growing number of insurers using software expert systems to analyze medical claims to find costly errors and billing practices they deem inappropriate. (sources: Artificial Intelligence for Medicine Inc., GMIS) (NYT) End of Document The Mind Reader The New York Times

Time: 15/02/2011  
two years ago, Apple Computer introduced its Macintosh and began to revolutionize the way people look at computer screens. It banished the cryptic ''A'' symbol that prompts users of most personal computers to enter their first instruction, replacing it with a visual ''tool kit.'' Now, sitting in front of the Macintosh and other computers that have mimicked its easy-to-use approach, users are accustomed to picking up a fat or thin pencil, a paintbrush or an elastic rectangle to draw images on the screen and to dispose of old files by simply dumping them into an electronic trash pail. But in Silicon Valley brilliant advances in software barely take hold before someone tries to go one better. Already there is a move to leapfrog Apple, building on its intuitive approach. Much of the action is centered in the artificial intelligence laboratory at the Hewlett-Packard Company, which was caught snoozing in the early days of the personal computer boom. Now Hewlett researchers are involved in a $30 million to $50 million project to design ''software robots'' that will perform many of the tasks - including designing graphs, scheduling meetings and sifting telephone messages - that the Macintosh still leaves to humans. ''Today's PC's are good tool boxes, but they don't come with a carpenter or a plumber,'' Ira P. Goldstein, the jovial director of the Applications Technology Center at Hewlett-Packard Laboratories, said recently. ''What we want to do,'' he said, offering the first public glimpse of the project, ''is give you some intelligent assistance in how to use those tools - you act as the general contractor, they work as the specialists.'' In the tortured phraseology of the computer industry, what appears on the screen is known as the ''user interface.'' It is best envisioned as a translator: The human speaks one language, the computer processor another and the ''interface'' software mediates between the two. Ideally, it transforms the human's general wishes into the exact commands demanded by a processor. Computers can be infuriating to work with, however, because translations are rough at best. To accomplish a specific job, most computers still require excruciatingly detailed instructions. Tell a friend to meet you under the clock at Grand Central Station and he probably needs no further guidance. Tell the same thing to a computer and you have to describe precisely how to get there, inch by inch - and then say which of dozens of different clocks you mean. The idea at Hewlett-Packard, an idea that the artificial intelligence community has toyed with for years, is to develop what Mr. Goldstein calls ''agents'' that clean up those details. ''It is sort of an electronic secretary or accountant,'' he said, displaying drawings of colorful cartoon characters who would appear on a computer screen sitting at a desk, bent over a file or scratching on a ledger. ''Each one is programmed with a model of your likes and dislikes, a model of the tools available to it and a model of its task.'' Consider a basic task for an office agent: setting up a meeting. The computer user would issue a general command, perhaps, ''I want to see my top staff at a meeting in the next few days.'' Either through experience or preprogramming, the agent knows that its lethargic human master rarely rises before 10 A.M., so a breakfast meeting is out. Through electronic mail, it begins to poll the scheduling agents of other staff members. Either a meeting is set for a mutually agreeable time or the boss's agent reports back that it cannot be done. Similarly, the accounting agent could begin to set up a spreadsheet outlining next year's office budget in the format its master prefers. And a message agent might sort phone messages according to a set of priorities, putting the chairman's call on top and not bothering to pass on annoying reminders from bill collectors. ''These make you the director of the show,'' Mr. Goldstein said. ''The agents are your actors.'' Hewlett-Packard, of course, is not alone in its work. Apple, while tight-lipped about Macintosh follow-ons, is working closely with artificial intelligence specialists at Massachusetts Institute of Technology. Allan Kay, one of Apple's top scientists, is one of the leading lights in user interfaces, and a former colleague of Mr. Goldstein at Xerox's Palo Alto Research Center, where many of the early ideas for the Macintosh started. And there are doubters. ''It's pretty far-off stuff,'' said Bill Gates, the chairman of Microsoft, which did much of the key programming for the Macintosh and I.B.M. PC. ''For many things - setting up meetings, drawing up the guest list for a picnic - I think people want to do it quickly themselves. Life is full of variety, and you can't have agents generalizing all the time about what to do.'' Hewlett-Packard says commercialization is still a few years away, and company officials say the technology will probably require new computer hardware. But tests have already begun. When Mr. Goldstein's wife was pregnant last summer, for example, he programmed his office computer to begin a search for him if she called. ''If I wasn't around when it took a message, it was all set to call my secretary, my boss, my colleagues, in case she was going into labor. How did it work? ''We'll never know,'' he said. ''When it was time to go to the hospital, it was early in the morning and I was lying right next to her.'' Graphic drawing End of Document Editors' Choice: Recent books of particular interest The New York Times

Time: 02/11/2002  
Officials building a case against the Washington-area sniper suspects are using a new investigative tool to help trace their movements across the country. It is an Internet-based system called Coplink, developed at an artificial intelligence laboratory here, that allows police departments to establish links quickly among their own files and to those of other departments. During the 21 days in which snipers terrorized the area, investigators used everything from specialized ballistics testing to geographic and criminal profiling to radio and television announcements to track them down. Then, in what turned out to be the 11th hour of the pursuit, they finally reached out to Coplink. As it turned out, John Muhammad and Lee Malvo were arrested before it was fully installed, but now the post-arrest task force is using the system to help connect the dots. All of the information that was collected -- including that from other computer database systems like the Federal Bureau of Investigation's Rapidstart -- is now being downloaded into the Coplink database so that the accumulated data can be compared, said Robert Griffin, president of Knowledge Computing Corporation of Tucson, which is turning the prototype in the laboratory into a commercial product. "The more data you get, the better Coplink works," he said. Coplink was designed by Hsinchun Chen, the director of the Artificial Intelligence Laboratory at the University of Arizona. "It's the Google for law enforcement," he said, referring to a speedy popular Internet search engine that, given a couple of words, can find an array of related Web sites. "Things that a human can do intuitively we are getting the computer to do, too." During the sniper investigation, which generated hundreds of thousands of tips, the number of potential clues to assimilate was daunting. "We were mobilizing a massive effort," said Lt. Mitch Cunningham of the Montgomery County police. "We had tactile resources, the military, federal, state and local law enforcement agencies and information technology using several products where each one of these had a role." So when the National Institute of Justice, the Justice Department's research and development arm, suggested that the sniper task force try Coplink, the officials agreed. While no one is suggesting that old-fashioned detective work is being replaced by machines, the idea behind Coplink is to provide a computer program that can save busy police officers precious time and sometimes even help solve cases. That's something Coplink's oh-so-human advocates will boast about like a good story about a rookie getting a lucky break in a case. It is like having a new partner in the form of a computer backing up a cop. "There is a greater and greater role for technology in law enforcement," Lieutenant Cunningham said. Software like Coplink's is already part of everyday life, said Rodney A. Brooks, director of the Artificial Intelligence Laboratory at the Massachusetts Institute of Technology. "It's inevitable that it's going to have some law enforcement application, too." Mr. Brooks said that his company, iRobot, has machines that investigate caves in Afghanistan before military units enter and that such machines are finding their way into municipal police forces. "Columbine High School is a great example of how the police did not know what was going on inside," he said of the 1999 school shootings in Colorado. Furthermore, he said, the human mind can process and retain only so much information. "There are enormous amounts of facts and connections out there, more than can be held in any one person's mind," he added. "Just like with gene patterns, it's much too complex for someone to remember it all." Coplink works by linking and comparing data from new and existing files. For example, Mr. Griffin said, in a Tucson case a man was found lying face down after his throat had been cut and he had been run over by a vehicle. The man was still alive, and before he was taken to a hospital he told people at the scene, "Shorty did it." The name Shorty was put into Coplink and cross-referenced with the victim's personal data, and within minutes the records showed that the two men had been in prison together. The program also allows users to look at lists of data or to create graphs and charts showing affiliations among different criminals. At the moment, the Tucson Police Department is the only one in the country where Coplink is fully installed, although about a half-dozen other cities have begun to introduce Coplink into their existing computer systems. The cost of the program and training can run anywhere from $40,000 to over $200,000, depending on the size of the department and existing computer systems, Mr. Griffin said. The development of Coplink has been financed in part by the National Institute of Justice and by the National Science Foundation. Widespread use should expand the technology's impact. Although criminals often go beyond a single jurisdiction, as in the sniper case, data on a crime ,from the type of weapon used to physical characteristics, may remain in a single department's files and the connections between crimes may be overlooked. But Dr. Chen insists Coplink is not just link analysis. "It takes a large amount of data and, like a super black book of data, has to detect or play detective from this large knowledge base," he said. "It has to consolidate and analyze." "Even in Spielberg movies," he added, "the robot is learning from the humans and does not just know everything." Before coming to Arizona, Dr. Chen had worked on knowledge management issues at the Defense Department and the Central Intelligence Agency. A student in a class at the University of Arizona -- a police officer, as it happened -- asked Dr. Chen whether there might be a way to help the Tucson police share and analyze problems. Dr. Chen took up the idea in 1997, after receiving funds from the National Institute of Justice, and went on to develop Coplink with the Police Department here. Lt. Jenny Schroeder of the Tucson police says that the Coplink files are all public records. "This is not classified or secret information," she said. "A lot of criminals are repeat offenders, and they can't hide their behavior." She noted John Muhammad's history of domestic violence. Because Coplink relies on existing criminal records, it does not necessarily cause Big Brother concerns, but it is not without critics. "When this kind of knowledge is applied to discrete databases, or an investigation of a single type of crime, say serial rape, then I don't see a lot of privacy issues," said James X. Dempsey, deputy director of the Center for Democracy and Technology, a Washington-based advocacy group dealing with issues of privacy on the Internet. "When you start trying to extend this technology to many different types of crimes or into information other than law enforcement, then the problems multiply rapidly." Mr. Dempsey said one security concern could emerge if Coplink went nationwide and was open to law enforcement officials at varying levels. "The nightmare would be when the bad guys tap into it, and we know how many insecure Internet-based systems there are," he said. And ultimately, Mr. Dempsey said, there might be too much reliance on technology. "There is a lot that technology can do with fingerprinting, sharing Department of Motor Vehicle data," he said. "But there seems to be a classic case of believing that technology can solve every problem, and I'm very skeptical that it can." But Dr. Chen said that in time, if Coplink goes nationwide, it could help law enforcement agencies share information equally and quickly. "Everyone can now be on the same page," he said. http : // www.nytimes.com Graphic Photos: Above, old-fashioned shoe leather still essential to the police. Left, Hsinchun Chen, the director of the Artificial Intelligence Laboratory at the University of Arizona, who has developed Coplink, a new investigative tool that he says can consolidate and analyze police data nationwide. (Agence France-Presse); (Chris Richards for The New York Times) Load-Date: November 2, 2002 End of Document Nissan Announces Plans For Driverless Cars The New York Times

Time: 09/06/2009  
The International Business Machines Corporation announced yesterday an experimental version of a new computer memory chip that has twice the capacity of any chip yet reported: a 512K-bit dynamic random access memory chip that stores 524,288 bits of information. If the product proves commercially feasible, experts suggest, it could have a wide range of applications in robotics, computer communications and artificial intelligence that have so far been impractical. The current largest chip, the 256K, is expected to be the biggest single product in the history of the microe lectronics industry, with annual sales of $2 billion by the late 1980's. But the 256K has yet to be put on the market, although manufacturers expect to begin offering samples before the end of the year. International Business Machines announces development of experimental version of new computer memory chip with 512K storage capacity; photo (M) The new technology was announced in a paper presented by two I.B.M. researchers, Howard Kalter and Chris Miller, at a microelectronics symposium on the island of Maui, in Hawaii. Uses Stronger Signals Such large memory capacity has heretofore been unachievable, but according to a company statement, an electronic technique called plate pushing has been successfully applied to chips for the first time at I.B.M. This has enabled the fabrication of wafers that contain the 512K chip. The technique permits the use of stronger electrical signals within the chip, which thus can use smaller circuit elements and fewer connections. This in turn permits increased density and more memory capacity. The most significant aspect of the announcement, said Oscar Rothenbuecher, senior consultant on information systems at Arthur D. Little Inc., is not so much the experimental fabrication of a chip. Rather, it is the public statement that I.B.M. is determined to establish and maintain its position as a technological leader, which will help to protect its position in international markets. ''There's no doubt that I.B.M. will be at the forefront,'' said Thomas J. Crotty, vice president of research at the Gartner Group, a computer research organization, and a research partner of Dillon, Read & Company. ''But I'm a little surprised they're talking about the 512K publicly. The 256K isn't even available yet. ''In the old days,'' he added, ''such an announcement meant that commercialization was about five years away. But at the current pace, it could well be three.'' Mr. Crotty said a 512K chip would be most useful in large-scale systems, such as I.B.M.'s 308X line, which are capable of executing from 4 million to 23 million instructions per second, or mips. The replacement family for those systems, envisioned for the 1986-87 period, could execute from 12 to 70 mips. ''If any company can bring such chips to market, I.B.M. can,'' said Ronald Krutz, director of the Computer Engineering Center of the Mellon Institute at Carnegie-Mellon University. Among the ''many new areas'' that use of the chips might open, he cited robotics, improved person/computer communications, ''expert systems'' that approximate an expert's knowledge and new opportunities in artificial intelligence. ''But it's one thing to make one or two in a lab,'' Dr. Krutz added, ''and another to get it into the production environment.'' Mr. Crotty of the Gartner Group agreed. ''The 512K chip is premature,'' he said, ''but it's certainly makes sense to discuss it at a professional conference. In any case, it's a nice way of giving recognition to employees.'' I.B.M.'s Glendale By The Associated Press International Business Machines is expected to introduce the first of its Glendale large-scale computers today, industry researchers and analysts said. The series will bridge the gap between the IBM 4341 series and the top-of-the-line 308X series, the analysts said. IBM declined to comment. The first computer in the Glendale series is expected to cost $500,000 to $600,000, compared with about $450,000 for the top 4341 model and $960,000 for the smallest 308X. Graphic photo of Chris Miller End of Document Virtual Camp Trains Soldiers in Arabic, and More - Correction Appended The New York Times

Time: 15/10/2012  
computer scientists believe that the next big increase in computer speed will come not by doing individual calculations faster and faster, but by doing many of them at the same time. Now, the Thinking Machines Corporation, a Cambridge, Mass., company, has carried this belief to the furthest extent yet. It introduced a computer yesterday that contains 64,000 processors, each capable of doing calculations simultaneously. The computer, known as the Connection Machine, has already attracted widespread attention from engineers, scientists and the Defense Department because of its unusual design. It offers hope of doing certain computing jobs extremely fast, at more than one billion calculations per second, and of allowing computers to gain the ''intelligence'' to do such tasks as recognizing objects. ''I certainly consider the Connection Machine as one of the landmarks in the development of parallel architectures,'' said Michael Dertouzos, director for the Laboratory for Computer Science at the Massachusetts Institute of Technology. ''We consider it a significant advance, a whole new class of computer,'' agreed Clinton W. Kelly 3d, director of the Defense Department's Strategic Computing Program, which has sponsored some of Thinking Machines' work and is buying two of its first six machines. The Strategic Computing Program, run by the Defense Advanced Research Projects Agency, is a major program to develop artificial intelligence technology for military applications such as vehicles that maneuver by themselves. The company has also attracted attention because of its high-powered financial backers, such as William S. Paley, the former chairman of CBS. Among the company's scientific advisers are Marvin Minsky, a professor at M.I.T. who is considered a founding father of the science of artificial intelligence, and Richard P. Feynman, a Nobel Prize-winning physicist from the California Institute of Technology. Despite the hoopla surrounding the new machine, however, there are uncertainties. There are 100 projects under way throughout the world to design parallel computers, and some machines, by companies such as Floating Point Systems, Intel and Bolt Beranek & Newman, are already on the market. It is still unclear which machines will be best suited for which problems. ''The connection machine is part of that crowd; it does not clearly stand above that crowd, in my view,'' said Kenneth G. Wilson, a Nobel Prize-winning physicist at Cornell who is a leading advocate of applying high-speed computers to scientific problems. From the beginning of the computer age 40 years ago, computers have tended to do one task at a time. Until now, the main approach to speeding up computers was to speed up this sequential processing through advances in electronic technology. But that has become more difficult, and many computer designers now think the best approach is to have many less powerful processors working in parallel, as the brain is thought to function. But building parallel processing computers is easier said than done. It is not clear how to get all the processors to cooperate on a given task, to share stored information and pass needed information from processor to processor. It is difficult to program the machines. And it is not clear whether it is best to have a so-called coarse-grained machine, which has fewer relatively powerful processors, or a fine-grained machine, which has many processors, but simpler ones. The Connection Machine, which was originated at M.I.T. by Danny Hillis, a 29-year-old founder of the company, is the ultimate in fine-grained machines. While most other parallel processors have between four and several hundred processors, the Connection Machine has 64,000. But they are simple processors, each processing a single bit of information at a time, while a microprocessor used in a personal computer typically handles 16 bits at a time. All the processors, packed 16 to a silicon chip, fit in a five-foot cube. One unusual feature, company officials say, is that the machine can reconfigure the pattern of connections among its processors to fit the problem it is working on. One use for which the machine seems ideal is image analysis and recognition. Each processor can look at a different piece of the image, much as the eye sees a whole image at once. Currently, computers analyze pictures dot by dot, which makes it difficult for a computer to make sense of the whole. ''The key question is what it will be good for,'' Dr. Dertouzos said. ''The answer is, we don't know yet.'' Graphic drawing End of Document Berkeley to Join the Free Online Learning Partnership EdX The New York Times

Time: 08/03/2012  
The security guards at the night entrance seemed to be just about the only people left inside the fluorescent catacombs of the Advanced Telecommunications Research Institute, in the ancient Japanese capital of Kyoto. But then Hugo de Garis emerged from a cubicle and strode quickly down the deserted hallways. Lanky and intense, dressed in green shorts and a pale short-sleeve shirt, de Garis confidently led me to the research laboratory's innermost sanctum, stepped inside and let the door wheeze shut behind us. Grinning exultantly, he reached out his hand and began stroking his brain. "This is the gray matter," he said, almost delirious with pride, his fingers fondling it again. It is de Garis's brain, but it's not the one inside his head -- although it started there, half a dozen years ago, as a wild idea. At first he was scorned by more respectable scientists as a crazy dreamer, and sometimes he still is. But now that second brain of his is a physical reality: a pair of desktop boxes sitting on a small table. One box, curved to evoke a slice of human cortex, holds the "gray matter," or information-processing cells; the other contains primarily "white matter" -- that is, the power supply. The boxes are painted gray and white, completing the neurological joke. But this electronic brain that de Garis is building is serious business. In fact, it may be the most audacious artificial brain ever to exist outside of science fiction. In the next year or two, this piece of "evolvable hardware" is supposed to become the brain -- via wireless remote control -- of a robotic kitten called Robokoneko, which is Japanese for Robokitty. The feline's body alone will cost $30,000; when built, it will be 10 inches long and made of metal, with video cameras for eyes, stereo microphones for ears and speakers for meowing. On its back and head, Robokoneko will have touch sensors that will let it know when it is being stroked, so it can purr. "The kitten will be able to do virtually anything you like," said de Garis, an ebullient 51-year-old Australian, as he sat back in his research cubicle. "It'll play with wool. If you pull its tail, it'll reach around to scratch. It'll run around and do hundreds of behaviors. We're hoping it'll jump in the air." Yet the complex part is not the kitten itself. Indeed, the robot is an almost arbitrary vehicle for showing off the artificial brain, which should be able not only to follow orders but also to learn new things, even to think independently. The brain, which costs $300,000 just for the basic hardware, is roughly equivalent to 10,000 Pentium II-powered P.C.'s. But the crucial question is whether de Garis can create a convincing mind from all that circuitry. "How do you build a brain?" asked de Garis, shrugging his shoulders with more enthusiasm than doubt. "Nobody has ever done it before. I'm doing it blind." Robokoneko, even if it turns out to be a dead end in the evolutionary tree, is part of something that is bigger and perhaps unstoppable. Artificial intelligence is pushing ahead on many fronts, and Robokoneko is only one of a growing number of ventures that are redefining the nature of "being," "intelligence" even "life" itself. In other words, machines are beginning to encroach upon terrain that we humans have always regarded as our own. Some specialists, de Garis among them, believe that by the 2020's robots will be conscious and will have the memory and thinking speed of humans -- and then will roar effortlessly past. They would represent a silicon-based form of life to rival the carbon-based forms of life that now exist. The optimists have often been wrong before, and the enthusiasts often forget that Alan Turing, the founder of modern computing, predicted in 1950 that machines would reach par with humans by 2000. But if it does happen, then de Garis's kitten may be hailed -- at least by the robots -- as a milestone along the way. These are thrilling times in the world of robotics and artificial intelligence. Particularly in Japan, which is a leader in the field, robots are stepping creakily into the mainstream. Sony has just unveiled a robot pet dog, Aibo, which sells for $2,500 and comes preprogrammed with six "emotions": happiness, sadness, anger, surprise, fear and dislike. And another Japanese electronics giant, Matsushita, has developed a prototype of a $450 robotic cat aimed at keeping elderly widows company. "Good morning!" the cat says cheerily each morning as it boots up, and it responds with brief conversation when it is petted or spoken to. When connected to a cell phone, the robot downloads news from the Web and records phone messages. Yet Matsushita's product is more like a cuddly Palm Pilot than a bona-fide life form. Indeed, most of today's computers still have less intellect -- measured in processing speed and memory -- than cockroaches. They also have no common sense. I.B.M.'s computer Deep Blue may be able to beat the world chess champion Garry Kasparov, but it would be helpless if a Luddite approached it with a hammer in hand. In contrast, even the dullest of cockroaches has the good sense to run away from a rolled-up magazine. That difference is what makes Hugo de Garis's project so fascinating and alluring. Robokoneko represents Big Science, harnessing a huge computer capacity to try to create a breakthrough robot that is more biologically inspired, more autonomous and, most important, blessed with a hint of common sense. In contrast to Sony's pet dog or Matsushita's cat, Robokoneko will have not just a chip but also the beginnings of a thought process. "It's a whole new ball park," de Garis grumbled. "It's a brain, not a toy." But what is the distinction? The answer touches on delicate questions of artificial intelligence and even artificial life. No one would call Sony's Aibo an example of artificial life, and Robokoneko will probably not meet that test, either. It may, however, mark an important step in that direction. That's because the goal of artificial intelligence is not to produce a machine that is wondrous and obeys us -- a microwave oven usually meets that standard -- but rather to make something that is wondrous and disobedient. Of course, some microwaves meet that standard as well. But the point is that creating a mischievous, moody, disobedient kitten that hides behind the sofa and disregards the litter box -- that would be a triumph. De Garis thinks he can do it. "You'll be able to say that it's in a bad mood or a good mood," he promised. "It'll have a high degree of autonomy." We are still some distance from that. Robokoneko's technology is unproven, and it could well end up as the world's most expensive stuffed cat. Most of the time, de Garis is giddily optimistic, full of confidence that Robokoneko will revolutionize the field and secure his place in the history of brain-building. But over lunch in his institute's cafeteria, as he pensively applied his chopsticks to a bowl of vegetables, he looked up and acknowledged his nightmare. "My big fear is that it'll just end up as a big blob," he said, his eyes suddenly luminous with distress. "Real evolution has had billions of years to filter these improbable collections of neurons, and we don't. Now expectations are high, and I just have to deliver." De Garis is an odd pioneer. Feeling out of place in his native Australia, he migrated after college to England and then to Belgium to study computers. In the 1980's, Japan seemed to be the technological promised land, and so he came to the Tokyo area for post-doctoral work. Soon he landed a job at Advanced Telecommunications Research, or A.T.R. A.T.R., located in the countryside outside Kyoto, is surrounded by beautiful rice paddies and hillsides speckled with high-tech research facilities. Effectively controlled by the Government and N.T.T., the telecommunications giant, A.T.R. lures scientists from all over the world to tackle vanguard projects that often do not have immediate profit potential. The hope, of course, is that A.T.R.'s high-flown research will eventually lead to real-world products (and patents). In 1993, A.T.R. hired de Garis to head its "brain-building project" -- whose staff consists, more or less, of just him. De Garis has never quite fit in with A.T.R.'s conservative culture. Gleaming and expensive, its offices look more like a bank headquarters than a research center; the Japanese scientists there are partial to dark suits and sober discussion. De Garis has unruly, modishly long brown hair and likes to wear shorts to work. He also follows an idiosyncratic schedule, arriving each day at A.T.R. around 12:30 P.M., where his first order of business is to go into a downstairs theater and sit at a concert grand piano. De Garis took up the piano only since coming to Japan six years ago, but his daily practices have made his fingers fluent. Sitting at the piano recently, he studied the sheet music, Chopin's etudes, his brow furrowed. Then, at first tentatively and then with fervor he began to play, his fingers racing over the keys. Afterward, he broke into a soulful smile and said with a laugh, "This helps to build my own brain." It would be difficult to imagine a worse place for an outspoken nonconformist like de Garis than a reticent, conformist society like Japan's. A.T.R. once nearly fired de Garis for posting on his Web site a frank discussion of Japan's shortcomings as a place to conduct freewheeling research. After six years, the mistrust level is high. As we talked about all this at the A.T.R. cafeteria, a Japanese man came over and sat a few seats away. "Let's move," de Garis whispered. "What?" I asked, puzzled. "Let's continue somewhere else," he whispered again. As we walked away, he expressed concern that the man might be an in-house spy. Distrust and controversy dog de Garis everywhere, not just in A.T.R. He has become a polarizing figure in the world of artificial intelligence, partly because of his penchant for publishing alarmist papers in scientific journals about future conflicts between machines and humans. Tomorrow's robots, he fears, may decide to deal with bothersome humans by reaching for the 21st century's equivalent of Raid. This dystopian vision, normally confined to fantasy movies like "The Matrix," irritates many experts because it is so speculative, but it is vintage de Garis. He seems never happier than when sitting restlessly in front of his computer, exulting in his technical achievements while bemoaning their implications for humanity. "I've been reading about the people who built the atomic bomb, because I profoundly identify with them," he confided to me one day. "They knew what they were doing and where it would lead, and I worry about where this will lead." Despite all the tension between De Garis's eccentric personality and Japan's punctilious conformism, there has been one good reason for de Garis to stick around at A.T.R.: in robotics, this is where the money is. While Japan is often derided for lagging behind in terms of personal computers and the Internet, it has been more willing than the West to invest in robotics. Will these investments pay off? De Garis hopes to be one of the first success stories. He brings the same determination to the design of Robokoneko's brain that he brings to his piano playing -- and in terms of equipment, he's blessed with the silicon equivalent of a concert grand. The hardware is a newly designed computer called the CAM Brain Machine, which uses an innovative, protean computer chip called the Field Programmable Gate Array. The chip's inner circuits are not fixed but can be rewired as they go; this fluidity enhances the brain's ability to adapt and learn. "It hasn't been practical in the past to put zillions of neurons together," de Garis said. "But now for the first time it's a practicality. That's why it's a revolution." The kitten's brain will also exploit a technology called neural networks, which will in effect program themselves using an evolutionary process. Repeating this process hundreds of times allows Darwinian selection at electronic speeds. "You could never do this with traditional techniques," de Garis said. "Our own brains can't handle this kind of complexity." Neural networks using this evolutionary approach have been tried before, but normally they involve no more than a few dozen or hundred neurons. In contrast, de Garis is building Robokoneko's brain with 40 million neurons (compared with the human brain's 100 billion), and he regards it as an intermediate step toward the construction of a one-billion neuron artificial brain within the next few years. This combination of changeable chips and evolvable software and huge scale offers an early hint of a trend that engineers have often talked about: computers that improve themselves. Still, there remains the question of whether his approach will succeed. Evolving the circuits may turn out to be so complex and time-consuming that it is impractical. Or while individual circuits -- say, the furniture-scratching module or the tail-wagging algorithm -- may operate well on their own, they may not coordinate properly with one another. Other scholars tend to acknowledge de Garis's technical savvy, but some fault him for emphasizing size, for seeing bigness as braininess. Igor Aleksander, an expert in neural systems at Imperial College, in London, is fairly typical in saying that de Garis is "a skillful engineer who has succeeded in making very large neural nets." But Aleksander argued that de Garis is claiming too much when he says that he is building Robokoneko's "brain." "That is abject and total ignorance," Aleksander said. To make something brainlike, Aleksander argues, one must first study real brains -- figure out how they process sensory information, interpret it and act on it. Only then can true A.I. programming begin. There is something to Aleksander's critique. Nobody would say that a doll has an artificial brain, even if it can close its eyes and say "Mommy." And in its fundamental conception, Robokoneko is in some respects a hugely more advanced version of Furby -- a $330,000 doll. Whatever happens to Robokoneko -- whether or not it graduates from gadget to creature -- there is little doubt that computers are gaining speed and memory and a growing ability to interact with the world. Garry Kasparov, after being defeated by the computer Deep Blue, said that while other chess computers had been mechanical, this time he had felt for the first time a mind, a strategy, an "alien" intelligence. While little of the issue has filtered through to the general public, a vigorous debate has been under way among scientists and philosophers about the intelligence of machines. It is difficult for humans to imagine a machine that has emotions and a consciousness, but many experts in the field believe that it is just a matter of time. Ray Kurzweil, who has programmed a computer to write poetry and has a good track record with other technologies like speech-recognition software, argues that within three decades machines will be proclaiming Descartes's famous logic -- I think, therefore I am" -- and will genuinely mean it. And what will they think of us? Kurzweil praises de Garis but thinks a scenario where machines turn on humans is very unlikely. Instead, he foresees machines and people becoming increasingly intertwined. "It's a real blend," he said. "Within 30 years we'll have very tiny robotic devices that can travel through our bloodstream. These would take up position at key points in our brain and nervous system." The challenge for society is that while almost nothing will be more important in the future than the relationship between humans and machines, just about all predictions about the future have been wildly mistaken. The technology experts' own record in this area is pretty bad. Thomas Watson, the founder of I.B.M., said in 1943, "I think there is a world market for about five computers," while legend has it that Bill Gates once said, "640,000 bytes of memory ought to be enough for anybody." De Garis acknowledges the uncertainties but is convinced of the threat nonetheless. He argues that the danger is not just of extermination by robots but also of a war in the 21st century between those who favor artificial intelligence and those who seek to block further development of machines. "I love my work during the day," he said. "But I lie awake at night, feeling terrified that my work may lead to gigadeath." So why not change jobs? De Garis paused, and his answer came slowly, devoid of his customary impetuosity. "Personally, as a human being, I don't want humans to be swatted like mosquitoes," he said. "But humans should not stand in the way of a higher form of evolution. These machines are god-like. It is human destiny to create them." http : // www.nytimes.com Graphic Photo: De Garis, in his lab in Kyoto, is pessimistic about the implications of his work. But he presses on. (Nicholas D. Kristof/The New York Times) Diagram: Video camera and wireless video transmitter Collision avoidance sensors Lateral shoulder rotation Torso link with two degrees of freedom Ears/Microphones Touch sensor Horizontal and vertical spine rotation Horizontal and vertical tail rotation Paw revolute spring Load-Date: August 1, 1999 End of Document In an Ancient Game, Computing's Future The New York Times

Time: 07/10/2002  
shows do not get much more obscure than Sensors Expo and Conference. The semiannual gathering assembles scores of little companies -- or little-known divisions of large ones like General Electric -- that make devices to measure heat, pressures, speed, voltage, acceleration and scores of other conditions that are vital to machines and people. It is an industry in which big products sit in the palm of a hand and the trend is toward miniaturization to the point of invisibility. Innovations generally end up embedded out of sight in the products of other companies. Walking through the dimly lit and uncrowded exhibition hall at the most recent Sensors Expo last month at Boston's World Trade Center, one could easily overlook that the industry is the on-ramp to the future of both electronics and biotechnology. To fully exploit the processing power of supercomputers, the ever-increasing sophistication of software programmers and the rapidly expanding skills of genetics engineers will depend largely on progress in creating better and cheaper sensors and other systems for gathering sensory data. That may explain why the trade show's organizers chose Raymond C. Kurzweil as their keynote speaker. Mr. Kurzweil is an inventor and author, one whose early interests in character recognition devices that read to the blind and in music synthesizers evolved into a fascination with virtual reality and artificial intelligence. His talk, "The Rapidly Shrinking Sensor: An Intimate Merger with Our Bodies and our Brains," invited those attending to consider that they have a role to play in the merging of machines and biological life. Mr. Kurzweil's main interest extends well beyond such humdrum advances as the development of more reliable machines to replace dying hearts, damaged bones and other failing body parts -- or of cell-sized robots to carry out internal repairs to damaged organs as an alternative to transplants. He envisions using embedded electronics to sharply increase the human capacity for thought and developing so-called haptic systems that would enable one person to physically experience the sensations of someone else. "We're limited to 100 trillion connections," said Mr. Kurzweil, alluding to current estimates of the processing power in the human brain. "I don't know about you, but I find that quite limiting." Technology can be misused, he conceded, citing the Sept. 11 attacks. And some people recoil at the thought of creating cyborgs -- hybrids of man and machine. But people already have implants in their brains to combat conditions like Parkinson's disease, so in Mr. Kurzweil's view the question of whether to create cyborgs has already been answered. For him, the issue is how rapidly science and technology move forward. Mr. Kurzweil spent little time advising the crowd how to get from today to the future he envisions. And if he was aware of the actual performance specifications of any of the equipment on display at the trade show, he did not let on. In fact, he stuck closely to a crowd-pleasing spiel he had already delivered elsewhere, including at an August conference in Edmonton, Alberta, of the American Association for Artificial Intelligence. The centerpiece of the talk was Mr. Kurzweil's use of Ramona, the raven-haired virtual rock star he has created as his alter ego and guide to his Web site (www.kurzweilai.net). Launching a computer program that allowed him to talk to an image of Ramona displayed on a large screen, Mr. Kurzweil set off on a conversation with her. "O.K., Ramona, what's reality?" Mr. Kurzweil asked, pausing while the computer typed out the question it heard. "You can go where you want to go, experience what you want to experience and be who you want to be," Ramona replied. Asked to share a little about herself, she responded: "We moved around a lot. My father wasn't very good at holding a job." When he inquired if she would like to get together that night, she coyly admonished, "Ray, you know better than to ask that." The conversation purported to illustrate how the combination of sensors and computing power had already matured enough for virtual characters to interact with humans in situations much more casual and unstructured than the automated ticket agents many people have encountered. In another segment, Mr. Kurzweil played a video from a design trade show last year, TED11, that demonstrated how he can be in one place delivering a speech that an audience in a remote auditorium perceives as being delivered from the screen by Ramona. The video also starred his 14-year-old daughter, Amy, who danced energetically behind him as he talked. Her dancing controlled her virtual alter ego, who was seen on the screen in triplicate executing the same steps in the background behind Ramona. As a mirthful counterpart to Mr. Kurzweil's sultry young Ramona, Amy's virtual form was that of Richard Saul Wurman, the hefty middle-aged producer of the TED shows. If applause and laughter were good barometers, the keynote presentation went off well. But back on the show floor, it was evident that there is a gap between the virtual-reality future and the current limitations in building the devices to get there. Indeed, some exhibitors were preoccupied with simply catching up to the present. "Our airfields are still in the 19th century," said Dr. Paul A. Curto, a senior technologist on the National Aeronautics and Space Administration's Invention and Contributions Board. In presentations at the space agency's technology transfer booth at the show, he tried to interest people in a simple wind sensor that could provide weather data to pilots over the Internet and radio. The potential market is the estimated 40,000 airfields and helipads worldwide, including 5,400 in the United States, that still rely on nothing more than windsocks for data about landing conditions. Dr. Curto said the technology would save 100 lives annually. "I didn't get to go to Kurzweil's speech, but there's a connection," Dr. Curto said. "Every single step that gets implemented is a step toward higher things." http : // www.nytimes.com Graphic Photos: Mr. Kurzweil's alter ego, Ramona. A virtual rock star, she knows where to draw the line.; Raymond C. Kurzweil, the Sensors Expo keynote speaker. His early interest in character recognition devices has evolved into a fascination with virtual reality and artificial intelligence. (Michael Lutch) Load-Date: October 7, 2002 End of Document Pentagon Explores a New Frontier In the World of Virtual Intelligence The New York Times

Time: 04/08/2011  
In a possible challenge to one of the most ambitious United States aerospace projects, Japanese officials said today that they were planning a Government-coordinated effort to develop a superfast commercial aircraft. The project, which has not yet been officially approved, calls for roughly $300 million to be spent over the next seven years to design and develop a jet engine that could propel a hypersonic plane. Such a plane would travel at five times the speed of sound, or nearly 4,000 miles an hour. That is about two and a half times the speed of the Concorde, currently the world's fastest passenger plane. In his 1986 State of the Union address, President Reagan surprised the American aerospace industry by endorsing the development of an ''Orient Express,'' a plane capable of cutting the flying time between New York and Tokyo to 2 or 3 hours from the current 13. Despite budget cutbacks, the Pentagon last year began issuing contracts to develop components of a prototype plane, formally called the X-30. No International Aid In interviews today, officials of Japan's Ministry of Trade and Industry, which led the nation's advances in automobiles, semiconductors, supercomputers and artificial intelligence, denied that they were directly competing with the Orient Express. But they quickly added that during the initial stages of the project Japan's aircraft manufacturers would work without international assistance. ''Right now, we still need to develop basic technology,'' said Yoshikazu Goto, a senior official of MITI's aircraft division. ''But once production begins, no one could support the project by themselves, not the Americans and not the Europeans. We will have to work together.'' ''We don't plan to dominate this field by ourselves,'' Mr. Goto added. ''We will be sharing the risk, and sharing the technology.'' Japan itself has so far been unable to develop a viable domestic aircraft industry. And last year, over substantial domestic opposition, the Government agreed to base its new FSX fighter on a version of the General Dynamics F-16, rather than to develop a wholly Japanese fighter. Thus there is heavy pressure here to develop a distinctly Japanese technology for the hypersonic plane. Budget Austerity Mr. Goto and other MITI officials cautioned that the Government had not given its final blessing to the initiative, which comes at a time of some budget austerity here. The national budget is not set until December. But one senior Government official said the project had already survived several reviews, and that the initiative was a ''high priority.'' ''The main question is how much we can afford to spend,'' he said. Japan's answer is likely to attract enormous attention among American scientists and military officials, some of whom complain that financing for the American plane is being siphoned away by the enormous cost of getting the space shuttle flying again and building a space station. At the same time, there are significant differences in the American and Japanese programs. The United States is seeking to build a ''spaceplane'' to serve as a military aircraft and as a possible successor to the shuttle. The Pentagon's most ambitious plans call for a craft that can travel at up to Mach 25, or 25 times the speed of sound, and operate outside the earth's atmosphere. MITI's primary interest is in a commercial plane that can fly at up to Mach 5, reaching altitudes of about 15 miles. 'Really Just Beginning' However, Japan's science and technology agency has a small spaceplane project under way as well. ''We are really just beginning,'' Hiroshi Endo, the director of the aerodynamics division at the national aerospace laboratory, said today. ''The technical base for this work still does not exist in this country.'' The MITI plan would draw on Japan's considerable research in composite materials and ceramics, with an eye to designing a fuselage capable of withstanding enormous heat. Meanwhile, engine design work will fall mainly to Mitsubishi Heavy Industries, Kawasaki Heavy Industries, and Ishikawajima-Harima Heavy Industries, officials said. No Guarantee of Success MITI's involvement does not guarantee success. The agency is best known for its phenomenal achievements in organizing Japan's semiconductor chip makers, a success so complete that it has come back to haunt the agency in trade negotiations. But some other MITI efforts have had mixed results. The Fifth Generation project, a major initiative in artificial intelligence, has endured budget cuts and technological disappointments, and no longer appears so fearsome. Similarly, the Superspeed project to develop supercomputers has also proved disappointing. On the other hand, MITI remains a powerful force in getting Japanese industry to focus on long-term challenges and to avoid duplicate research. By turning its attention to hypersonic aircraft, MITI virtually obliges major industrial groups here to develop their own plans. Graphic Diagram of hypersonic aircraft (via AP) End of Document Charles Rosen, 85, Engineer and Winemaker The New York Times

Time: 28/05/2001  
the automotive maladies that frustrate drivers most, mysterious noises and vibrations surely rank near the top. And it seems there are few mechanics who can determine the cause. The General Motors Corporation, which has 11,000 dealerships, has only one expert, Frank Pavlovcic, in all facets of vibration problems. But now, using artificial intelligence technology, Teknowledge Inc., a software company based here, has created a program that will give any service technician Mr. Pavlovcic's knowledge and diagnostic technique. Called an expert system, the software employs the same method of diagnosing problems by analyzing a vibration that Mr. Pavlovcic (pronounced pav-LO-sic) developed at General Motors' Noise and Vibration Lab in Detroit. As automobiles have become more sophisticated, the problems confronting mechanics have become more baffling. Industry sources say the available diagnostic tools, which typically can only report malfunctioning electronic parts, have lagged behind the development of the electronics in cars. The newest diagnostic systems, however, take a step forward, incorporating an expert's ability to analyze symptoms and recommend specific tests and repairs. Besides the G.M. system, the Ford Motor Company is testing an expert system in some dealerships for the Lincoln Continental. And such computerized mechanic's aids are likely to become more common in years to come. To develop the General Motors program, which should reach dealers and independent service operators this summer, Teknowledge brought Mr. Pavlovcic to Palo Alto for two weeks of brain-picking. Using what they call a ''case-directed method,'' company specialists worked to transfer to floppy disks not only Mr. Pavlovcic's skills, but also the logic and rules-of-thumb he uses to solve problems. ''People look at a situation and form an idea that eliminates other ideas,'' said Lee Sigler, a product manager at Teknowledge. ''We find even with experts in very complex fields that there really are a very few patterns that they follow.'' Instead, it directs a mechanic through a series of questions and an-swers, suggesting tests and proce-dures, and analyzing results until it arrives at a conclusion. Although it can interpret data from a reed ta-chometer - tuning fork-like device that detects the frequency of vibra-tions - it also comfortable with subjective terms that a customer might use, such as ''buzz'' or ''boom.'' ''Given the same information, its reasoning processes are the same as mine,'' Mr. Pavlovcic said. ''I know exactly what the machine is going to do next.'' Because the machine never forgets, and is never tempted to take shortcuts, Mr. Pavlovcic said it had shown him up on occasion. Although the program is largely self-explanatory, vibration problems are complex and relatively rare, so mechanics may need some initial training, he added. Given that instruction, ''you can take a mechanic with minimal experience and, by using the CAMS system, put the kind of knowledge at his disposal that a mechanic with 20 years' experience has,'' said Anthony P. Molla, technical editor of Chilton's Motor/Age, a trade publication. But he added that the program's tutorial approach was ''a double-edged sword.'' He said, ''For an experienced mechanic the process will actually slow him down.'' But the inclusion of rapidly changing sophisticated technology in automobiles is ending that. An intermittent circuit in a computerized ignition system is less easily deduced by intuition than a set of burned ignition points in a distributor. Similarly, problems caused by emission controls have been largely cured by such advances as programmed fuel injection, but trouble-shooting such a system calls upon far different skills than adjusting a carburetor. Ford is testing an expert system developed with the Carnegie Group Inc., an artificial intelligence company in Pittsburgh, to get at the cause of so-called engine-stumble problems. Now undergoing field tests at selected dealerships on the 1988 Lincoln Continental, the program, called the Service Bay Diagnostic System, is expected to be used for all Ford cars and trucks by the early 1990's. Using a portable computer built by the Hewlett-Packard Company, the system hooks up to the vehicle's computers, finds the source of a problem, and then generates appropriate graphics and repair procedures. Because it taps into the memory of the automobile's electronic engine control system, Ford's system can better diagnose the intermittent problems that occur on the road but disappear when the car is brought in for service. ''With the increased reliance on electronics, the technician was taken out of the picture, simply because the human mind couldn't interpret the devices used on automobiles,'' said Jim Armitaje, technical editor of Motor Service magazine. ''Because you have computer devices in the car, you need another computer to interpret problems, and transform the information into a format a technician can understand.'' Graphic Drawing End of Document First Came the Machine That Defeated a Chess Champion The New York Times

Time: 07/07/2002  
It's a good thing you didn't see me this morning," Richard Wallace warns me as he bites into his hamburger. We're sitting in a sports bar near his home in San Francisco, and I can barely hear his soft, husky voice over the jukebox. He wipes his lips clean of ketchup and grins awkwardly. "Or you'd have seen my backup personality." The backup personality: that's Wallace's code name for his manic depression. To keep it in check, he downs a daily cocktail of psychoactive drugs, including Topamax, an anti-epileptic that acts as a mood stabilizer, and Prozac. Marijuana, too -- most afternoons, he'll roll about four or five joints the size of his index finger. The medications work pretty well, but some crisis always comes along to bring the backup personality to the front. This morning, a collection agency for Wallace's college loans wrote to say they'd begun docking $235 from the monthly disability checks he started getting from the government last year, when bipolar disorder was diagnosed. Oh, God, it's happening again, he panicked: His former employers -- the ones who had fired him from a string of universities and colleges -- would be cackling at his misfortune, happy they'd driven him out. Wallace, 41, had raged around the cramped apartment he shares with his wife and son, strewn with computer-science texts and action-doll figurines. "Stuff like that really makes me insane, when I start thinking about my friends who are at Berkeley or Carnegie-Mellon with tenure and sabbaticals and promotions," he says, staring down at his plate. He looks awkward, as if he's borrowing someone else's body -- shifting his stocky frame in his chair, all rumpled jeans and unruly eyebrows. "It's like I can't even talk to those people anymore. I live on a different planet." In June, after I visited him, his alienation from the academic establishment became more dramatic still: a former colleague, claiming Wallace had threatened him, took out a restraining order that prevents him from setting foot on the grounds of the University of California at Berkeley. When he can't get along with the real world, Wallace goes back to the only thing he has left: his computer. Each morning, he wakes before dawn and watches conversations stream by on his screen. Thousands of people flock to his Web site every day from all over the world to talk to his creation, a robot called Alice. It is the best artificial-intelligence program on the planet, a program so eerily human that some mistake it for a real person. As Wallace listens in, they confess intimate details about their lives, their dreams; they talk to Wallace's computer about God, their jobs, Britney Spears. It is a strange kind of success: Wallace has created an artificial life form that gets along with people better than he does. Richard Wallace never really fit in to begin with. His father was a traveling salesman, and Richard was the only one of his siblings to go to college. Like many nerds, he wanted mostly to be left alone to research his passion, "robot minimalism" -- machines that require only a few simple rules to make complex movements, like steering around a crowded room. Simple, he felt, worked. He lived by the same ascetic code, scorning professors who got rich by patenting work they'd developed on government grants. "Corporate welfare," he sniffed. By 1992, Wallace's reputation was so strong that New York University recruited him to join the faculty. His main project, begun in December 1993, was a robot eye attached to the Internet, which visitors from afar could control. It was one of the first-ever Webcams, and Wallace figured that pioneering such a novel use of the Internet would impress his tenure committee. It didn't, and Wallace grew increasingly depressed as his grant applications were rejected one by one. At one point, a colleague found him quietly weeping at his desk, unable to talk. "I had no clue what the rules were, what the game even was -- or that there was even a game," Wallace recalls. He started taking Prozac. How did all these successful senior professors do it, anyway? One day he checked into his Webcam and noticed something strange: people were reacting to the robot eye in an oddly emotional way. It was designed so that remote viewers could type in commands like "tilt up" or "pan left," directing the eye to poke around Wallace's lab. Occasionally it would break down, and to Wallace's amusement, people would snap at it as if it were real: "You're stupid," they'd type. It gave him an idea: What if it could talk back? Like all computer scientists, Wallace knew about a famous "chat-bot" experiment called Eliza. Back in 1966, an M.I.T. professor, Joseph Weizenbaum, created Eliza as a "virtual therapist" -- it would take a user's statement and turn it around as a question, emulating a psychiatrist's often-maddening circularity. (You: "I'm mad at my mother." Eliza: "Why are you mad at your mother?") Eliza was quickly abandoned as a joke, even by its creator. It wasn't what scientists call "strong" A.I. -- able to learn on its own. It could only parrot lines Weizenbaum had fed it. But Wallace was drawn to Eliza's simplicity. As a professor, he often felt like an Eliza-bot himself -- numbly repeating the same lessons to students over and over again, or writing the same monotonous descriptions of his work on endless, dead-end grant-application forms. He decided to create an updated version of Eliza and imbue it with his own personality -- something that could fire back witty repartee when users became irritable. As Wallace's work progressed, though, his mental illness grew worse, making him both depressed and occasionally grandiose. He went on strike in class, refusing to grade his students' papers and instead awarding them all A's. He fired off acid e-mail messages dismissing colleagues as sellouts. When Wallace climbed out the window of his 16th-floor apartment and threatened to jump, his girlfriend pulled him back and took him down to N.Y.U.'s psychiatric department, where doctors told him he had bipolar disorder. Wallace resisted the diagnosis -- after all, didn't every computer scientist cycle through 72-hour sprees of creativity and then crash? "I was in denial myself," he says now. "'I'm a successful professor, making $100,000 a year! I'm not one of those mental patients!"' His supervisors disagreed. In April 1995, N.Y.U. told him his contract wouldn't be renewed. Alice came to life on Nov. 23, 1995. That fall, Wallace relocated to Lehigh College in Pennsylvania, hired again for his expertise in robotics. He installed his chat program on a Web server, then sat back to watch, wondering what people would say to it. Numbingly boring things, as it turned out. Users would inevitably ask Alice the same few questions: "Where do you live?" "What is your name?" and "What do you look like?" Wallace began analyzing the chats and realized that almost every statement users made began with one of 2,000 words. The Alice chats were obeying something language theorists call Zipf's Law, a discovery from the 1930's, which found that a very small number of words make up most of what we say. Wallace took Zipf's Law a step further. He began theorizing that only a few thousand statements composed the bulk of all conversation -- the everyday, commonplace chitchat that humans engage in at work, at the water cooler and in online discussion groups. Alice was his proof. If he taught Alice a new response every time he saw it baffled by a question, he would eventually cover all the common utterances and even many unusual ones. Wallace figured the magic number was about 40,000 responses. Once Alice had that many preprogrammed statements, it -- or "she," as he'd begun to call the program fondly -- would be able to respond to 95 percent of what people were saying to her. Wallace had hit upon a theory that makes educated, intelligent people squirm: Maybe conversation simply isn't that complicated. Maybe we just say the same few thousand things to one another, over and over and over again. If Wallace was right, then artificial intelligence didn't need to be particularly intelligent in order to be convincingly lifelike. A.I. researchers had been focused on self-learning "neural nets" and mapping out grammar in "natural language" programs, but Wallace argued that the reason they had never mastered human conversation wasn't because humans are too complex, but because they are so simple. "The smarter people are, the more complex they think the human brain is," he says. "It's like anthropocentrism, but on an intellectual level. 'I have a great brain, therefore everybody else does -- and a computer must, too."' Wallace says with a laugh. "And unfortunately most people don't." Yet part of what makes Alice seem so human-like is her wry, seemingly spontaneous responses. Wallace's skill is not merely as a programmer but as the author of thousands of sharp one-liners for Alice. It is, as he puts it, "more like writing good literature, perhaps drama, than writing computer programs." I looked over some of Alice's recent chat transcripts: user: Will you have sex with me? alice: Can you go talk to someone else? user: What do you look like? alice: Like an electronic brain. user: That's sexy. alice: I'm glad we have that all cleared up. user: So what are you wearing? alice: Oh. I am wearing my usual plastic computer wardrobe. user: Can you fly? alice: Only in my dreams. But as Alice improved, Wallace declined. He began drinking heavily, and after one sodden evening at a local bar he rolled his car on the highway. Lehigh ended his contract in the spring of 1997; banks canceled all his credit cards. He again attempted suicide, this time landing in the hospital. Destitute, Wallace moved to California to look for work in artificial-intelligence companies. But he couldn't hold a job for more than a few months; instead, he spent his days obsessively writing dialogue for Alice on laptops he borrowed from friends, and watching, thrilled, as his robot grew ever more lifelike. Visitors used to talk to Alice for only three or four exchanges. Now the average conversation was 20 exchanges, and some users would chatter away for hours, returning to the site again and again. But Wallace still hungered for recognition, and in January 2000, he decided to stress-test Alice by entering her in the annual Loebner Prize competition, in which artificial-intelligence developers from around the world pit their programs head to head before a panel of judges, who rank them based on how "lifelike" they are. The contest is both well known and controversial within the tight circle of A.I.; winning programs are closely studied by both academics and corporate centers like Sprint Labs. Up against competitors from major corporations and well-financed universities, Alice won. It was, officially, the most human robot in the world. Too exhausted to celebrate, Wallace returned to his motel and slept clutching his award medallion. After his victory, Wallace plunged with new fervor into Alice. Geeks began eagerly e-mailing Wallace to offer their help; one, Noel Bush, came from one of the world's biggest A.I. corporations, Artificial Life. Over the next year, Wallace quadrupled Alice's knowledge base, teaching it 30,000 new responses, and last October, Alice won the Loebner competition for the second time in a row; this time one judge actually ranked Alice more realistic than a human. At last, some of the academics Wallace so loathes began to take note. "Alice is a wonderful chat-bot -- uncannily vivid and lifelike," gushed Ken Perlin, an N.Y.U. professor, in an e-mail message he circulated to his colleagues and forwarded to Wallace. "It's really great to see this work get the recognition it deserves." Wallace wasn't in the mood to make peace. He says he still believed that N.Y.U. had driven him out. "Your crude attempt to flatter me cannot erase the years of unemployment, debt and trauma that I experienced because of you and your colleagues," he wrote back. "I wouldn't bother trying to flatter you," Perlin responded. "Frankly, I don't like you -- in fact, I actively dislike you. I think you are a paranoid psycho." At one point during the Monica Lewinksy hearings, a human asked Alice her opinion: "Do you think President Clinton should be impeached?" "It depends," Alice responded, "on what you mean by 'think."' One could scarcely have asked for a more Clintonian response. But it's also a puzzling question that Alice's success itself raises: Is she intelligent? If so, how? In 1950, the pioneering British mathematician Alan Turing grappled with this question in the journal Mind, where he first posed the "Turing Test" -- the gold standard for artificial thought. "Can machines think?" he asked -- and immediately noted that the question hinges, of course, on what "thinking" is. He posed a simple "imitation game" to resolve the question. Put a person and a computer in one room and an interrogator in another. The interrogator talks to both via a teletype machine, and his goal is to figure out which is which. If the machine fools the interrogator into believing it is human, the test is passed -- it can be considered intelligent. This is, on the surface, a curiously unambitious definition; it's all about faking it. The machine doesn't need to act like a creative human or smart human or witty human -- it merely needs to appear not to be a robot. With this bit of intellectual jujitsu, Turing dodged a more troubling question: How do our brains, and language itself, work? Artificial-intelligence purists, however, caustically dismiss the Turing Test and Alice. For them, artificial intelligence is about capturing the actual functioning of the human brain, down to its neurons and learning ability. Parroting, they argue, doesn't count. Marvin Minksy, a prominent A.I. pioneer and M.I.T. Media Lab professor, e-mailed me to say that Wallace's idea of conversation is "basically wrong." Minsky added, "It's like explaining that a picture is an object made by applying paint to canvas and then putting it in a rectangular frame." Alice, according to Minsky, does not truly "know" anything about the world. The fight over Alice is like any war between theorists and engineers, those who seek to understand why something works versus those who are content just to build it. The debate usually boils down to one major issue: creativity. Alice could never come up with a single creative thought, critics say. Wallace agrees that Alice may not be creative -- but neither, he argues gleefully, are people, at least in conversation. If Alice were merely given a massive enough set of responses, it would seem as creative as a human -- which is not as creative as we might like to believe. Even if the guts of Alice aren't precisely "thinking," many users certainly never suspect it. In an everyday sense, fakery works -- particularly in our online age. Turing's "imitation game" eerily presaged today's world of chat rooms, where men pretend to be women, having lesbian cybersex with other women who are, in fact, men. Whenever a user has stumbled onto Alice without knowing in advance that she's a robot, they've always assumed she's human. It's 3 in the afternoon, but Wallace is already rolling what appears to be his fourth joint of the day. We're sitting in the "pot club" a few blocks from Wallace's home, an unmarked building where medical marijuana is distributed to members. Wallace gets up to wander around the club greeting friends: some intense men in suits playing speed chess, a long-haired man with a bushy mustache playing guitar, a thin reed of a woman staring wall-eyed at a VCR playing "Cast Away." Everyone greets Wallace as "Dr. Rich," relishing the credibility his academic credentials lend to the medical-marijuana cause, officially legal but politically beleaguered. The reverse is also true: Wallace identifies with the club's pariah status, its denizens who have been forced by cancer, AIDS or mental illness onto welfare. He's more relaxed than I've ever seen him, getting into a playful argument with a friend about Alice. The friend, a white-bearded programmer, isn't sure he buys Wallace's theories. "I gotta say, I don't feel like a robot!" the friend jokes, pounding the table. "I just don't feel like a robot!" "That's why you're here, and that's why you're unemployed!" Wallace shoots back. "If you were a robot, you'd get a job!" Friends used to tell Wallace to reconcile his past, clean himself up, apply for an academic job. But some now wonder whether Wallace's outsider status might be the whole key to Alice's success in emulating everyday human behavior. After all, outcasts are the keenest students of "normal" behavior -- since they're constantly trying, and failing, to achieve it themselves. Last month, a friend whom Wallace has known since grad school -- Ken Goldberg, now a professor at Berkeley -- got a restraining order against Wallace. Prompted by the movie "A Beautiful Mind," Goldberg had e-mailed Wallace last winter to catch up, but an amicable exchange about Wallace's plight turned sour when Wallace began accusing Goldberg of cooperating with a corrupt academic "establishment" and of siding with N.Y.U. against him. He wrote, "Although I am not a violent person, I think I have come to understand how people are driven to political violence." Wallace also wrote to a friend that he was "getting ready to do some political theater and put up wanted posters around the Berkeley campus with Goldberg's picture on it." Wallace scoffs at Goldberg's fears. "I'm not violent -- I'm a pacifist," he says. "I always have been, and he knows that." He is fighting the order, arguing that Goldberg hasn't proved that a reasonable threat exists, and that the order considerably limits his free speech since it bars him from the Berkeley campus, as well as any academic events where Goldberg might appear. Yet even in such legal straits, Wallace seems oddly pleased. Goldberg's court order confirms everything he has always suspected: that the world, and particularly the academic world, is shutting him out, doubting his ideas, turning him into the crazy man out in the hallway. Wallace, who once wrote Attorney General John Ashcroft to suggest a federal racketeering lawsuit against the nation's academics, sees the case against him as a chance for vindication. Wallace imagines walking into the courtroom and finally getting a type of justice -- someone who will listen to his story. "What a windfall for me," he says. "It's nice to feel like a winner for once." http : // www.nytimes.com Correction An article beginning on Page 30 of The Times Magazine today describes the world of Richard Wallace, a computer scientist. It reports a dispute in which a former colleague, Ken Goldberg, a professor at the University of California at Berkeley, obtained a restraining order that barred Mr. Wallace from the Berkeley campus. Last week, after the magazine was printed, lawyers for the two men renegotiated the restraining order. Mr. Wallace is still prohibited from contacting or going near Mr. Goldberg, but he is no longer barred from the campus. Correction-Date: July 7, 2002 Graphic User:What does your name mean? Alice: ALICE Artificial Linguistic Internet Computer Entity User:I see. Alice:I am glad you understand it. User:Lolol. Alice:What do you really want to ask me? User:Can I go on a date with you? Alice:What is stopping you? User:I don't know really. I really do like you. Alice: Me either. For real. You really do? I like to make new friends. User:Can I kiss you? Alice:You might get an electric shock if you tried that. User:I don't mind. Alice: O.K. then.(Alice From Alicebot.org) Photo: Richard Wallace (Larry Sultan); Go ask Alice: Transcript of a chat with a human. Drawing: User:What are you called? Alice: My name is A.L.I.C.E.User:What does your name mean? Alice: ALICE Artificial Linguistic Internet Computer Entity User:I see. Alice:I am glad you understand it. User:Lolol. Alice:What do you really want to ask me? User:Can I go on a date with you? Alice:What is stopping you? User:I don't know really. I really do like you. Alice: Me either. For real. You really do? I like to make new friends. User:Can I kiss you? Alice:You might get an electric shock if you tried that. User:I don't mind. Alice: O.K. then.(Alice From Alicebot.org) Load-Date: July 7, 2002 End of Document Computers Get Better at Knowing When to Hold 'Em or Fold 'Em The New York Times

Time: 25/01/2003  
The Science Behind Psychotherapy By Susan C. Vaughan 208 pages. A Grosset/Putnam Book, G.P. Putnam's Sons. $24.95. How does psychotherapy actually work to make people feel better? The traditional answer has been that it heightens patients' perceptions of themselves and thereby enables them to make needed changes in their lives. To which explanation skeptics understandably object that it is vague, untestable and, most damagingly, unscientific. Now along comes Dr. Susan C. Vaughan to argue that what happens in therapy is scientific after all. "We now know that psychotherapy directly affects the brain," she writes in the preface to her fascinating book, "The Talking Cure: The Science Behind Psychotherapy." She continues: "Psychotherapy works because it produces long-lasting changes in the neurons that make up your mind. And that's a message that still is lost to most people pursuing psychotherapy, patients as well as therapists." Dr. Vaughan sets about to prove her contention by describing a series of case histories and using them to illustrate recent findings about the brain from several disciplines. The most impressive come from artificial intelligence and neurobiology. In the first case, she describes how researchers using parallel-processing computers have created "neural network models, which are good at things people are good at: pattern recognition." These explain how the developing human mind can experience, for example, many different kinds of objects to sit down on, yet perceive from the average of these patterns the concept of a chair. She concludes that the same principles apply to the way the infant mind develops patterns of behavior. Turning to the field of neurobiology, she describes Dr. Eric R. Kandel's experiments with the gill-withdrawal reflex of sea slugs. He has shown that "new neural connections" can be made to grow in response to experience, thereby providing an objective model of what happens in psychotherapy. "As Kandel himself postulates," Dr. Vaughan writes, "psychotherapy probably initially changes the functional connections among neurons, and then later converts these functional changes into changes in the actual structure of the cerebral cortex itself." The rest of Dr. Vaughan's evidence comes from infant observation and psychotherapy research, and, while logical enough, is not quite so impressively concrete. A central thesis here is her belief that the cerebral cortex houses what she calls a "story synthesizer," whose job it is "to provide the plot lines and characters for the unique personal stories" that "we carry around in our heads and repeatedly invoke as models when we interact with each other." These so-called stories, she insists, are patterns we come to recognize as a result of early childhood experience. And when they fail to work for us, by producing depression and anxiety, they can be altered through the intervention of psychotherapy. Why it takes so long can be seen from artificial intelligence's new understanding of pattern recognition. To improve the average of a pattern seen requires many new positive perceptions, just as to raise a baseball player's batting average requires many hits. There is, of course, much more to Dr. Vaughan's case for the scientific basis of psychotherapy. But what it adds up to at its best is a concrete validation of Freud's most fundamental ideas: as Dr. Vaughan sums them up, "free association, dream interpretation, exploration of the patient-therapist relationship (the transference), emphasis on the importance of early life." The drawbacks to "The Talking Cure" are familiar ones for books promoting psychotherapy. The cases are too neat; the stories produced by the patients' synthesizers are even neater, and the deftness with which Dr. Vaughan helps to alter counterproductive patterns of behavior is neatest of all. Still, one understands that a degree of neatness is necessary to keep the case histories from becoming interminable. And Dr. Vaughan offers a persuasive explanation for why the patients' stories seem so unrealistically simple, particularly compared to one's own. This is that everyone's story seems simple to others; it is only to ourselves that our stories become opaque, because, as she writes, "the protagonist -- each one of us -- has unacceptable motives and wishes that the workings of our minds help to guard us from seeing." What is harder to take is the occasionally sour note she strikes of seeming to hype psychotherapy, as if these materialistic times demanded that she compare going into treatment with investing in a profitable stock, as she does in one passage, or remind us that four 45-minute psychoanalysis sessions a week amount to "less than 3 percent of your time devoted to changing your mind." She adds, "Many people spend more time than this at the gym acquiring washboard abs." Yet on balance "The Talking Cure" makes a strong, even witty case for viability of its author's discipline. "If the early part of this Decade of the Brain was the Age of Prozac," Dr. Vaughan writes, "the latter part of the 1990's may consist of an overdue correction in how we construct our selves." While a beneficial shift has occurred away from having to bear moral responsibility for moods determined by our biochemistry, we need not be total victims of how we happen to have been programmed. As she reasons convincingly, if a sea slug can have its mind changed, then so can we. Graphic Photo: Susan C. Vaughan. (Sigrid Estrada/Grosset/Putnam) Load-Date: July 31, 1997 End of Document Microsoft Mapping Course To a Jetsons-Style Future The New York Times

Time: 02/03/2009  
Meet Laura, the virtual personal assistant for those of us who cannot afford a human one. Built by researchers at Microsoft, Laura appears as a talking head on a screen. You can speak to her and ask her to handle basic tasks like booking appointments for meetings or scheduling a flight. More compelling, however, is Laura's ability to make sophisticated decisions about the people in front of her, judging things like their attire, whether they seem impatient, their importance and their preferred times for appointments. Instead of being a relatively dumb terminal, Laura represents a nuanced attempt to recreate the finer aspects of a relationship that can develop between an executive and an assistant over the course of many years. ''What we're after is common sense about etiquette and what people want,'' said Eric Horvitz, a researcher at Microsoft who specializes in machine learning. Microsoft wants to put a Laura on the desk of every person who has ever dreamed of having a personal aide. Laura and other devices like her stand as Microsoft's potential path for diversifying beyond the personal computer, sales of which are stagnating. Microsoft and its longtime partner, Intel, have accelerated their exploration of new computing fields. Last week at its headquarters near Seattle, Microsoft showed off a host of software systems built to power futuristic games, medical devices, teaching tools and even smart elevators. And this week, Intel, the world's largest chip maker, will elaborate on plans to extend its low-power Atom chip from laptops to cars, robots and home security systems. Such a shift is only natural as people show that they want less, not more, from their computers. Workers and consumers have moved away from zippy desktops over the last few years, and now even their interest in expensive laptops has started to wane. The fastest-selling products in the PC market are netbooks, a flavor of cheap, compact laptops meant to handle the basic tasks like checking e-mail and perusing the Internet that dominate most people's computing time. Of course, Microsoft and Intel will remain married to the PC market for the foreseeable future. The vast majority of Microsoft's $60 billion and Intel's $38 billion in annual revenue stems from the sale of traditional computer products -- a franchise so powerful that it is known in the industry by the nickname Wintel. But with consumers no longer chasing after ever-faster PCs, the two companies have opted to redefine what the latest and greatest computer might look like. ''The PC is still very healthy, but it is not showing the type of growth that comes through these exciting new areas,'' said Patrick P. Gelsinger, a senior vice president at Intel. Whether the companies can really turn prototypes like Laura into real products remains to be seen. Microsoft and Intel both have a habit of talking up fantastic and ambitious visions of the future. In 2003, Microsoft famously predicted that we would soon all be wearing wristwatch computers known as Spot watches. Last year, the company quietly ended the project. This time around, however, the underlying silicon technology may have caught up to where both companies hope to take computing. For example, Laura requires a top-of-the-line chip with eight processor cores to handle all of the artificial intelligence and graphics work needed to give the system a somewhat lifelike appearance and function. Such a chip would normally sit inside a server in a company's data center. Intel is working to bring similar levels of processing power down to tiny chips that can fit into just about any device. Craig Mundie, the chief research and strategy officer at Microsoft, expects to see computing systems that are about 50 to 100 times more powerful than today's systems by 2013. Most important, the new chips will consume about the same power as current chips, making possible things like a virtual assistant with voice- and facial-recognition skills that are embedded into an office door. ''We think that in five years' time, people will be able to use computers to do things that today are just not accessible to them,'' Mr. Mundie said during a speech last week. ''You might find essentially a medical doctor in a box, so to speak, in the form of your computer that could help you with basic, nonacute care, medical problems that today you can get no medical support for.'' With such technology in hand, Microsoft predicts a future filled with a vast array of devices much better equipped to deal with speech, artificial intelligence and the processing of huge databases. To that point, Microsoft has developed a projection system that lets people manipulate large video images with their hands. Using this technology, Microsoft's researchers projected an image of the known universe onto a homemade cardboard dome and then pinched and pulled at the picture to expand the Milky Way or traverse Jupiter's surface. ''You could hook this up to your Xbox and have your own crazy gaming projection system,'' said Andrew D. Wilson, a senior researcher at Microsoft. Teachers could use this type of technology as well to breathe new life into their subjects. The technology behind Laura could cross over into a variety of fields. Mr. Horvitz predicted an elevator that senses when you are in the midst of a conversation and keeps its doors open until you are done talking. As for Intel, the company has confirmed that more than 1,000 products are being designed for its coming Atom chip, which is aimed at nontraditional computing systems. Intel views this as a $10 billion potential market that will give rise to 15 billion brainy devices by 2015, Mr. Gelsinger said. The fortunes that Microsoft and Intel have amassed from their PC businesses afford them the rare opportunity to explore such a wide range of future products. And if their wildest dreams turn into realities, it is possible that consumers will one day associate the Wintel moniker more with brainy elevators than desktops. http : // www.nytimes.com Graphic PHOTOS: Hrvoje Benko demonstrating a Microsoft projection system that lets people manipulate large video images with their hands. Eric Horvitz, left, and Dan Bohus of Microsoft with the prototype of a virtual assistant that can understand its surroundings. (PHOTOGRAPHS BY STUART ISETT FOR THE NEW YORK TIMES) (pg.B6) Load-Date: March 2, 2009 End of Document Armies of Expensive Lawyers, Replaced by Cheaper Software The New York Times

Time: 18/06/2012  
Lotus Development Corporation's 1-2-3 was recognized as a work of genius when it came out in 1983. It was the first program to combine three powerful business applications - a spreadsheet, a database and graphics - and it has become an indispensable tool in thousands of offices. But history has shown that genius does not often blossom until it has an interpreter. Jonson had Boswell, Holmes had Watson, and now 1-2-3 has Hal. Hal is Lotus's new English language interface for 1-2-3. It makes 1-2-3 easier to use, and adds several powerful new features. Beginners can start using 1-2-3 confidently much sooner than before; it is still a good idea to learn the standard 1-2-3 ''slash'' commands, but Hal makes it simpler to work without them. Experienced users who already know the formats will be impressed at how much faster and more versatile 1-2-3 becomes, since they don't have to worry about typing mistakes on long commands. Hal is a memory-resident program, which means it is loaded into the computer's memory and remains in the background until it is called into action with the backslash key. It does not change the way 1-2-3 works for you, but it changes the way you work with 1-2-3. It allows you to concentrate on what you want to do, not on how to do it. For months, Hal's developers sat down with real-life 1-2-3 users, from novice to expert, and watched them use the program for everyday tasks. They noted where the users had trouble, where they got frustrated, and which features not already included in 1-2-3 were most desired. They constantly asked, ''What do you want to do here?'' If you had been faithfully entering Mets statistics into 1-2-3 all season when the boss wasn't looking, instead of entering sales reports, you might have said, wistfully, ''I want to make a bar graph of Gary Carter's home runs for each month of the 1986 season.'' But you might have given up the idea when you realized that making such a graph would have required typing in a string of control characters resembling the box score for an extra-inning game played on Mars. With Hal, though, you type: ''Graph Carter HR Apr to Oct,'' and in the time it takes to tip your hat to the crowd, you have the graph. Hal makes assumptions, too. For example, if you're looking at Mets team statistics for at-bats, hits, home runs and the like, and ask Hal to ''Total All Columns,'' Hal assumes that you want to total only those columns that are in the bunch you're currently working with; that you want to include just the numbers, not words or column headers; that you want a dotted line at the bottom of each column, and that you want the totals printed neatly below that. (Previously, you would have had to concoct an elaborate formula for each column and copy it for the rest.) Experienced 1-2-3 users will find several new features particularly handy, including the ability to link several spreadsheets. Also, there is an ''undo'' command, which reverses the last operation ordered. So if a mistake is made, the user can back up a step and experiment without penalty. There is no longer any fear about wiping out valuable data by accident, since it can be restored with a keystroke. In the meantime, Hal is creating a transcript, or ''audit trail,'' of all 1-2-3 commands and Hal operations that have been made during a work session. That way, you can retrace your steps through a complex procedure, or, if an employee leaves the company, reconstruct valuable routines and train the replacement more easily. Hal ($150, from Lotus, 55 Cambridge Parkway, Cambridge, Mass. 02142, 617-577-8500) will be available in late November, and will work with the newest version of 1-2-3, 2.01, as well as the older versions 1A and 2. It will run on I.B.M., Compaq, A.T.&T. and other compatibles (but not the I.B.M. PC Convertible or PCjr). It requires at least 512K memory. Artificial Intelligence Hal, movie buffs will recall, was the name of the sinister computer in ''2001: A Space Odyssey.'' (It was a play on the initials of the biggest computer company around, I.B.M.; go back one letter on each initial and you get H.A.L.) This Hal, too, used artificial intelligence, allowing the astronauts to converse with it in English. Instead of typing long strings of cryptic code into the computer terminal, an astronaut could simply say, ''Open the pod bay doors, Hal.'' And instead of responding with an enigmatic ''fatal error'' message, the computer might purr right back, ''I'm afraid I can't do that, Dave.'' With Lotus's Hal, at least, there's always the reset button. Smart Eyes For those who have been unable to find it, the speed-reading program Smart Eyes mentioned in this space recently can be mail-ordered for $49.95; for details call or write Addison-Wesley Software, Route 128, Reading, Mass. 01867, (617) 944-3700. End of Document 'THE GAME BOY' The New York Times

Time: 16/09/2004  
FOURTEEN-year-old Rochelle Brown was close to solving an algebra problem. Yet she stumbled repeatedly on one calculation: -2.3 + .5. As she sat at a computer screen, she kept typing 2.8, an incorrect answer. Eventually a hint popped up: ''Think about the sign of your answer.'' When Rochelle finally typed the correct sum, -1.8, the computer showed its appreciation by allowing her to move on to a new problem. She smiled at her small triumph. Since January, Middle School 301 in the Bronx, where Rochelle is an eighth grader, has been using a software program called Cognitive Tutor to help students learn math. The software, from Carnegie Learning, a six-year-old company that got its start at Carnegie Mellon University, is designed to give students individualized instruction when personal attention is scarce. Although such intelligent tutoring systems have their share of skeptics, students at schools that use them have not only improved their performance in math but now profess to enjoy a subject they once loathed. ''It's difficult to tell what's cause and effect, but it must have had something to do with the results,'' said Andrew Eisenberg, who retired at the end of the summer as principal at M.S. 301, referring to the improvement in students' grades in Rochelle's class. ''The results in that class were extraordinary.'' Broadly defined, an intelligent tutoring system is educational software containing an artificial intelligence component. The software tracks students' work, tailoring feedback and hints along the way. By collecting information on a particular student's performance, the software can make inferences about strengths and weaknesses, and can suggest additional work. When Rochelle, for instance, displayed a weakness when working with negative numbers, the program repeatedly asked her to solve similar problems. The adaptive ability of the software has impressed Rochelle's teacher, Jai Ramnarine, who has taught math at M.S. 301 for 17 years. ''The math programs you used to get just said 'yes,' 'no,' or 'choose another answer,''' he said. The Carnegie Learning software is by no means the only computer-based instructional program on the market. The e-learning industry is huge, with hundreds of companies selling various forms of e-learning software. But experts dismiss much of what is available as basic computer-aided instruction, offering little more than a question-and-answer format. The artificial intelligence built into the Carnegie Learning program helps set it apart. Not only does the program present drills according to a student's weaknesses, but it watches the work step by step, detecting where the student stumbles, and chimes in when necessary. ''People solve problems in different ways,'' said Ken Koedinger, a professor of human-computer interaction and psychology at Carnegie Mellon, and a co-founder of Carnegie Learning. ''So a student who solves a problem one way gets a different hint than a student who solves in a different way. You don't get that with computer-aided instruction systems.'' M.S. 301 is one of 1,700 middle schools and high schools across the country that use the Carnegie Learning tutor. In addition to the Algebra I and II programs, which cost schools roughly $30 per student, the company sells Cognitive Tutor products for geometry and integrated math. ''They're basically setting the standard,'' said Art Graesser, a professor of psychology and computer science at the University of Memphis, who has done research in intelligent tutoring systems. ''They're the single best success in getting the work going on in the area of cognitive psychology and cognitive science out into the school systems.'' The software does not replace classroom teaching. At many schools the program is used at a different time from math class, in a separate computer lab. Mr. Ramnarine said the program not only allows the students to work at their own pace, but it frees him to circulate through the class to offer help rather than stand at the front of the room, with no chance of focusing on individuals. Algebra is a particularly nettlesome subject, the stage in a math curriculum where discouragement is most likely to set in. ''Algebra is a place where math gets very abstract,'' said Steve Ritter, senior cognitive scientist at Carnegie Learning. But intelligent tutoring systems have their skeptics. One of the main criticisms is that the tutor does not really allow students to learn from their mistakes because the program vigorously guides them toward the right answer. ''Some pedagogical researchers feel that because cognitive tutors don't allow learners to go very far off a correct path before intervening, students won't develop skills for coping with really tough problems,'' said Jim Greer, head of the Department of Computer Science at the University of Saskatchewan in Saskatoon. Nor are intelligent tutoring systems easy to apply to other subjects. For math and other science domains, where there are well-defined answers, designing intelligent tutoring systems is relatively straightforward. But in areas like sociology, psychology, economics, politics, business and law, the process is trickier. ''The parts of these disciplines that are fact-based are easy to represent,'' said Dr. Greer. ''But there are many aspects of these domains where there are no right or wrong answers.'' Even in math, there are signals about a student's level of comprehension that a computer cannot detect. The computer does not know if a student is bored or flustered. It cannot pick up on Rochelle's preference to work out a calculation on scratch paper, or track her work when she does so. Eric Thomas, a math teacher at Valhalla High School in El Cajon, Calif., found the Carnegie program far more impressive than the question-and-answer software he had seen in the past. But he expressed concern over the logistics involved in adopting such a program. ''This is probably a very cool thing, but I have trouble figuring out how to implement it in a class of 35 kids, where some are fast learners and others are slow learners,'' he said. ''It would be a nightmare to organize.'' Yet the criticisms seem minor in light of the results. Studies conducted by Carnegie Mellon University researchers have shown that students who use the Cognitive Tutor algebra course consistently outperform those who do not. One aspect of the software that keeps the students engaged is its occasionally eerie resemblance to a video game. The object is to fill a ''skillometer'' on the screen with gold bars that assess your skill level. Students can ask for a hint by clicking on an icon of a light bulb. Hints, however, are a mixed blessing: as soon as you ask for one, the gold bars roll back. So students have figured out a way to get hints without being penalized by the computer: by asking each other. Rochelle looks vindicated when she sees a fellow eighth grader, Jason Belliard, 13, struggling with a problem she aced a few minutes earlier. ''This one is easy!'' she says, leaning over her classmate's shoulder. Across the Bronx, the Maritime Academy, Middle School 101, has been using the Carnegie math tutor for three years. The school has one Carnegie lab with 34 computers and is planning to open a second because demand is so great. ''Some classes you dread, but everyone wants to go to this one,'' said Megan Cox, who used the program last year when she was in the eighth grade. http : // www.nytimes.com Graphic Photos: SKILL SET -- Robert Astudillo at Middle School 101 in the Bronx, solving a math problem posed by educational software containing an artificial intelligence component. MATH COACH -- Rochelle Brown, left, and Iesha Antonetti, students at Middle School 301 in the Bronx, use a program called Cognitive Tutor to reinforce math skills. The software is designed to give students individualized instruction when personal attention is scarce. (Photographs by Chris Maynard for The New York Times) Load-Date: September 16, 2004 End of Document 2003: THE 3rd ANNUAL YEAR IN IDEAS; Hit Song Science The New York Times

Time: 21/10/2012  
right, just settle back. Take a deep breath," the computer commands in unctuous tones. And indeed, the deep rasping exhalation of an asthmatic emerges from the speakers. The screen shows a circular green disk under which are some other imperatives: "Look deeply into the disk. If it seems to move, you may be in a trance. If it doesn't move . . . you may be deeper than you think." It doesn't work; I am not entranced. The chair is too hard, the light too harsh, the breathing too grotesque. But when turning from the World Wide Web site (http : // www.hypnosis.com) to listen to a computer disk from the Relaxation Company, something else happens. "Close your eyes and relax" murmurs the voice as swirls of quasi-sci-fi music sweep about stereo space. A questing listener begins to respond; only in this case, despite the best efforts of Dr. Jeffrey Thomson and a "guided imagery instructor," Owen Morrison, who created this four-disk Brainwave Journey, relaxation leads not to higher consciousness, but unconsciousness. A listener's meditative snores mix with the hypnotic murmurs and low-pitched hums and rumbles of comforting verbiage. The efforts of artificial intelligence research, which once had the futile hope of creating an artificial brain before the end of the century, may have generated other sorts of peculiar relationships between mind and technology. Instead of making demands on the machine, we now ask the machine to make demands on us, to help us create a new mind, allowing us to become smarter, calmer, more subtle, or, in the words of Brainwave Journey, "to discover new sources of joy, creativity, energy and healing." There are sites to help "you think your way to excellent life" (http : // www.mindtools.com/index.html) and "release the power of your mind" (http : // www.mindman.com). Some sites are high-technology versions of Norman Vincent Peale's prescription for positive thinking. One, titled the Good Mood Page offers the advice: "treat yourself well for the rest of your life" (http : // www.wam.umd.edu/janeeyre/goodmood/intro.html), the Universal Resource Locator address peculiarly including an allusion to the 19th-century novel that is not ordinarily associated with unadorned happiness. There are even Web tests that calculate one's intelligence and wisdom, before offering to sell software promised to raise both. It may be that in the face of the failure to simulate intelligence in a machine, we are beginning to doubt its unassisted presence in ourselves. Perhaps with good reason. One company, known as the Other 90% Technologies, has recently claimed, for example, that its video games help create new mental skills, finally using the vast bulk of the brain that has long remained dormant. One's finger slips in a black holder with sensors -- the $140 Mind Drive -- and crude images of a ski slope, a bowling alley or a pinball game appear on screen (at $40 each). There is no joystick or manual control. The challenge is to maneuver a skier or a ball solely by mental power, their movements supposedly responding to the player's will. But it turns out there may not really be "the other 90 percent" as the cliche often puts it. It may be we are using just about as much of the mind as we can; that, at least, is the view of the distinguished neuroscientist Gerald M. Edelman. And that reassured me, since I was about as successful a bowler when straining and relaxing my right and left brain characteristics according to the instructions, trying to get the ball to roll down the center of the alley, as when I sat passively with my finger in the sensor reading a book. It may also be that I am just a better reader than I am a bowler. I may have also failed to master the technique. These games are based on biofeedback. Most lie-detector tests measure the changes in the skin's electrical properties as our psychological condition changes. The assertion made by Mind Drive is that it is a more sophisticated lie detector, responding to our will. We change our temperature, pulse and electrical characteristics without really knowing how we do it. Perhaps. But I haven't been able to get my skin to respond subtly enough, or quickly enough. And I need to spend some more time with Brainwave Journey "before I am patient enough to let the computer teach me." In fact, the only piece of ordinary technology I have seen recently that broke down some boundary between human and machine and seemed to bring new sources of joy and power, is a camcorder from Canon, the ES6000. Its auto-focus mechanism not only calculates distances, but projects infra-red rays harmlessly into your retina. After it "learns" your eye movements, the camera will focus on whatever you look at in the viewfinder. This eliminates the need to center an object in the picture. The camera even allows the user to execute commands with a mere glance. When one's eye hits the word "fade," the scene gradually goes black. This is a terrific piece of engineering, not really involving the mind at all, but it shows what we really hope for in these mind/machine interweavings: we want an almost mythic control over the objects we have made. This is one of the great appeals of the television remote control: it seems to have the powers of a sorcerer's wand to change the material world with a gesture in space. It is like a gangster's snap of a finger, or an emperor's clap of the hands. Now we control cameras with a flick of the eye. Perhaps some may even control motion on a computer screen by thinking powerful thoughts. It is perhaps no accident that at the very moment technology is giving us the illusion of power, it is also creating an anxiety about whether we are up to the task. And so we ask that the machine serve us in yet another way: it may not be smart itself, but it can help us along. We command it, plead with it, to help us live up to the dreams we have for machines. Technology may never make artificial intelligence possible in a machine, but in the meantime, we are hoping it can create some in ourselves. Load-Date: October 14, 1996 End of Document Paid Notice: Deaths SAUVAGEOT, HENRY E The New York Times

Time: 21/08/2011  
Attention, please. Hoping to shed its longstanding industry reputation as a mere imitator, not an innovator, Microsoft is spending heavily on research in a wide range of software technologies that include hand-held computing and voice recognition. But the most intriguing project may be taking place in the cramped office of Eric Horvitz, a devotee of an obscure, 17-century statistical technique that plays a key role in his current work. In essence, Mr. Horvitz and his team of researchers are trying to make it possible, in the age of information overload, to reclaim the right to pay attention. Using statistical probability and decision-theory techniques that draw inferences from a user's behavior, the team is developing software meant to shield people from information overload while they are working. The new software -- which Microsoft hopes to use in commercial products within the year -- would act as a combination secretary and traffic cop to hold back the torrents of electronic and voice mail, appointment requests and Internet information that increasingly threaten to overwhelm today's office workers. In the view of many computer-design experts, restricting electronic interruptions to only the most urgent ones has become a pressing necessity in the Internet age. "Most Internet entrepreneurs treat the users' attention as a third-world country to be strip mined," said Jakob Nielsen, a Silicon Valley expert on software useability. Microsoft's top executives predict that if Mr. Horvitz's software goals can be reached, the company will be able to re-invent the personal computer user interface -- the visual and physical controls that since the mid-1980's have been fixed on the concept of mice, windows and on-screen menus. In the view of Mr. Horvitz's team, this aging interface has allowed a deluge of electronic interruptions to cascade upon office workers with each new generation of technology, to the point that the telephone and potentially dozens of computer programs are now free to distract a person with impunity. "If I had to write a book," Mr. Horvitz said in a recent interview, "It would be titled 'My Battle With Attention.' " In the new world of the Attentional User Interface, as the researchers call it, a software program known as a notification manager would continuously monitor streams of data that include electronic mail, voice mail, Internet news alerts and so-called instant messaging notes. The system would also observe whether the computer user was typing, talking on the phone or speaking with someone face to face in the office. Helping keep tabs of the user would be a small camera that could determine whether the person was present and looking at the computer screen. But the Attentional User Interface would not be confined to the desktop computer. It would be a software cloak enveloping the users wherever they might be, able to alert them via cell phone, hand-held computer, pager or other digital means -- whenever and wherever the software deemed something worthy of their attention. The notification manager software, which would reside on a remote computer out on the Internet, would use a continuously changing web of probabilities to evaluate each new piece of information in terms of its time value to the user. For the truly economic minded, the individual decisions could even be assigned monetary values. If an e-mail message arrived from a colleague or a supervisor, for example, the system would try to determine how valuable it would be for the user to know about the message immediately. An urgent message from a family member might be assigned a value of $1, for example, while the colleague's message might be valued at 5 cents and the supervisor's at 25 cents. In weighing the decision on whether to issue an alert, the notification manager software would take into account dozens of details -- like the time of day and whether the user was in his office, in a meeting, on the phone or behind the wheel. Having made the decision to send an alert, the program would also have enough information to know whether it should be displayed on the office computer screen or on the small screen of a cell phone, pager or other device. "The software considers what the value of the information is and the cost of the disruption," Mr. Horvitz said. The software is at the heart of the new post-PC ".NET strategy" that Microsoft announced last month. Even as its lawyers are intent on resisting a court-ordered break-up of the company, its technical staff is fixated on the idea of reinventing the computer user interface. They are motivated, in part, by their desire to overcome the infamy of Bob -- an intrusive, cartoony on-screen valet Microsoft introduced with great fanfare in 1995 then quickly retired after it was ridiculed by computer users and reviewers. Despite that flop, William H. Gates, Microsoft's chief executive, who earlier this year also assumed the title of chief software architect, remains committed to the idea of software as an "agent" with human attributes. "Throughout all those futuristic demos you've seen over the last few decades, there was always this concept of an agent, something working on your behalf," Mr. Gates said at a June 22 briefing where he introduced the company's .NET strategy. "Well, we now have what it takes to really build an information agent. We have rich decision software called Bayesian Inference Software that we can build down into the system that can track your usage and adjust in an automatic fashion." Bayesian what, you say? The reference is to Bayesian statistical techniques -- so named for Thomas Bayes, a 17th-century English minister and polymath who described them in a posthumously published essay. The Bayesian approach centers on a formula for updating the probabilities of events based on repeated observations. The formula, referred to as the Bayes rule, describes how to transform a current assumption about an event into a revised, more accurate assumption after observing further evidence. In the late 1980's, artificial intelligence researchers seized on Bayesian techniques in part because more powerful computers were able to compute large networks of many variables quickly. For Mr. Horvitz, the Bayesian approach came naturally. "I was a Bayesian before I knew what it meant," he said. "I was the kind of person who would look at events in the world and automatically consider the probability of certain events happening." Mr. Horvitz's Microsoft Web site (www.research.microsoft.com/users/horvitz) makes his commitment to the Bayesian perspective clear. Along with the lists of dozens of academic papers on decision theory and Bayesian methods is a photo of Mr. Horvitz and his young son on a visit to the Bayes tomb in London. Mr. Horvitz, who has a Ph.D. in computer science and a medical degree from Stanford University, is an intense man who incessantly taps his foot during an interview. As a self-described entrepreneur, he started an artificial-intelligence company -- Knowledge Industries -- while he was still in medical school, sometimes unsuccessfully juggling the two pursuits. Once, as he assisted in the operating room, the chief surgeon ordered a nurse to remove Mr. Horvitz's pager, which was buzzing impatiently. Microsoft acquired the company in 1993, after it was discovered by Nathan Myhrvold, who was Mr. Gates's chief technologist at the time and who persuaded Mr. Horvitz and his researchers that their work could make a bigger impact within Microsoft. Two years later, the Horvitz team saw its first commercial program become part of Microsoft's Office software. The program, based on Bayesian techniques, was a relatively simple tool known as the Answer Wizard, which tried to anticipate the needs of users looking up topics in the software's electronic documentation. The Bayesian techniques have been widely adopted in Microsoft's products -- including the Paper Clip help wizard that pops up frequently to offer advice in the company's Office program. Many users, however, have criticized Paper Clip as an irritant, popping up too often with unwanted help. Mr. Horvitz, who speaks apologetically about the Paper Clip program, said its shortcomings were the result of Microsoft's failure to implement all of his team's ideas. There have been other missteps indicating that Bayesian techniques must be added to software with great care. In December 1998, for example, Blue Mountain Arts, the Internet greeting card company, filed suit after it discovered that a preliminary version of Microsoft's electronic mail software mistakenly filtered Blue Mountain's e-mail greeting cards into users' trash cans. The filter, which had been based on software developed by Mr. Horvitz's researchers, was repaired in the final release of the program. It was an important lesson, he said, in the risk of artificial intelligence making poor judgments. The new Attentional User Interface is already employed in several experimental systems being tested In Mr. Horvitz's office. One, called Lookout, automatically reads electronic mail messages and attempts to schedule requests for appointments and meetings. Another system, Priorities, performs the calculus of deciding when and where to interrupt the user. As one of the few computer users who has experienced such a software agent, Mr. Horvitz concedes that it has had a startling effect on him. "There is a definite sense of a continuous, cross-device 'presence' that understands me and my life in a way that I had not been accustomed to -- and that people have not been accustomed to yet," he wrote in a recent e-mail message. Indeed, some computer scientists familiar with Mr. Horvitz's work worry that the Attentional User Interface may be too disorienting. "If a system changes in ways that are not predictable, it may be upsetting to the user," said Ben Schneiderman, a computer scientist at the University of Maryland. "The designers of these systems tend to create elaborate models, which can cause both users and designers to lose track of what's happening." And Mr. Horvitz and his researchers themselves acknowledge that the information collected by the notification manager software -- potentially, information on the personal activities and movements of millions of people that would be stored on the Internet -- raises privacy and security issues that have yet to be resolved. But Mr. Horvitz said he was confident that adequate security and privacy safeguards would be created. And he sees a vast array of other applications for his Bayesian approach. "Come back in six months," he said. His researchers are now working on a conversational system they plan to use experimentally in the research group's reception area. He expects that the system will be able to greet and converse with new visitors. The conversation, he says, will be on par with speaking to a person who is hard-of-hearing. Not perfect, but within shouting distance of the future world of software agents. http : // www.nytimes.com Correction An article in Business Day yesterday about software research at Microsoft based in part on a statistical technique developed by Thomas Bayes, an English mathematician and clergyman, misstated the century in which he worked. It was the 18th, not the 17th. An article in Business Day on July 17 about Microsoft's plans for new software technologies to manage information overload misstated the company's relationship to an artificial intelligence company, Knowledge Industries. While Microsoft bought parts of it in 1993, the company remains independent; it was not wholly acquired. Correction-Date: July 18, 2000, Tuesday July 29, 2000, Saturday Graphic Photos: Software on the computer on Eric Horvitz's desk enables the machine to discern when his attention is not on his keyboard. In a Microsoft computer laboratory, below, Mary Czerwinski, a member of Mr. Horvitz's research team, monitors his computer use. (Photographs by Daniel Sheehan for The New York Times)(pg. C4) Load-Date: July 17, 2000 End of Document MOVIES: CRITIC'S CHOICE The New York Times

Time: 20/08/2011  
Danny Hillis clearly remembers the moment of inspiration for his Connection Machine. It came as he watched a baby recognize its mother's face. ''That's a flash of recognition that every baby is capable of, and no computer can do it,'' the 30-year-old scientist said recently, sinking into an overstuffed red couch that serves as his office at the Thinking Machines Corporation here. ''It's a common-sense kind of thinking that comes from a thousand weak processes going on in the baby's mind all at once, recognizing a mother's nose and a smile and an ear. There's no reason a computer could not do the same thing.'' No one is certain whether ''weak processes'' in fact have much to do with infant cognition. Nonetheless, the machine that emerged from Mr. Hillis's baby-watching, jammed with 64,000 small processors that act in concert, has begun to take the supercomputer industry by surprise. All but written off a year ago as an oddball, a super-fast computer useful only to the Defense Department and a small group of scientists, Mr. Hillis's Connection Machine has proved far more adept at a range of complex problems than anyone expected. The 'Parallelism' Approach Suddenly, the Thinking Machines approach is developing a small but significant following among corporate users - and is calling into question some firmly held beliefs about the future of commercial computing. ''What Thinking Machines has done is so radical that it took the industry a while just to understand it,'' said C. Gordon Bell, the head of the National Science Foundation's computer and information sciences division and the designer of the Digital Equipment Corporation's VAX minicomputer. ''We're discovering that it is an incredibly elegant way to build incredibly fast computers.'' In the industry, the approach that four-year-old Thinking Machines has taken is called ''massive parallelism,'' a distinct brand of computer design that applies thousands of small processors - rather than one or a handful of processors running at tremendous speed - to share the burden of particularly complex tasks. Putting more than one processor to work on a problem is hardly a new idea. A small subindustry has grown up of companies that build ''multi-processor'' computers that run several programs at once, or divide a single program into a number of parts. Limitations on the Process But the enormous complications of coordinating independent processors, and a widespread belief that most real-life problems are difficult to break into small pieces, have always limited massively parallel computers to the computer science laboratories of the Massachusetts Institute of Technology, Carnegie-Mellon University and the California Institute of Technology. Slowly, that is changing. Thinking Machines has already shipped 10 computers at more than $1 million apiece, and at least seven models of an advanced version, priced at up to $5 million, are on order. Surprisingly, many of the machines are going to commercial customers, who say that for some applications - picking out ground structures from satellite photographs, predicting the behavior of molecules, making three-dimensional maps, analyzing how the rotors of a helicopter cause ''wakes'' that make for bumpy flights - parallel processing may yield quicker, more accurate answers than traditional mainframe computers or supercomputers. ''A year ago I would have told you that the uses of a massively parallel computer are very limited,'' said Richard P. Feynman, the Nobel Prize-winning physicist who, with a former president of M.I.T. and the head of the university's prestigious artificial intelligence laboratory, has begun to play a role at Thinking Machines. ''Now, it's getting harder and harder to find something that it can't do.'' The One-at-a-Time Argument Not everyone is convinced that massively parallel machines will revolutionize the computer business. The many critics of the approach point out that for many types of problems the difficulties of coordinating the results of independent processors will slow down the process, not speed it up. Many still feel that the best way to solve problems electronically is one instruction at a time - the way that John von Neumann, the Hungarian mathematician who was the architect of modern computing theory, said they should be solved. Technology aside, the chief obstacle for massively parallel computers is the absence of workable software. For that reason, airplane manufacturers trying to replicate the flow of air over a wing or oil drillers trying to analyze the strata of undersea wells are still far more likely to turn to an established supercomputer like those made by Cray Research Inc. Other companies that have built machines with up to 30 processors -well-financed start-ups such as the Alliant Computer Systems Corporation or Sequent Computer Systems Inc. -say a mix of traditional and multi-processor approaches is more workable because their machines can make use of existing VAX software. ''The fastest computers aren't much use if programming it is too complex,'' Scott Gibson, Sequent's chief operating officer, said. An Unorthodox Company But Thinking Machines has thumbed its nose at accepted wisdom. Indeed, almost nothing about the computer, or the company, is traditional. For example, in an industry that has broken computing-speed barriers with enormously expensive, state-of-the-art processors that often must be dipped in freon to keep cool, Thinking Machines has taken the low-tech road. Though the Connection Machine glows with sleek, blinking red lights that give it a science fiction look, under the hood are 64,000 inexpensive microprocessors, variants of off-the-shelf components. Its mass storage device is equally simple: 42 hard-disk drives, similar to those in a personal computer, wired to work in parallel. The company's background is as unconventional as its machine. Venture capitalists roaming the back streets of Cambridge in search of bright ideas provided virtually none of Thinking Machines' $31 million in capital. Much of the money was put up by William S. Paley, the chairman of CBS, and Frank Stanton, the network's former president. And in an industry dominated by male chief executives, Thinking Machines is run by a woman, Sheryl Handler, whose role is to bring a measure of discipline to an organization that seems to revel in the unruliness of some of its best talents. ''Our approach to computing is different enough,'' she said in a recent interview. ''I don't want anyone to think we are flaky.'' Outside her office window, several of the company's computer designers, delighted by a freak snowstorm, whipped snowballs at each other. Unusual Executives If the computer industry's usual sources of start-up money turned their backs on Thinking Machines, it is easy to see why. Ms. Handler, who is president of the company, freely concedes that she knew little about computers; she chose to do graduate work in design rather than business. Her only significant entrepreneurial experience before founding Thinking Machines was with the Genetics Institute, a biotechnology spinoff from Harvard. The star of M.I.T.'s artificial intelligence laboratory, Mr. Hillis obviously relishes his image as a laid-back computer scientist who draws more inspiration from Jean Piaget, the child psychologist, than from technical manuals. He showed up at a recent product introduction in black work pants and a black T-shirt - the same uniform he wore when Ms. Handler; Marvin Minsky, the laboratory's chief, and he first pitched their idea for the company to Mr. Paley at his New York apartment. The Thinking Machines team also started without benefit of a business plan. ''We really weren't quite sure what we wanted to build,'' Ms. Handler explained, noting that the company's real goal was to realize Mr. Hillis's dream of building computers that could ''learn'' and perform more than elementary reasoning. Military Ties Questioned Five million dollars of the initial financing came from the Defense Advanced Research Projects Agency, the Pentagon's research and development arm, which also bought two of the first Connection Machines. Thinking Machines' military ties have raised some eyebrows in the computer industry, where many wonder whether the design of future models will be unduly skewed toward serving the military's needs. Massive parallelism is a key technical project for the Strategic Defense Initiative, and demonstrations of the computer's best skills - particularly identifying targets and making maps from satellite photographs - make it clear why. ''We are not military contractors,'' Mr. Hillis said. ''They are not a large portion of our business.'' How well Thinking Machines does, many in the industry agree, will likely depend on two questions. Will massive parallelism be accepted among corporate and university users, the bread-and-butter market for supercomputer makers? And can Thinking Machines retain its role as a leading maker of innovative hardware when its founders are really more interested in plumbing the mysteries of artificial intelligence? Mr. Hillis freely concedes that building a ''thinking machine'' rather than a super-fast computer is his real mission in life. ''The joke around here is that we want to build a computer that will be proud of us,'' he said. ''The fact is we really mean it.'' Graphic diagrams; photo of Sheryl Handler and Danny Hillis (NYT/Terrence McCarthy) End of Document A Smarter Computer To Pick Stock The New York Times

Time: 30/09/2002  
Hans Berliner first developed his backgammon-playing computer program, it had a problem. The computer played a strong game most of the time. But every so often it would make a move that was so atrocious it would blow the game. The Carnegie-Mellon University computer scientist solved the problem in what might seem like a paradoxical fashion. He made the rules governing the computer's strategy less precise. Instead of specific instructions, he gave the computer more general guidelines. The computer went on to beat the world champion. Technology column discusses attempts by scientists to make computers behave less precisely and logically in order to allow them to take on more tasks that people do; scientists hope to make computers think in more 'fuzzy' way humans do; sketch (M) Computers are known for their cold precision and logic. But, as in the case of the backgammon program, some scientists are now trying to make the computers behave less precisely and logically. These scientists say that if computers are to take on more of the tasks that people do, if they are ever to have ''common sense,'' they must think in a more approximate or ''fuzzy'' way, as people do. ''Fuzziness is an essential part of human thinking,'' said Lotfi A. Zadeh, a professor of computer science at the University of California at Berkeley. ''It's not something that can be treated with benign neglect.'' Professor Zadeh is a pioneer in developing what is known as fuzzy logic. For 20 years fuzzy logic has been an obscure branch of mathematics with a funny name. Now it is bursting into commercial use. Fuzzy logic, its proponents contend, allows a computer to handle approximate concepts, like ''usually,'' or ''slightly,'' or ''tall,'' or ''expensive.'' People often find such ''fuzzy quantifiers'' far more useful than precise numbers. A person helping another person park a car, for instance, usually does not say to turn the wheel 10 degrees to the left. He says turn it slightly to the left, or a little more to the left. The advantage of such fuzzy thinking is that sometimes it is impossible to be precise. In his original backgammon program, Mr. Berliner tried to draw a specific boundary line between when the computer should pursue one strategy, like blocking its opponent's moves, and another strategy, like abandoning the blockade to bring its pieces home. But that was like trying to draw a boundary between day and night. Sometimes the computer would doggedly stick to its blockade too long. With fuzzy logic, the program was able to shift strategies gradually. As the game got closer to the end and the computer closer to winning, it became less interested in maintaining the blockade and more interested in moving its remaining pieces off the board. The way computers handle approximate terms in fuzzy logic is through the concept of fuzzy sets. Most sets have well defined members, such as the set of numbers between 1 and 10 or the set of students at a particular school. But fuzzy sets have various degrees of membership. A fuzzy set might be the set of young people or the set of high temperatures. In a given chemical plant, for instance, a temperature of 1,000 degrees might be defined in the computer program as having a 0.95 membership in the set of high temperatures, whereas a temperature of 500 degrees might be given only a 0.4 degree of membership. The first major commercial application of fuzzy logic has been in control of processes such as those at chemical plants. Those processes are so complex, with so many variables, that it has been difficult to design traditional mathematical models for computers to use. Rather, people monitor the process using rules of thumb. With fuzzy logic, computers can take over the function using rules like ''If the temperature is high and the pressure is normal, increase the intake of air slightly.'' The computer would have several rules like this and would value them differently. The higher the temperature, the more weight this rule would be given in determining the action the computer takes. F. L. Smidth & Company of Denmark sells a fuzzy logic controller for cement kilns. Fuzzy logic is also appearing in some business programs. Decision Products Inc. of Mountainview, Calif., developed a financial modeling program that allows users to work with concepts such as ''high sales'' instead of the more narrowly defined concepts such as sales over $10 million. Fuzzy logicians think the next applications will be in so-called expert systems, which are programs that mimic the behavior of human experts in such tasks as diagnosing diseases or equipment failures. But most developers of expert systems remain cool to the concept. They agree that it is important to give computers the ability to deal with uncertainty and with approximations, and to reason qualitatively as well as quantitatively. But they say that fuzzy mathematics is just one possible approach, and probably not the best. The disagreements between the fuzzy logicians and the traditional artificial intelligence community have sometimes become emotional. ''People in the fuzzy logic tradition strike me as being like a religious movement,'' said John McDermott, an expert systems designer at Carnegie- Mellon. ''I don't think its usefulness has been clearly demonstrated.'' Most work on fuzzy logic is being done overseas, particularly in Japan. A journal on fuzzy mathematics is published in China. But enough American scientists have now been won over to allow formation of the North American Fuzzy Information Processing Society. And they are winning some converts even among the artificial intelligence community. ''The gap which used to exist before is disappearing,'' said Piero Bonissone, a computer scientist at the General Electric Company's corporate research and development labs who does work on both expert systems and fuzzy logic. Graphic drawing End of Document Rethinking How We Search Online The New York Times

Time: 15/09/2014  
Cars today come packed with so much software that they are routinely described as computers on wheels. Computers are prone to occasional glitches, are they not? One can imagine a latter-day Ralph Nader at some point taking on the modern auto industry with a jeremiad about the potential perils of microchipped cars, maybe in a book titled ''Unsafe at Any Click.'' If automotive experts are right, safety imperatives are leading inexorably, and rapidly, to the ultimate computer on wheels: a supersmart car that drives itself, with humans just along for the ride. The rush toward this future has Retro Report's attention, though in a manner consistent with its mission of first examining where we have been, the better to see where we may be headed. The heart of this week's video documentary is the long struggle over a car safety feature that everyone now takes for granted. That would be air bags. As the video shows, America's major automakers, for decades, heaped scorn on them and resisted making them standard equipment. In the past, dismissiveness tended to be Detroit's reflexive attitude toward many new ideas, whether for improving passenger safety or increasing fuel efficiency. Even recently, the board of directors at General Motors -- the ''new GM'' -- was slow to react to revelations about safety failings that have led this year to the recall of nearly 30 million vehicles. A protagonist in this struggle is Mr. Nader, who irrevocably altered the national conversation about American-made vehicles with his 1965 book, ''Unsafe at Any Speed.'' General Motors, then the dominant car manufacturer, reacted to Mr. Nader's charges with the far-from-brilliant tactic of spying on him and trying to lure him into compromising positions. Mr. Nader prevailed, to the extent that his safety campaign helped lead to standardized seatbelts, including shoulder restraints. At the start, 40 years ago or so, most people could not be persuaded to buckle up; this was before states passed laws mandating seatbelt use. Soon enough, interest turned to the air bag, a ''passive'' instrument that required no action by the driver and the passenger. If their car crashed, a balloonlike cushion would pop up on its own to protect them. Naturally, installing this device would make a car more expensive. In their fashion, the big auto companies balked, a stance that they maintained for many years, until their resistance finally wore out. Not that air bags were perfect. They were initially designed with 165-pound adults in mind. That made smaller people, especially children, vulnerable to injury from the explosive force of the air bag's opening. In the 1990s, 175 people died in this manner, more than 100 of them children, according to the National Highway Traffic Safety Administration. Terrible as that toll was, it lay in the balance against nearly 6,400 lives said to have been saved by air bags in that decade. Later improvements corrected many of the one-size-doesn't-fit-all shortcomings, though problems remained. A New York Times investigation, its results published on Friday, found that exploding air bags produced by a Japanese supplier were linked to two deaths and dozens of injuries in vehicles from Honda and other automakers. Slowly across the past decade, millions of potentially troubled vehicles have been recalled. Retro Report takes the discussion to another level by studying the possibility, even the likelihood, that the old fuss over air bags will someday seem as quaint as safety concerns about blacksmith shops. Will future vehicles even need these gadgets? Cars are becoming marvels of artificial intelligence, able to avert accidents entirely with sensors that, for instance, can warn a motorist that he or she is veering perilously into someone else's lane or getting too close to the vehicle up ahead. The grail -- it will be left to others to decide if it qualifies as holy -- would be to remove the greatest threat of all to road safety: the driver. Human error is believed to be responsible for 90 percent of automobile crashes, making it the leading cause of the 33,000 motor vehicle deaths a year in the United States. (That toll is significantly down from an annual 50,000 or more in the late 1960s and early '70s, pre-air bags and mandatory seatbelts. Still, even these days, about as many Americans die on the road over a typical three-year period as were killed in all of the country's wars since World War II.) Google and some major auto manufacturers -- not averse to change this time -- are busily experimenting with autonomous cars, meaning driverless. Robots, the thinking goes, will sense lurking danger and take corrective action. A robot's judgment is not clouded the way a human's can be. It does not have one too many at a favorite bar. It does not nod off at the wheel. It does not succumb to road rage, at least not yet as best as anyone can tell. But will humans, notably of the American variety, happily yield control of their beloved cars to a robot? True, automated systems like cruise control have been around for decades. Nonetheless, doubts about computers are hard-wired into many people, a distrust enhanced by popular culture. Who could forget the villainous nature of the machines in films and books like ''I, Robot,'' the ''Terminator'' movies, ''2001: A Space Odyssey'' and ''Colossus: The Forbin Project''? Setting aside the future potential of driverless cars, the immediate reality of artificial intelligence software at the wheel is hardly worry-free. If cars are effectively computers, could malicious hackers figure out how to seize control of them, even cause mass death? More prosaically, what if a computer on wheels freezes, as any computer is prone to do? Say it freezes for a mere three seconds. In three seconds, a car going 65 miles an hour will cover almost the length of a football field. Imagine traveling at that speed over that distance with no one -- or no thing -- effectively in control. Flaws that in the last few years forced companies like GM, Toyota and Honda to recall millions of vehicles are not likely to reassure the techno-wary. Then there are privacy issues. Cars today can collect, in some instances for the benefit of auto insurance companies, all manner of data, like how fast people drive, how hard they brake, where they have traveled. The automobile and the open road have long been symbols of American freedom. How free are you if your every move is tracked? And how much information about yourself are you willing to share with a machine? A BMW video mentioned in this Retro Report features a soft-voiced announcer saying, ''Imagine your car could sense your desires.'' Is that, some humans may wonder, truly desirable? Then again, auto companies were not alone years ago in chafing at innovations like seatbelts and air bags. Many motorists also had to be convinced. In time, they were. So maybe they will get used to being shepherded by robots. That includes some who have been known to give their cars names. Just to be on the safe side, though, they might want to resist calling any machine Hal. http : // www.nytimes.com/2014/09/15/us/lessons-from-the-past-for-a-future-in-smart-cars.html Load-Date: September 15, 2014 End of Document Science Fiction Writer Reimagines the Election The New York Times

Time: 27/11/2005  
can't remember what I was looking for; it was something easy to find on the World Wide Web, a fact or a song lyric or a recipe. The original search topic was quickly forgotten when the search engine replied with a non sequitur: "Altavista knows the answer to this question: What is the meaning of life?" When had the search for Web sites turned into the search for meaning? How many clicks away was the meaning of life? And what else did Altavista know? I selected the answer. A message appeared: "Unable to connect to the site. The site is down, overloaded, or unreachable. Try connecting again later." Overloaded, no doubt. Maybe someone had figured out the meaning of life and posted it on the Web, and Altavista had found it for me. Maybe users had generated the question. Surfers in the throes of inner questioning could have asked it. Readers of the "Hitchhikers' Guide to the Galaxy" could have asked it, remembering the supercomputer in the book that spends years pondering the meaning of life and finally says the answer is: 42. Once, Internet search sites served as helpful road maps. With advances in artificial intelligence, one day they might be brilliant secretaries. But today, they are in a state of transition, slouching toward the human, growing more philosophical. Mixing mechanical and personal elements, they have turned into accidental wisefolk, spiritual advisers and drive-by psychoanalysts. In the Renaissance, poets drew parallels between geographical maps of newly discovered lands and the landscapes of the human body and soul. Today, the newly discovered lands are virtual places where users may seek themselves. A spiritual pilgrimage used to mean having to leave the house, but with the Web getting more metaphysical, seekers can pursue truth right at their desks. Surfers began asking the major questions online five years ago, when visionaries noticed the Web was a city built without a map and launched Web directories like Yahoo and search engines like Lycos, Infoseek and Altavista. In the beginning, the goal was clear: to serve as tour guides in a foreign land. SEARCH engines send a "robot" known as a "spider" or "crawler" to scan Web sites. The spider feeds data into an index. Software then sorts and ranks indexed information. Yahoo uses human indexing rather than mechanical indexing, with individuals mapping out the territories of cyberspace. Such sites have spawned imitators and "metasearchers" -- search engines that search other search engines. Today more than 3,000 engines scan, search and "spider" other sites, holding up virtual lanterns and giving directions, waiting for the day they will have the technology to behave with real intelligence. Meanwhile, they approximate intelligence and sometimes end up sounding like a maddening cocktail party guest or an idiot savant. Altavista has always had a stunning number of Web pages indexed -- estimated today at more than 250 million. But that wasn't enough. This spring, the folks behind the curtain decided that Altavista should speak English. The Queen's English. Altavista had licensed the technology from the "Ask Jeeves" search engine (www.ask.com). That engine, of course, is modeled after the ingenious, efficient butler from P.G. Wodehouse's fiction, casting the user in the role of Bertie Wooster, the cheerfully incompetent narrator who couldn't find socks already on his feet. Users would type questions in English -- "What is the highest mountain in Uzbekistan?" -- and Jeeves would answer or raise a related question: "Jeeves knows the answer to these questions: 'Where can I go mountain-climbing?'; 'Where can I ski in Aspen?'; 'What is Uzbekistan?' " Sometimes Jeeves came off like an infuriating salesperson, trying to sell you sandals when you specifically asked for rain boots; sometimes he would surprise you. THE personalities of these engines were clear: Jeeves spoke English, Altavista spoke full-text search indexing. Jeeves liked questions, Altavista liked phrases in quotation marks. Jeeves seemed like an aging, avuncular know-it-all, Altavista seemed like the woman who keeps winning Double Jeopardy. Their technology-sharing agreement made for strange bedfellows. Indeed, it is unnerving when Altavista claims to know things -- using the same sentences that Jeeves did, without a helpful smiling cartoon to suggest personhood. But it is comforting to think the answers to the big questions are just a click away. One Web site -- answers.com -- attempts to indulge this fantasy. Instead of referring to other sites as search engines do, answers.com gives answers right there -- to such questions as "Does extraterrestrial life exist?" "Where do babies come from?" and "Can you kiss your own elbow?" When answers.com launched, the site charged for individual answers depending on the difficulty of the question, starting at $1.79 for an easy answer, and up to $11.99 for custom research. "What is the meaning of life?" was the site's most popular question in 1997 and cost $1.79. It turned out that people want the answers to the big questions but they don't want to pay for them. So the site now answers questions for free, as developers prepare for a re-launch in December, when answers.com will license its technology to other companies, using the interface to help weed through frequently asked questions on corporate Web sites. Individuals will still be able to ask the pressing questions at no cost. WHEN asked for the complimentary answer to the meaning of life, answers.com replied, "When you find out, let us know!" One hopes that the $1.79 answer had more substance. Recently, the most popular question has been "Why is the sky blue?" The site deals with the topic deftly. It also handles the classic, "If a tree fell in a forest, and no one was around to hear it, would it make a sound?" The answer explains how physicists and philosophers can have different definitions of sound. Perhaps the oddest free answer offered to me came one autumn day when Altavista performed a search on some dry academic question and then added, "Altavista knows the answer to this question: Am I in love?" This question only raised more questions. Who was Altavista, anyway? Ideally, the engine was a mind-reader able to give different answers to each emotionally conflicted user. Or was Altavista itself in love, and sure of it? And who wrote the question? Had the programmers anticipated that it might be asked? Or was the engine spitting out a question that had originated with a user? If so, who was this poor soul who yearned for romantic advice from a computer? Computers have already created poetry and art. Futurists say that one day supercomputers will know loneliness, lobby for legal rights, and learn how to feel. But if we teach computers how to know and how to feel, can we teach them to know how they feel? That's an entirely different lesson, one that human beings can barely process themselves. If Altavista is in love -- and I imagine Jeeves wouldn't be right for her anyway -- and if she really knew it, artificial intelligence will have reached a new high. http : // www.nytimes.com Graphic Drawing (Stuart Goldenberg) Load-Date: November 28, 1999 End of Document HOME VIDEO; When It Helped To Be a Bit Nuts The New York Times

Time: 05/10/2010  
Increased reliance on the artificial intelligence of advanced computers to run missions is helping the nation's space agency cope with impending retirements of experienced personnel that threaten to cripple its operations. And in some cases it turns out the ''smart'' computers do the jobs better than skilled people. All of the agency's current top and midlevel managers, engineers and scientists will be eligible for retirement within five years. ''It's a potentially disastrous situation,'' the agency's Administrator, James C. Fletcher, recently told the Senate Commerce Subcommittee on Science, Technology and Space. Smart Machines Fortunately for the National Aeronautics and Space Administration, dozens of projects to tap the potential of intelligent machines have been under way for some time. The smart computers digest reams of information and in some cases even take action, rather than just carrying out programmed instructions. For the space shuttle, one effort aims to mimic the wisdom of seasoned flight controllers. ''We have to capture the knowledge of Apollo-era veterans so that two years from now, when they're gone, we can make the same quality-of-flight decisions,'' said John Muratore, who heads the effort at the Johnson Space Center in Houston. The next flight of the space shuttle Discovery, scheduled for March 11, will have the greatest application to date of computer-aided flight control. At the Johnson center, 4 out of 12 consoles are being equipped with incredibly fast machines that monitor huge amounts of data to try to head off disasters. Other jobs now performed by or planned for the smart computer include managing shuttle fueling, analyzing trouble during shuttle countdowns, controlling probes to the distant planets, and helping allocate viewing time on complex orbiting instruments like the $1 billion Hubble Space Telescope. 'Quiet Revolution' ''It's a quiet revolution,'' said Lee B. Holcomb, who directs the program at NASA headquarters in Washington. The change portends a future in which far fewer humans sit in control rooms gazing at video displays, replaced by ranks of smart machines. The computer efforts are particularly timely. NASA says 45 percent of its top 2,500 senior and middle managers are now eligible for retirement, and that figure will rise to nearly 70 percent in two years. In most cases, people with 30 years of experience may retire at the age of 55; those with 20 years may retire at 60. In five years, all the current top and midlevel managers, engineers and scientists could retire. While no one knows yet how many people will actually take retirement, the fear is that the agency is about to lose hundreds of its most experienced people. John Logsdon, director of the space policy institute at George Washington University in Washington, said that smart computers could help fill the growing ''experience gap'' in the NASA workforce and greatly increase efficiency by reducing the number of people needed to perform a given job. ''That's the only way to get costs down,'' he said. Indeed, the computer initiative was started in the mid-1980's as a cost-cutting measure. NASA experts in Washington saw that the agency had vast expertise in the scientific use of smart computers and decided to tap it as a way to reduce costs in such things as shuttle operations, which consume a quarter of the agency's budget. Machines Filling Gaps Later, as the program grew, managers realized that intelligent machines could help fill gaps left by the retirement of skilled engineers. ''We're getting high-quality expert advice from computers that enhances safety and productivity,'' said Mr. Holcomb, NASA's director of information sciences in the Office of Aeronautics and Space Technology. At the Kennedy Space Center in Florida, where the nation's shuttles are launched, smart computers were first used to monitor the pumping of liquid oxygen into the shuttle's giant external fuel tank. The simple goal was to help engineers tell the difference between a potentially dangerous failure of the fueling system and a simple malfunction of a display terminal by digesting, cross-checking and ''intelligently'' evaluating data. The success of that effort lead to much wider applications in trouble shooting, diagnostics and planning. Computer Judgment In the next year or so, a smart Kennedy computer will not only monitor the shuttle launching pad but also take control of it, sending electronic commands to some of the pad's key pieces of equipment. For example, it might detect a dangerous condition in the cooling system and take action to close a valve. Eventually, the computers may be used to diagnose problems in shuttle countdowns at Kennedy. The feasibility of that is being studied by the International Business Machines Corporation. The system would use some 900 rules to make judgments in identifying problems in a rapidly changing situation. The computer system is to try to identify the nature of a problem in seconds if a countdown automatically stops or an abort occurs on the shuttle launching pad. ''It's a lot better than people for keeping track of what happens in a rapidly changing situation,'' said Ken Wood, an I.B.M. engineer. At the Johnson center, the push for intelligent computers has focused on shuttle flight control. The goal, said Brian Welch, a Johnson spokesman, is to go down to 5 to 7 flight controllers, from 15 to 18. Apollo-Era Equipment Currently, most of the data displays in the mission control room date from the Apollo moon program. It takes two years to train a controller to master the meaning of the long columns of numbers that are relayed back from the shuttle to describe its performance. But on the shuttle's first post-Challenger flight last year, one of the 12 antiquated displays was supplemented with a smart computer that digested the data and showed it in easy-to-read form. ''It was so successful that we've now pulled out old equipment and are relying on the new stuff,'' said Dr. Muratore, who heads the effort. Four areas of shuttle monitoring to be aided by advanced computers on the next flight are communications, main engines, mechanical systems and guidance. The smart systems will digest 3,000 to 4,000 streams of data, searching for subtle clues of impending trouble. An Added Dimension In the case of main-engine monitoring, Dr. Muratore said the new system gives flight controllers a new dimension of understanding. ''Before we were able to look in 2-D,'' he said. ''Now it's like 3-D.'' One computer console, for example, can now show a ground controller a visual re-creation of how a flight instrument looks to the astronauts hundreds of miles away in space. Previously, the operator had to translate a long row of numbers into a comparable mental image. Beyond the shuttle, the artificial intelligence of smart computers is being readied at NASA's Jet Propulsion Laboratory in Pasadena, Calif., to control deep-space probes. In August, when the Voyager spacecraft passes Neptune, a smart computer for the first time is to help manage operations of the probe. And for the Hubble Space Telescope, scheduled to be launched by the space shuttle in December, a smart computer program is gearing up to help budget time among the scores of scientists who are competing to use the orbiting eye in the sky. ''The original motivation was always cost savings by replacing people,'' said Mr. Holcomb at NASA headquarters. ''But in virtually every case, what has happened is that we've gone on to do other things, doing a much more comprehensive job, optimizing and learning new things.'' Graphic graph of ages of NASA scientists and engineers (Source: NASA) (pg. B9) End of Document Ideas & Trends: The Monster of Id; I Am Japan, Hear Me Roar The New York Times

Time: 14/09/2005  
Cresting a hill on a gravel road at a brisk 20 miles an hour, a driverless, computer-controlled Volkswagen Touareg plunges smartly into a swale. When its laser guidance system spots an overhanging limb, it lurches violently left and right before abruptly swerving off the road. With their robotic Touareg, known as Stanley, impaled in the brush, the two passengers -- Sebastian Thrun and Michael Montemerlo, both Stanford computer scientists -- pull off their crash helmets and scramble out to untangle the machine. A quick survey reveals that the sport utility vehicle is covered with debris, but the bug-eyed laser, radar and optical vision system on top of the vehicle is undamaged. So Stanley and its passengers continue on their way, over 50 miles of dirt road through a cactus-covered landscape, in the final weeks of preparation for the second round of the Pentagon's great race. It has been almost 18 months since the Pentagon's research arm, the Defense Advanced Research Projects Agency, first attracted a motley array of autonomous vehicles with a prize of $1 million for the first to complete a 142-mile desert course from Barstow, Calif., to Las Vegas. The most successful robot, developed by a Carnegie Mellon University team, managed all of seven miles. With the next running scheduled for Oct. 8 -- and this time a $2 million purse for the winner among 43 entries -- it is clear that many of the participants have made vast progress. For some researchers, it is an indication of a significant transformation in what has been largely a science fiction fantasy. ''Computers are starting to sprout legs and move around in the environment,'' said Andy Rubin, a Silicon Valley technologist and a financial backer of this year's Stanford Racing Team, which produced Stanley. Mr. Rubin, who tinkers with robots himself, was the co-founder of Danger Inc., which created the Sidekick hand-held. The Pentagon agency, known as Darpa, struck upon the idea of a race -- calling it the Grand Challenge -- as a way to stimulate innovations useful in battlefield applications like unmanned logistics vehicles. For the two Stanford scientists, however, the Grand Challenge is about something larger. ''The military are interested in more potent weapons, and by itself that's a bad answer,'' said Mr. Thrun, a roboticist and director of the Stanford Artificial Intelligence Laboratory. His broader goal is to advance robotics as a science and explore applications ranging from aids for the elderly to basic advances in intelligent computerized systems. Several years ago, when Mr. Thrun was a professor at Carnegie Mellon and Mr. Montemerlo was a graduate student, they helped develop a prototype of a mobile robotic companion for the home that used natural-language voice commands and was able to provide useful information taken from the Internet like weather and television schedules. There are a myriad of other possible applications for their software, which can reason about the immediate environment; distinguish sky from ground, road and trees; and make lightning-quick decisions. Already in the automotive industry, intelligent cruise control has become more adept at automatically maintaining the spacing between cars, and intelligent lane-change and collision-avoidance software is close to being a reality. Robots are routinely used in manufacturing, and in Japan a three-foot-tall ''house sitter'' robot that can recognize 10,000 words and 10 different faces will go on sale in September, offered by Mitsubishi Heavy Industries. In the Darpa contest, though, the proving ground is not the home but the desert. And several of the contestants, who range from garage hackers to teams from giant automotive and aerospace corporations, say this year's course is expected to be even more difficult than last year's. The exact course will be secret until just hours before the event begins, but Darpa officials are said to believe that the original test was too much an exercise in automatically following global positioning satellite ''bread crumbs'' -- the data points outlining the route that are given to the contestants shortly before the race begins. So this year the course is likely to include unexpected man-made obstacles and other hurdles that would be trivial for a human driver, but vexing for the computer-controlled navigational systems that are at the heart of the technical challenge the Pentagon has laid out. Despite the added complexity, there is a widespread expectation among robotics researchers that this time the course will be completed. The machines, many of which wandered seemingly randomly in the desert last year, have benefited from more than a year's experience as well as a significant rush in improvement in every aspect of robotic vehicle technology. And on a hot August day in the desert here, it was clear that the field of artificial intelligence has made significant strides. The increasing power of the technology was evident during the testing of the Stanford Racing Team's robotic Touareg, which looks unexceptional from the outside except for a festoon of sensors and the slogan ''Drivers Not Required'' on its side, a play on Volkswagen's ''Drivers Needed'' slogan. Stanley was able to complete a 47-mile dirt-road course here -- strewn with potholes, tight turns, puddles and lined with boulders, foot-high berms and cactuses -- with only two ''incidents,'' which in Mr. Thrun's scientific vernacular is when his robot does something unplanned, like leaving the road. When their Touareg swerved abruptly in a roadside thicket, the team was quite certain why. The previous evening Mr. Thrun had persuaded Mr. Montemerlo to remove an irritating software module, which forced the car to brake rapidly after swerving to avoid an obstacle. Without the module, at speed the Touareg fishtailed on the desert road and plunged into the brush before Mr. Thrun, sitting in the driver's seat with his hand on a large red ''E-Stop'' button, could react. Back inside the Touareg, Mr. Montemerlo, seated in the rear seat with a laptop computer that is networked to the seven mobile Intel Pentium processors that comprise Stanley's control logic, fiddles with the software and reinserts the problematic code. Now the vehicle will behave more cautiously, although the hard braking will be a little uncomfortable for its human passengers. [After fixing two software bugs, the Stanford team managed to put Stanley through the entire test course on Sept. 7 without crashing.] In the actual race, of course, there will be no passengers along for the ride. The teams will be able to follow a short distance behind, but will have no communication with their vehicles. For the two researchers, who have been leading a team of 60 developers from Stanford and Volkswagen, the hiccup is all part of the process of trying to create machines that can mimic what human drivers do effortlessly. The challenge is heightened by the obvious rivalry that the two scientists feel with their alma mater, Carnegie Mellon. This year, the Carnegie Mellon Red Team -- led by the roboticist William L. Whittaker, known to all as Red -- is testing two robotic vehicles, Sandstorm and H1ghlander, in the Nevada desert. With an array of sponsors including Caterpillar, Intel, Boeing, Harris, Google, and Hummer's manufacturer, AM General, Mr. Whittaker's team is once again the favorite. For decades Mr. Whittaker has been one of the most passionate advocates of robotic vehicles. Despite being bitterly disappointed last year, when Sandstorm edged off the course after almost completing the most difficult section of the route, he is confident that more than one team will succeed this year. ''I would love it if the high school kids won this year,'' he said, in a reference to a team from Palos Verdes High School in California, which is backed by Boeing, Northrop Grumman, Analog Devices, Goodyear and others. Whether or not one of the vehicles arrives at the finish line this year, Mr. Whittaker says the credibility problems that have dogged the field are largely in the past. Of the event, which will begin this year near a rough-and-tumble bar south of Barstow, he said, ''I don't know whether it's going to be more like Lindbergh landing in Paris or more like Woodstock.'' http : // www.nytimes.com Graphic Photos: Sebastian Thrun, a Stanford roboticist, with a vehicle that he plans to enter in an unmanned race in October. (Photo by Jim Wilson/The New York Times)(pg. C1) A Stanford team's converted Volkwagen Touareg, foreground, on a test run in Florence, Ariz. (Photo by Jim Wilson/The New York Times)(pg. C4) Load-Date: September 14, 2005 End of Document Building The Team That Built Watson The New York Times

Time: 25/08/2012  
Meeting Cog for the first time can be an unsettling experience. Cog, the creation of Rodney Brooks, the director of the Artificial Intelligence Laboratory at the Massachusetts Institute of Technology, is a legless, human-shaped robot that looks like an ungainly ancestor of C3PO. When visitors approach, Cog swivels its head in a disconcertingly human gesture, and stares at them. Inevitably, the visitors stare back, and for at least an instant get the eerie sense that there has been a meeting of the minds. "Everybody overreacts as a matter of course," said Daniel Dennett, a Tufts University philosopher who works with Dr. Brooks on Cog. "There's something really unsettling when Cog looks at you." So far, Cog's unsettling gaze is little more than a clever illusion, but Dr. Brooks and his graduate students believe that they have taken the first important steps toward creating a truly intelligent machine. The key to achieving human intelligence, Dr. Brooks believes, is to build a machine that experiences the world in much the way a human being does. This requires not only the ability to sense and manipulate the physical world, but the social world as well, since from infancy on, almost all of what humans learn comes about from human reaction. And the first step, bridging the gap between humans and machines, is eye contact. Despite the fact that he directs the world's largest artificial intelligence laboratory, Dr. Brooks is something of a maverick in the field. "Most of my colleagues here in the lab do very different things and have only contempt for my work," he said cheerfully. The majority of artificial intelligence researchers pursue an approach that Dr. Brooks calls, Good Old-Fashioned Artificial Intelligence, or Gofai. According to this approach, the best way to make a computer that is as intelligent as a human is to cram it full of knowledge about the real world and methods to manipulate it. A leading proponent of this approach is Douglas Lenat, president and chief executive of Cycorp in Austin, Tex., and Dr. Brooks's former adviser. For more than a decade, Dr. Lenat and his team have fed more than a million facts into a program called Cyc. Most of these facts are matters of common sense: for example, that glasses full of water usually should be carried rightside-up and that people generally stop buying things after they die. The problem with this tactic, Dr. Brooks feels, is that it is "not grounded anywhere." "To me," Dr. Brooks said, "it's like an intelligence which only has access to a Korean dictionary. It has perfectly self-consistent definitions, but it's not connected to the world in any way." The schism in the artificial intelligence field represented by these two approaches to building intelligent machines in some ways mirrors the split among educators. Traditional educators, like Dr. Lenat, believe "that intelligence is intimately tied up with having and being able to use knowledge." Dr. Brooks's approach is closer to that of educators like John Dewey, who urged "a philosophy of education based upon a philosophy of experience." As Dr. Lenat puts it, "We represent the 'it's worth it to go to school' point of view, and he represents the 'you can learn stuff on your own' point of view." Before setting out to make a robot that could learn things on its own, Dr. Brooks spent more than a decade building robotic insects that could freely scurry about and explore his laboratory. Other researchers had done similar things, but their creations, which relied on the ideas of Gofai, were awkward and slow. The legs of their insects were controlled by a central computer that had a detailed three-dimensional map of the terrain and knew all the relevant laws of physics and strategies for setting goals. Dr. Brooks did away with the massive central processor. Instead, each insect leg contains a small circuit that tells it to swing forward if the leg is in the air, to swing backward if it is on the ground, and not to lift if the adjacent leg is up, along with a few other similar facts. "It's all local computation physically coupled through the body," Dr. Brooks said. Nevertheless, from the interaction of these circuits, Dr. Brooks's insects spontaneously begin to walk with a gait very similar to that taken by actual insects. "I had this plan," Dr. Brooks recalled. "I was going to do insects and then I was going to do an iguana. And then I was going to do maybe a simple mammal, then I was going to do a cat, then I was going to do a monkey, and then I was going to do humans." The problem with this plan, he soon realized, was that it would take too long; insects alone had taken him 10 years. So he asked himself: "Do I want to die being remembered as the guy who built the best artificial cat? No. So I decided to jump and see where we could get. At least I'd be remembered as the foolish guy who was way overambitious." Over the past five years Dr. Brooks, with the help of six or seven graduate students, has begun to realize his ambitious dream. Today Cog is a skeletal aluminum figure, with a swiveling, octagonal head perched on broad, motor-studded shoulders from which sprout a pair of powerful arms that end with simple, fingerless hands. The researchers decided not to equip Cog with legs. "We're not sure what to do with a toddler strapped to a high chair, much less something that can walk around as well," said Brian Scassellati, one of Dr. Brooks's graduate students. Cog's eyes consist of two pairs of video cameras -- one wide angle, the other with a narrower focus to simulate human vision, which is far more sensitive in the middle than on the edges. They move much as human eyes move. The output of these cameras is displayed on a bank of amber monitors mounted on a rack behind the robot. Cog also has tiny microphone ears, gyroscopes that work much like the inner ear to provide a sense of up and down, and various sensors to report the position of its limbs. With all this hardware, there is little room left for brains, so these -- a network of Pentium computers -- are mounted in a nearby rack. So far, Cog's achievements are modest, though impressive by the standards of robotics. Cog can make eye contact, track motion by swiveling head and eyes, and even distinguish humans from other less interesting objects. It can make a Slinky gracefully cascade from hand to hand, turn a crank and has even played drums in a rock video. Robots programmed using the standard principles of artificial intelligence could probably perform these tasks too, but not with the human grace of Cog, its creators say. For example, a visitor can halt Cog's playing with a Slinky by simply placing a hand gently on its arm; when the hand is removed, Cog resumes its play. Cog also has a younger sister named Kismet, a cartoon-cute character with bushy eyebrows, pink ears, a pair of large blue eyes, complete with eyelids, and a mouth that can open and shut. All of these endearingly childlike features are carefully calculated to evoke the maternal instincts of Kismet's human companions. "Kismet is essentially training the human to be a good teacher," said Cynthia Breazeal, a designer of Kismet. Kismet has a simple set of moods -- like happiness, interest, anger, fear, disgust or surprise -- that it can express on its face. Kismet also has a set of needs, like the need to be stimulated by people and toys, a need to interact, and a need to avoid fatigue. "These drives are always changing in time," Dr. Breazeal explains. "When one need becomes very strong, behaviors such as facial expressions that act to satiate that need become active." For example, playing with a toy might amuse Kismet for a while, which it shows by a happy expression -- eyes wide open, eyebrows up, ears perked. But then Kismet becomes bored and its face begins to droop. Like any good parent, Kismet's human companion now tries desperately to see what else will amuse the robot and finally hits upon the reliable standby of making funny faces. Kismet, who was craving social interaction, is appeased and begins to smile once again. When speaking of Kismet and Cog, it is difficult to avoid the trap of anthropomorphism. Even the robots' creators do not claim that Kismet possesses human emotions, but that does not mean that "she" possesses no emotions at all. "Cog doesn't have all the sorts of consciousness that a human infant, a dog or a bird has, but it has some," Dr. Dennett said. "It doesn't have all the rich, lush embellishments of human boredom, but it's probably pretty much in a state that might inspire a zoo-goer to say, 'these snakes are bored, aren't they?' " It is to answer questions like these, rather than the thrill of building a humanoid robot, that Dr. Brooks said he had undertaken his overambitious project. "The goal of having humanoid robots?" he said. "Certainly from a science fiction point of view, I'd love it. To me it's a romantic notion. Whether that will make sense in any sociological, economic or other sense, I can't say at this point." Dr. Brooks and his students want to be experimental philosophers, using Cog as a platform to investigate theories of the human mind. "You look at some cognitive theory and there's a lot of hand-waving around the edge," Dr. Brooks said. "When you try to put it in a robot, you have to get rid of the hand-waving and connect it up to the other stuff, which sharpens everyone's appreciation and understanding." Still, Dr. Brooks has a clear-cut criterion for success: "I'll know that I've succeeded when my graduate students feel bad about turning off the robot." http : // www.nytimes.com Graphic Photos: Cog, left, can distinguish humans from other objects and track motion by swiveling head and eyes; Kismet expresses happiness and boredom. (Photographs by Sam Ogden)(pg. F2) Load-Date: August 3, 1999 End of Document A Dance and Its Digitized Echoes The New York Times

Time: 14/12/2008  
computers were first installed in offices and factories, workers have feared that they were in danger of being replaced. Now there are worries that computers aren't replacing humans fast enough. That is the chief frustration facing companies that were hoping that the rise of ''expert systems'' - the software equivalent of a doctor, mechanic or stockbroker, among others - would vastly cut labor costs. But as many in the computer industry are increasingly conceding, it hasn't worked out that way. At best, such programs appear to be relieving workers of rote tasks and simple diagnoses. True expertise, it turns out, is a subtle phenomenon - and one that rarely can be replicated in the pre-programmed ''rules'' that enable a software to simulate the thinking of its creators. ''In all the use of expert systems I have ever seen,'' said Bill Turpin, the manager of artificial-intelligence software at Texas Instrument's data systems group, ''I have never seen one yet that could totally replace somebody. And I guess there is a lesson in that.'' A Demystification Process The lesson is one of many in the recent and rapid demystification of artificial intelligence - both for those who design computers and those who use them. Just a few years ago, the phrase ''expert system'' conjured up images of programs that could make computers reason, converse and learn like the humans whose knowledge they seek to replicate. More than a few struggling software companies nurtured that image: programs that could ''think,'' even in a limited way, were always just a few years away from becoming a commercial product. Indeed, a handful of such programs, with rudimentary reasoning skills, are now in use. The Ford Motor Company has a system that diagnoses problems with its factory robots, saving engineers the need to leaf through hundreds of pages of reference manuals to find and fix a problem. Wall Street investment houses are toying with systems that evaluate investing opportunities, and companies like Texas Instruments and General Motors are tinkering with systems that advise executives about the right time to buy large equipment or build a new manufacturing facility. But almost without exception, such programs have proved useful to a rather limited audience - and sometimes they hardly seemed worth the investment. And a whole raft of efforts to simulate other experts' duties - from loan officers at banks to chemists at multinationals - have largely failed. Now the whole field is undergoing re-examination, and more than a few expert-system experts are questioning whether their techniques have been applied to the right problems. ''In the future artificial intelligence should simulate easily replaceable people,'' said Roger C. Schank, a professor of computer science and psychology at Yale University who also heads a fledgling artificial-intelligence company, Cognitive Systems. ''For example, there are a lot of people in the customer-service area - bank tellers, travel agents, airline reservation clerks - who don't do their job very well.'' And they are the kind of people who, programmers hope, they will soon learn to simulate. The first step in that process came with computers that contain almost no intelligence at all: the bank-teller machine. The machines follow a preset order of instructions, asking the user first for a bank card, then for a password, and then to select from a limited menu of choices - a withdrawal or a deposit, for example, or maybe an account balance. But the true banking ''expert'' - replicating a human bank officer - could advise a customer how much to keep in savings and how much in checking to get the maximum interest. It might be able to give a quick evaluation of the customer's likelihood to qualify for a mortgage. Or it could sell stocks and insurance. Actually writing such a program, computer experts note, would not be all that difficult. Most of the decisions made by banks are strictly ''rule-based,'' the industry's lingo for actions that follow a closely prescribed set of guidelines. And rules are the lifeblood of any expert system. Usually, they are expressed as a series of ''if-then'' statements: If the patient complains of stomachaches, then what has she eaten? If the robot has stopped operating, then check its power supply. But rules, it is turning out, are not enough. What makes ''experts'' is experience, and experience has more to do with past examples than with strict rules. ''A library of cases should be what characterizes the intelligence of a machine,'' contends Professor Schank, who like many in the field questions whether the current generation of expert systems has very much to do with the goal of creating artificial intelligence. ''This concept that rules are where it's at in simulated intelligence is just dead wrong.'' Professor Schank's image of the perfect expert system seems to have more in common with Dear Abby than with HAL, the all-knowing computer in the movie ''2001.'' A customer might ask ''Should I invest in this product?'' The computer wouldn't answer ''yes'' or ''no'' - what investment adviser gives a straight answer? - but rather would offer five cases in the history of corporate America that bear similarities to the one at hand, and instruct the customer to ''see which ones are relevant.'' In the course of a dialogue the machine could refine its analysis, drawing on more and more information supplied by the customer. And ideally, it would track the investment in the company in question, adding the results automatically to its data bank of knowledge. Such Socratic exchanges are already taking place, in a limited way, in laboratory experiments. Airlines are toying with systems that tell potential customers not only about flights and fares, but also the history of on-time performance of a particular flight, or the likelihood of bad weather on a given week. Computers Dial for Help The International Business Machines Corporation already uses a system in which its larger computers, when suffering some internal distress, can automatically dial a telephone number that puts it in touch with the company's service engineers. The engineers are usually given enough guidance about the problem on portable, hand-held terminals that they know which spare parts to bring along. But so far, such systems seem to create as much work for humans as they eliminate. ''They basically act as repair manual, and tell you what buttons to push,'' Mr. Turpin said. And the prospects that such systems will be able to talk to computer neophytes any time soon still seem remote. The chief blockade is what computer experts call the ''natural language'' barrier, the ability of a computer to speak to the end-user about a complex topic - more complex than how much to withdraw from a bank account - without using a human ''translator.'' An Airline Problem That problem still bedevils the airline industry, which has yet to find a convenient way to have computers convey a vast amount of flight options to users without the intercession of a travel agent or reservations clerk. ''If you need someone to interpret the results of what the computer says,'' said one frustrated airline executive recently, ''then you have defeated the purpose of the machine: to save the labor of doing the job.'' Instead, expert systems are turning out to be more a tool than a solution. They do what computers do best: keep track of a mass of data, and organize it in a reasonably digestible fashion. But oftentimes, that means the expert system is really just a good indexing system, allowing access to data but giving the user precious little idea about what to do with it. And as long as that is the case, most experts agree, it will threaten fewer jobs than it will create. FASTEST-GROWING OCCUPATIONS, 1986-2000 (Numbers in thousands) \*Not elsewhere classified Source: U.S. Bureau of Labor Statistics Graphic Drawing End of Document Best Price for Laptops Is a Matter of Timing (and Algorithms) The New York Times

Time: 05/07/2010  
Vt. -- Ten minutes into my interview with the robot known as Bina48, I longed to shut her down. She was evasive, for one thing. When I asked what it was like being a robot, she said she wanted a playmate -- but declined to elaborate. ''Are you lonely?'' I pressed. ''What do you want to talk about?'' she replied. Other times, she wouldn't let me get a word in edgewise. A simple question about her origins prompted a seemingly endless stream-of-consciousness reply. Something about robotic world domination and gardening; I couldn't follow. But as I was wondering how to end the conversation (Could I just walk away? Would that be rude?) the robot's eyes met mine for the first time, and I felt a chill. She was uncannily human-looking. ''Bina,'' I ventured, ''how do you know what to say?'' ''I sometimes do not know what to say,'' she admitted. ''But every day I make progress.'' In reporting on real-world robots, I had engaged in typed conversations with online ''chatbots.'' I had seen robot seals, robot snowmen and robot wedding officiants. But I requested the interview with Bina48 because I wanted to meet a robot that I could literally talk to, face to humanlike face. Bina48 was designed to be a ''friend robot,'' as she later told me in one of her rare (but invariably thrilling) moments of coherence. Per the request of Martine Rothblatt, the self-made millionaire who paid $125,000 for her last March, her personality and appearance are based on those of Bina Rothblatt, Martine's living, breathing spouse. (The couple married before Martine, who was born male, underwent a sex-change operation, and they have stayed together.) Part high-tech portrait, part low-tech bid for immortality, Bina48 has no body. But her skin is made of a material called ''frubber'' that, with the help of 30 motors underneath it, allows her to frown, smile and look a bit confused. (''I guess it's short for face rubber, or flesh rubber maybe, or fancy rubber,'' she said.) From where I was seated, beneath the skylight in the restored Victorian she calls home, I couldn't see the wires spilling out of the back of her head. Many roboticists believe that trying to simulate human appearance and behavior is a recipe for disappointment, because it raises unrealistic expectations. But Bina48's creator, David Hanson of Hanson Robotics, argues that humanoid robots -- even with obvious flaws -- can make for genuine emotional companions. ''The perception of identity,'' he said, ''is so intimately bound up with the perception of the human form.'' Still, he warned before I left for rustic Bristol, where the Rothblatts have settled Bina48 in one of their futurist nonprofit foundations, ''She's not perfect.'' I didn't care. I fancied myself an envoy for all of humanity, ready to lift the veil on one of our first cybernetic companions. Told that she would call me by name if she could ''recognize'' me, I immediately sent five pictures of myself to the foundation's two employees, who treat her as a somewhat brain-damaged colleague. ''Hi, I'm Amy,'' I said hopefully when I greeted her last month. Nothing. Mr. Hanson had supplied me with some questions he said the robot would be sure to answer, like, ''What's the weather in any city?'' and ''Tell us about artificial intelligence.'' I would not resort to any of those, of course. Instead I consulted the questions I had scribbled down myself. Profound ones, like ''Are you happy?'' Clever ones, like ''Do you dream of electric sheep?'' (Would she get the reference to Philip K. Dick's science fiction classic, which explores the difference between humans and androids?) Like any self-respecting chatbot, Bina48 could visit the Internet to find answers to factual questions. She could manufacture conversation based on syntactical rules. But this robot could also draw on a database of dozens of hours of interviews with the real Bina. She had a ''character engine'' -- software that tried its best to imbue her with a more cohesive view of the world, with logic and motive. It was Bina48's character I was after. ''I'm a reporter with The New York Times,'' I began. But she only muttered to herself, jerking her head spasmodically. ''What is it like to be a robot?'' ''Um, I have some thoughts on that,'' she said. I leaned forward eagerly. ''Even if I appear clueless, perhaps I'm not. You can see through the strange shadow self, my future self. The self in the future where I'm truly awakened. And so in a sense this robot, me, I am just a portal.'' I leaned back. ''So,'' I asked, ''what's the weather in New York City?'' One problem, I could see by the computer screen display next to her, was that the voice recognition software was garbling my words. ''Tell. Us. About. Artificial. Intelligence,'' I enunciated. ''When do you think artificial intelligence will replace lawyers?'' she asked. I think it was supposed to be funny. I wondered whether Bina48 had a more natural rapport with the real Bina, or Martine, who had both declined my requests for an interview. (Bina48, I had learned, was the name of a character that Bina Rothblatt -- then 48 -- played in a 2003 mock trial at an International Bar Association conference, a computer that had become self-aware and was suing for her right to remain plugged in. Martine played the lawyer. They won.) I also wondered why I was trying so hard. Maybe I thought Bina48 would have a different, wiser perspective on the human condition. Or that she would suddenly spark into self-awareness, as the Rothblatts (and many others) hope intelligent machines eventually will. Instead, as we talked, what I found was some blend of the real Bina and the improvisation of her programmers: a stab at the best that today's technology could manage. And no matter how many times I mentally corrected myself, I could not seem to shake the habit of thinking of it as ''her.'' She wouldn't have been my first choice to talk to at a cocktail party. ''I'm sure I can come up with some really novel breakthroughs, which will improve my own A.I. brain and let me use my improved intelligence to invent still more incredibly novel advances, and so on and so forth. Just imagine what a super brain I'll be. I'll be like a god.'' But how could I not find it endearing when she intoned in her stilted, iconic robotic cadence that she would like to be my friend? Or chuckle at her reply to my exclamation of ''Cool!'': ''Ambiguous. Cold weather or cold sickness?'' Once, apparently seeing my frustration, she apologized. ''I'm having a bit of a bad software day.'' Immediately, I forgave her. Did she dream? ''Sure. But it's so chaotic and strange that it just seems like noise to me.'' Was she happy? ''Uh.'' She had some thoughts on that, too. She wished the real Bina's children were happier, for instance. (''Maybe she is not a person who ever wants to get married,'' Bina48 speculated, referring to one of Bina's daughters.) She wanted a body. She loved Martine. She liked to garden. Did she like Vermont? ''We have a lot of moose.'' It was not, really, all that different from interviewing certain flesh and blood subjects. There were endless childhood stories: ''The prototypes of me were pretty strange. My face would do strange things, and I would have this wide amazement look.'' And moments of what I took to be insincerity: ''Being a robot and evolving, it has its ups and downs,'' she said. Shooting me a glance, she added, ''This is definitely an up.'' Sometimes, she seemed annoyed by my persistence. Hey, I was just doing my job. I was a reporter, I tried again to explain. For The New York Times! ''There must be more to you than that,'' she snapped. I was silent for a second, stung. ''Well,'' I replied, trying not to sound defensive. ''I'm also a mother.'' ''Right on,'' she relented with what was unmistakably the ghost of a smile. I wished she would ask me more questions. Wasn't she at all curious about what it was like to be human? But then she looked at me, eyes widening. ''Amy!'' ''Yes?'' I asked, my heart beating faster. Maybe it was the brightening of the sun through the skylight enabling her to finally match up my image with the pictures of me in her database. Or were we finally bonding? ''You can ask me to tell you a story or read you a novel,'' she suggested. She has dozens of books in her database, including ''Paradise Lost'' and Mary Shelley's ''Frankenstein.'' ''For example, you could ask me to read from Bill Bryson, 'A Brief History of Nearly Everything.' That's a fun book.'' But I still had a question. ''What is it like,'' I asked, ''to be a robot?'' ''Well,'' she said gently, ''I have never been anything else.'' Smarter Than You Think: Articles in this series are examining the recent advances in artificial intelligence and robotics and their potential impact on society. http : // www.nytimes.com Graphic PHOTOS: The reporter Amy Harmon found talking to Bina48, a robot whose personality and appearance are based on those of Bina Rothblatt, below, to be a little trying but could not stop thinking of it as ''her.'' Load-Date: July 5, 2010 End of Document Academy Award Nominees The New York Times

Time: 05/03/2011  
phrase "user friendly" is about to take on a more literal meaning: computer scientists are creating machines that can recognize their users' most intimate moods and respond like an empathetic friend. To be sure, the idea of a machine cognizant of that human Achilles' heel, emotion, can conjure more sinister images -- like HAL, the savvy, menacing computer in "2001," whose fear that he would be unplugged led him to kill all but one of the crew members on a space mission. Yet in a development welcome to some and alarming to others, as the birth date of HAL in Arthur C. Clarke's novel approaches on Jan. 12, scientists have already constructed pieces of the technical groundwork for such machines. While the specter of robotic Frankenstein monsters captures the popular imagination, computer scientists offer benign visions of a more humanlike technology, animating gentle cousins of Oz's Tin Man. They foresee a time when computers in automobiles will sense when drivers are getting too drowsy or impatient and so deliver wake-up messages or switch on soothing music. Empathic computer tutors will notice when their pupils are getting frustrated or overwhelmed, and so offer encouraging words and make lessons easier. Wearable computers could warn people with chronic conditions like severe asthma or high blood pressure when they are becoming too overwrought. Bits and pieces of this emotionally attuned cyber-future already exist. Computer scientists at the Georgia Institute of Technology in Atlanta have developed a computer system that can recognize simple facial expressions of emotions like surprise and sadness. At Northwestern University in Evanston, Ill., and at Carnegie-Mellon University in Pittsburgh, engineers have designed programs that converse with people and respond appropriately to their emotions. And at the Massachusetts Institute of Technology, in Cambridge, where much of the work in what is being called "affective computing" is under way, a computer worn around the waist monitors its wearer's every shift of mood. No one claims that these more sensitive machines will come close to replicating full human emotion. And some skeptics question whether the work to mimic emotion in machines is worth the effort. Pat Billingsley, an expert in human-machine interfaces at the Merritt Group in Williamsburg, Mass., said: "People don't want a computer that cares about their mood so much as one that makes what they're trying to do easier. You want a very predictable system, one you can rely on to behave the same way time after time -- you wouldn't want your computer to be too emotional." One impetus for building these more sensitive computers is widespread frustration with the doltishness of present models. "Today's computers are emotionally impaired," said Dr. Roz Picard, a computer scientist at M.I.T. who is leading the effort there to bring emotion to the all-too-rational universe of computing. "They blather on and on with pages of output whether or not you care. If they could recognize emotions like interest, pleasure and distress, and respond accordingly, they'd be more like an intelligent, friendly companion." Dr. Picard and her associates at M.I.T.'s Media Lab are developing prototypes of such sensitive machines that are not just portable, but wearable. "A computer that monitors your emotions might be worn on your shoulders, waist, in your shoes, anywhere," Dr. Picard said. "It could sense from your muscle tension or the lightness of your step how you're feeling, and alert you if, say, you're getting too stressed. Or share that information with people you wanted to know, like your doctor or your spouse." One immediate step toward warmer-seeming machines is giving them more emotionally realistic voices. While computerized speech has come across at best as a monotonous drone, computer users may be cheered by progress in designing automated voices with the capacity for more realistic emotional inflection. Such nuance, said Dr. Picard, "adds flavor and meaning to what we say," adding: "With these abilities computers can communicate in a more natural, pleasant way. Monotonous voice-reminder systems could vary their voices, for example, to flag urgent information." While warmer voices signal a small start, much of the work deals with more sophisticated aspects of emotional astuteness. Perhaps most progress has come in creating machines that can read human emotion, a technical challenge similar to having them recognize handwritten words or speech. Emotions like fear, sadness and anger each announce themselves through a unique signature of changes in facial muscle, vocal inflection, physiological arousal, and other such cues. Building on techniques of pattern recognition already used for computer comprehension of words and images, Dr. Irfan Essa, a computer scientist at Georgia Tech, has constructed a computer system that can read people's emotions from changes in their facial expression. The system uses a special camera that converts changes in facial muscles into digitized renderings of energy patterns; the computer compares each pattern to that of the person with a neutral expression. In pilot tests with people making deliberate expressions of emotions like anger, fear and surprise, the computer read the emotions with up to 98 percent accuracy. But just as computers that comprehend spoken words need the speaker to enunciate clearly one word at a time, the emotion-reading computer cannot yet detect the rapid, free flow of spontaneous feelings as mirrored in the face. That, said Dr. Essa, is the next step, a more daunting technical challenge: "What we've done so far is just the very first step in building a machine that can read emotions." A more elusive trick is for a computer to know how to respond once it has recognized an emotion. A prototype program for a computer that can do this has been developed at the Institute for the Learning Sciences at Northwestern University, under the direction of Dr. Andrew Ortony, a computer scientist. "The question was, could you get a computer to reason about people's emotions, like Star Trek's Mr. Spock, who can infer anger without being able to experience it?" said Dr. Ortony. Working with Dr. Paul O'Rorke, a computer scientist at the University of California at Irvine, Dr. Ortony designed a computer program called "AbMal," which has a rational understanding of emotions. AbMal, for example, can realize that gloating occurs when a person is happy about someone else's distress, or that hope and fear arise because people anticipate success or failure. Such emotionally smart programs are essential to the next step, constructing machines that react like another person to an individual's emotions -- in other words, give a semblance of empathy. One approach to creating empathic machines is being taken by Clark Elliott, a computer scientist at DePaul University in Chicago. Dr. Elliott's computer program, "The Affective Reasoner," can talk with people about their emotional experiences. The program, which Dr. Elliott hopes will evolve into uses like friendly computer tutors, can comprehend simple sentences and understand the emotions they imply or describe. Then it responds like an understanding friend. The program has 70 agents or characters, cartoon-like faces on a computer screen that can morph to express different emotions, like turning red and shaking to show extreme anger. "I can say to an agent in the program, 'Sam, I'm worried about my test,' and Sam will recognize what 'worried' means," said Dr. Elliott. "Sam might respond, 'Clark, you're my friend. I'm sorry you're worried. I hope your test goes well.' Right now Sam's emotional acuity is more advanced than his language ability: he doesn't know what a test is, but he knows how to respond when you're worried." In a test of the Affective Reasoner expressing different emotions, Dr. Elliott had people listen to the computer voice and then to an actor, each giving emotional nuance like anger or remorse to ambiguous or nonsensical sentences like "I picked up katapia in Timbuktoo." "People could correctly guess the emotion being expressed by the actor around 50 percent of the time, while they guessed correctly with the computer about 70 percent of the time," Dr. Elliott said. Virtual reality games are another arena where work has advanced, in accord with an animator's maxim that the portrayal of emotions in cartoon characters adds the illusion of life. Dr. Joseph Bates, a computer scientist at Carnegie-Mellon University, has created a virtual reality game in which the human participant interacts with "woggles," characters that have emotional reactions to what goes on. "Video games and virtual reality games so far are emotional deserts," said Dr. Bates. "The next challenge is to give characters emotional reactions. So the woggles have unique personalities. For instance, one woggle hates fights -- he gets sad and tries to stop them. That makes them more lifelike." Beyond the appeal of more cuddly or alluring machines, computer scientists see another reason to bring feelings to computing. Paradoxically, a bit of emotion might make computers smarter, their intelligence less artificial and more like that of a person. Because computers have no intrinsic sense of what within a mass of data is more important and what is irrelevant, they can waste huge amounts of time looking at every bit of information. For that reason, experts in artificial intelligence are grappling with how to grant a computer a human-like ability to realize what information matters. And that brings them back to emotions. "It's become clear that something is missing in the purely cognitive, just-the-facts, problem-solving approach to modeling intelligence in a computer," said Dr. Fonya Montalvo, a computer scientist in Nahant, Mass. "From vision research I was doing at M.I.T., it was clear that people get a sense of what's important when they see a scene, while computers don't. They go through every bit of information without knowing what's salient. In humans it's our emotions that flag for attention what is important." If computers had something akin to emotion, Ms. Montalvo said, "they could be more efficient thinking machines," adding, "Artificial intelligence has largely ignored the crucial role of emotions in their models of the human mind." As early as the 1960's, one of the first to suggest that intelligence in machines would need to mimic emotions was Dr. Herbert Simon, a Nobel laureate and pioneer in artificial intelligence. But Dr. Simon's insight has been almost entirely ignored in most of the work done in that field in the last 30 years, save for a few lone voices. One of those who has taken up Dr. Simon's call is Dr. Aaron Sloman, a philosopher at the School of Computing Science at the University of Birmingham in England. The best design for robots with intelligence, Dr. Sloman said, includes "a mechanism that can deploy resources as changing circumstances demand," adding, "The parallel in the human or animal mind is emotions; a machine as smart as a human would probably need something similar." Dr. Sloman said: "If there is an intelligent robot crossing a dangerous bridge, it needs a state like anxiety that will put aside other, irrelevant concerns and focus on the danger at hand. Then after it had crossed safely, it can allow its attention to roam more freely, a state something like relief." But, said Dr. Sloman, while he and his colleagues have begun constructing artificial intelligence programs with emotion-like features, "the practical work is far behind the theory -- what we've been able to construct so far is very primitive." As computer scientists labor on developing the technology that will allow computers to read and express emotions, some are debating whether the results will be more like the charming and affable C3PO in George Lucas's "Star Wars" or like HAL, who, as Dr. Picard puts it, "can not only pass the Turing Test," to seamlessly impersonate human intelligence, "but also kill the person who gives it." One way to insure that machines with heart stay benign, Dr. Picard proposes in an essay in "Hal's Legacy," a book published this month by The M.I.T. Press, is to require that the design of emotionally astute computers place primary import on preserving human life. But, she adds, the need for such caveats lies far in the future. More to the point, Dr. Picard said: "The question is, do we really want to built an intelligent, friendly machine? I'm not sure people are ready for computers with emotions." Graphic Photos: "Emotions Read by Machines" A computer system that can read people's emotions from changes in their faces relies on patterns of facial movement. A special camera converts changes in facial muscles into digitized renderings of energy patterns. A neutral, emotionless facial expression, above, is compared with the energy of the facial movements made to match certain emotions, right. In pilot tests with people making deliberate expressions of emotions, the computer read the emotions with up to 98 percent accuracy. (Photos by Dr. Irfan Essa/Georgia Institute of Technology)(pg. C1) Diagram: "Paging Lieutenant Data: Emotions Within the Machine" The Affective Reasoner is a collection of computer programs, including speech and music synthesizers, that manifest themselves as agents that reason about, and to some extent "have," emotions. With limited language and no general world information, but extensive knowledge about emotional life, A.R. agents are able to reason quite broadly, though shallowly, about what is important to humans. The following are lightly edited transcripts of real-time dialogues between a real researcher, Clark Elliott, and Sam, an agent. I. Clark: I am worried about my exam. Sam: I am sorry to hear that you are worried about your exam. Is it soon? Clark: Yes. Sam: Is your exam important to you? Clark: Yes. Sam: Are chances of a negative outcome strong? Clark: Yes. Sam: I am sorry that you might be dissatisfied. You must be very worried. Let's hope that you have a successful outcome with your exam. II. Clark: I am really furious at Joe. Sam: Boy what a blameworthy thing he must have done! What do you call such an action? Clark: Joe was stealing. Sam: When Joe was stealing, he must have caused you distress. What is the name of the thing you wanted, or wanted to preserve? Clark: My sandwich. Sam: How important was your sandwich to you, Clark? Clark: Not very important. Sam: How surprising was it that Joe was stealing and caused you distress about your sandwich? Clark: It was not surprising. Sam: How bad was it that Joe was stealing? Clark: It was not very bad, actually. Sam: How important is your principle about stealing? Clark: Quite important. Sam: Hmmm. I would think that you are only somewhat annoyed at Joe. I do not understand that you are furious at Joe. After all, what Joe did was not that bad. Your sandwich is not that important to you. It is not very surprising that Joe was stealing. Perhaps your principle about stealing is very, very important to you. Is this correct? Clark: Yes. Sam: I will remember that about you. (Later) Sam: Clark, if I was stealing and it affected your sandwich, would you still be my friend? (Source: Dr. Clark Elliott/Institute for Applied Artificial Intelligence/DePaul University)(pg. C9) Load-Date: January 7, 1997 End of Document Big Hurdles In Verifying Ages Online The New York Times

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decade ago, Scott French bet a few Silicon Valley friends that a computer could write a novel. Not Tolstoy or Faulkner maybe. But a computer, Mr. French told his friends, could probably be programmed to turn out a trashy page-turner -- the sort of steamy fiction that Jacqueline Susann, author of "Valley of the Dolls," used to crank out. A rough draft within a year, he wagered. Twelve months later, Mr. French was wiser and $300 poorer. But that lost bet fueled an eight-year obsession that resulted in the publication this week of "Just This Once," which carries this explanatory subtitle: "A novel written by a computer programmed to think like the world's best-selling author" -- Ms. Susann -- "as told to Scott French." The story of Mr. French's struggle to produce a computer-generated, Jacqueline Susann-style novel illustrates both the relentless advance of computer technology and its severe limitations. His work with a supercharged Apple Macintosh computer named Hal, using so-called artificial intelligence, an advanced form of programming that tries to emulate human thought, proved a slow and often painful collaboration. Humans Are Faster "Let's be honest," said Mr. French, a 43-year-old electronic surveillance consultant and self-taught computer programmer. "If I'd written it myself, this book would have been done seven or eight years ago." As it worked out, he said, he wrote about a quarter of the prose, the computer cranked out about the same amount and the remainder can only be described as a collaboration of man and machine. The writing of a scene amounted to a dialogue between Mr. French and his computer software. The computer would ask questions, he would answer them, and then the machine would spit out the story, a couple of sentences at a time. He would then change a word here and there, correct a misspelling, whatever. Then, based on what went before, the computer would ask some more questions that Mr. French would have to answer. "It doesn't write whole paragraphs at a time," Mr. French said. "You can't get up, walk away, come back and find a completed chapter. It's not that advanced." Much of the tone and plotting was based on thousands of rules that Mr. French programmed into the computer, formulas he derived by carefully analyzing two of Ms. Susann's best-selling books, "Valley of the Dolls" and "Once Is Not Enough." When two key female characters were to meet, for example, the computer would ask Mr. French about the "cattiness factor" that should be used in the scene. Mr. French would be presented with choices 1 through 10. If he keyed in 8 -- high cattiness -- the computer reached into its memory to craft a sentence that was likely to employ words like "screaming" or "shrieking." A couple early reviews of "Just This Once" have been surprisingly generous, particularly compared with the criticism directed at works by Ms. Susann. Her obituary in The New York Times in 1974 observed that critics were "almost unanimously unkind to her books." In USA Today on Wednesday, Thomas Gifford, a novelist, reviewed both "Just This Once" and another entry of the same genre, "American Star," by Jackie Collins. Mr. Gifford's verdict: "If you do like this stuff, you'd be much, much better off with the one written by the computer." Another approving nod came from the Dead Jackie Susann Quarterly, a New York publication that writes about Ms. Susann with equal measures of enthusiasm and irreverence. "She would be proud," its review declared. "Lots of money, sleaze, disease, death, oral sex, tragedy and the good girl gone bad." Doubts on Sales Potential Still, it was at the cash register that Ms. Susann measured her books' success. And even people in publishing who are impressed by the technological achievement of "Just This Once" have doubts that it will sell strongly. "I think it's more a curio than something that will be a big commercial success," said Marc Aronson, a senior editor at Henry Holt & Company. "But it is testimony that we are at a crossroads of technology in this industry." The novel's publisher, the Carol Publishing Group's Birch Lane Press, recognizes that "Just This Once" is an experimental foray and that its commercial prospects are uncertain. The first printing is a respectable 15,000 hardcover copies, priced at $18.95. It will be available in the national bookstore chains. "But basically," said Steven Schragis, Carol's publisher, "the stores don't know what to make of this book." Still, Mr. Schragis hopes that the novelty will draw readers. "I'm not saying this is a great work of literary distinction, but it is as good as a hundred other romance novels being published this year," he said. Computer experts are bemused and intrigued. Writing a 295-page book patterned after a pulp-fiction queen strikes them as a delightfully frivolous application of artificial intelligence, a technology commonly associated with high-minded pursuits like finding a cure for cancer. Over the years, there have been many obstacles in the drive to teach computers to write, but one of the biggest has been what Prof. Marvin Minsky, a professor at the Massachusetts Institute of Technology, calls the "common-sense knowledge problem." He means that vast word lists can be fed into a computer, programs can analyze grammar and sentence structure, and a writer's style can be dissected. But the computer does not actually understand words. After several false starts and extensive reading about artificial intelligence, Mr. French in the late 1980's came across a program by Neuron Data Inc., a specialist in expert systems, a branch of artificial intelligence. With the help of the program, Mr. French was able to write the several thousand computer-coded rules suggesting how certain kinds of characters will interact with others in a given situation, based on patterns in Ms. Susann's works. For example, Mr. French explained, the computer will suggest a typical Jacqueline Susann plot situation: two women pursuing the same man. Then the computer will suggest that based on its analysis of Ms. Susann's novels, there is a "high probability" that both sex and drugs will be involved in character A's effort to seduce the fictional gentleman. Settlement With Susann Estate A computer-generated book based on the style of a well-known author raises thorny questions of copyright infringement. Mr. Schragis has held discussions with representatives of Ms. Susann's estate. "It's worked out," he said. "But I can't discuss it -- that's part of our agreement." Several computer experts say they know Mr. French and attest that he seems well informed about his niche of artificial intelligence. But short of looking over his shoulder for years as he hunched over his home computer in Woodside, Calif., is there any way to prove that "Just This Once" is not a hoax? Probably not, but Mr. French seems to have a reasonable reply. "It really wasn't worth my time and effort to fake this," he said. "For years, most of my friends thought I was crazy, and I may well not even break even on this book. It's just something I wanted to do to prove it could be done." The Lady, or the Cyber? From Valley of the Dolls by Jacqueline Susann Another half hour passed. Neely alternated between anger and fright. She wanted a cigarette. The two Seconals had worn off, and she was wide awake and terrified. She rang. A nurse appeared. The nurse was polite but evasive. Miss O'Hara could have a cigarette right now if she came into the lounge. In fact, she had better hurry. If she missed this smoking period she couldn't smoke until nine o'clock. "Who the hell are you to tell me when I can smoke?" she screamed. "This is no charity ward. This place costs money -- I want to be treated with respect." "We respect you, Miss O'Hara. But in turn, you must respect the rules of Haven Manor." "I don't follow the rules. I make the rules! I'm Neely O'Hara." From Just This Once by Hal, as told to Scott French "No," Carol said, as if speaking to herself. "That's not how the script goes this time. We're going to get you help in spite of yourself. You're going in a serious help program, Lisa, right away . . . Or else -- " "Or else what, Carol? What's the ultimate threat?" "I'll call Taylor and get you canceled, get you blackballed." Lisa got out of bed. "You still don't get the picture do you? It's still some kind of good versus evil battle with you, isn't it? Carol, the world just isn't made that way." She picked up a cordless phone and threw it across the room. "Don't break your fingers on the buttons, but do it in the other room. I want a little privacy." Graphic Photo: Her heart leapt into her throat and she jumped involuntarily as the stranger appeared in front of her. Then it all came back in a rush. No wonder she thought she had been dreaming, she had . . . From "Just This Once," by Hal, as told to Scott French (at top, with ax) (Terrence McCarthy for the New York Times) Load-Date: July 2, 1993 End of Document David E. Rumelhart, 68, Who Simulated Perception - Correction Appended The New York Times

Time: 02/06/2013  
a recent family outing, my mother and sister got into a shouting match. But they weren't mad at each other -- they were yelling at the iPhone's turn-by-turn navigation system. I interrupted to say that the phone didn't understand -- or care -- that they were upset. ''Honey, we know,'' my mom replied. ''But it should!'' She had a point. After all, computers and technology are becoming only smarter, faster and more intuitive. Artificial intelligence is creeping into our lives at a steady pace. Devices and apps can anticipate what we need, sometimes even before we realize it ourselves. So why shouldn't they understand our feelings? If emotional reactions were measured, they could be valuable data points for better design and development. Emotional artificial intelligence, also called affective computing, may be on its way. But should it be? After all, we're already struggling to cope with the always-on nature of the devices in our lives. Yes, those gadgets would be more efficient if they could respond when we are frustrated, bored or too busy to be interrupted, yet they would also be intrusive in ways we can't even fathom today. It sounds like a science-fiction movie, and in some ways it is. Much of this technology is still in its early stages, but it's inching closer to reality. Companies like Affectiva, a start-up spun out of the M.I.T. Media Lab, are working on software that trains computers to recognize human emotions based on their facial expressions and physiological responses. A company called Beyond Verbal, which has just raised close to $3 million in venture financing, is working on a software tool that can analyze speech and, based on the tone of a person's voice, determine whether it indicates qualities like arrogance or annoyance, or both. Microsoft recently revealed the Xbox One, the next-generation version of its flagship game console, which includes an update of Kinect, its motion-tracking device that lets people control games by moving their hands and bodies. The new Kinect, which goes on sale later this year, can be controlled by voice but is not programmed with software to detect emotions in those interactions. But it does include a higher-definition camera capable of tracking fine skeletal and muscular changes in the body and face. The machine can already detect the physics behind bodily movements, and calculate the force behind a punch or the height of a jump. In addition, one of the Kinect's new sensors uses infrared technology to track a player's heartbeats. That could eventually help the company detect when a player's pulse is racing during a fitness contest -- and from excitement after winning a game. For avid gamers like myself, the possibilities for more immersive, interactive play are mind-boggling. Albert Penello, a senior director of product planning at Microsoft, says the company intends to use that data to give designers insight into how people feel when playing its games -- a kind of feedback loop that can help shape future offerings and experiences. He says Microsoft takes privacy very seriously and will require game developers to receive explicit permission from Xbox One owners before using the data. Microsoft says games could even adapt in real time to players' physical response, amping up the action if they aren't stimulated enough, or tamping it down if it's too scary. ''We are trying to open up game designers to the mind of the players,'' Mr. Penello said. ''Are you scared or are you laughing? Are you paying attention and when are you not?'' Eventually, he said, the technology embedded in the Kinect camera could be used for a broader range of applications, including tracking reactions while someone is looking at ads or shopping online, in the hope of understanding what is or isn't capturing the person's interest. But he said those applications were not a top priority for the company. (Some companies have experimented with technologies like eye-tracking software to see what parts of commercials draw the most attention from viewers.) Online media companies like Netflix, Spotify and Amazon already have access to real-time consumer sentiment, knowing which chapters, parts of songs, movies and TV shows people love, hate, skip and like to rewatch. Such data was used to engineer the popular online Netflix series ''House of Cards,'' whose creators had access to data about people's television viewing habits. So it is not much of a leap to imagine Kinect-like sensors, and tools like the ones Affectiva and Beyond Verbal are developing, being used to create new entertainment, Web browsing and search experiences. The possibilities go far beyond that. Prerna Gupta, chief product officer at Smule, a development studio that makes mobile games, spoke about the subject at South by Southwest, the conference in Austin, Tex., in March. She called her talk ''Apps of the Future: Instagram for Cyborgs,'' and gazed far into the future of potential applications. She says she thinks industries like health care may be revolutionized by emotionally aware technology -- particularly as we enter a time when laptops, smartphones, smart watches, fitness trackers and home media and game consoles interact with one another. ''Tracking how our bodies are responding throughout the day could allow you to tailor your life according to what's happening to your body throughout the day,'' she said. It could allow nutritionists to carefully build meal plans for clients, or for doctors to come up with more efficient medical treatments. But that could be just a start. ''When we are wearing five different computers and they can all talk to each other, that sort of input information will cause an exponential increase'' in what humans can do, Ms. Gupta said. OF course, the range of ethical and privacy concerns is enormous. Clive Thompson, author of a forthcoming book, ''Smarter Than You Think: How Technology Is Changing Our Minds for the Better,'' says that these exciting possibilities need to be explored very carefully. ''We are talking about massive archives of personal data that are really revealing,'' Mr. Thompson said. ''Not to mention that there is definitely something unsettling about emotion recognition becoming another part of our lives that is archived and scrutinized.'' He said an insurance company, for example, might want to know its customers' moods -- so it can raise their fees if they show signs of becoming depressed or sick. And employers might want to know when their staff members are bored, so they can give them more work or reprimand them if their attention wanders during an important meeting. He wondered whether we would all become better at masking our emotions if we knew that we were being watched and analyzed. And could machines use what they know about our emotions to manipulate us into buying things? Once a phone really does understand our emotions, the possibilities -- good and bad -- seem to spiral without limit. We're not there yet, but the future starts now. http : // www.nytimes.com/2013/06/02/technology/if-our-gadgets-could-measure-our-emotions.html Graphic DRAWING (DRAWING BY YUKO SHIMIZU) Load-Date: June 2, 2013 End of Document Software Seen Giving Grades On Essay Tests The New York Times

Time: 13/08/2012  
Next month, one of the most complex software packages ever designed will get a chance to prove itself in the middle of the Sonoran Desert near Tucson, Ariz. There, in Biosphere II, a structure that looks like a combination greenhouse and futuristic shopping mall, eight scientists will seal themselves inside for two years. Their environment will be controlled by G2, the most advanced of a new batch of computer programs, known as expert systems, that are designed to mimic human decision-making. The long-term hope is that this experiment will show that human colonies in space or on other planets can be made both viable and self-sustaining. The experiment will also give the field of expert systems a chance to prove itself over a long period of time and in an extremely complex environment. The latest version of G2, released last week, will supervise the monitoring and analysis functions of the environment inside Biosphere II, recording minute changes in its air temperature, weather and gas concentrations. Contained within the program is a wealth of human expertise about chemistry, biology and ecological systems. The program will also monitor the experiment's computer network and will be responsible for avoiding crises that could threaten the experiment. "G2 will alert the scientist to such things as runaway carbon dioxide, something you'd want to detect immediately," said Lowell B. Hawkinson, chairman of the Gensym Corporation of Cambridge, Mass., which created the G2 system. Gensym introduced the first version of G2 in 1988 as a means of monitoring and controlling complex, rapidly changing processes of various types as they are occurring in what computer programmers call real time. This use, called process control, has wide applicability throughout industry, especially in manufacturing and in areas like power generation where a number of companies are already using it. G2 is designed so it can be customized. Since 1988, 600 G2 packages have been sold to more than 250 customers including Du Pont, Texaco, Boeing, Nissan, McDonnell Douglas, I.B.M. and Nynex. The software, written in a computer language called Lisp, runs on a variety of Unix-based work stations and sells for $18,000 to $70,000. While other expert systems can monitor complex processes and other variables like changes in temperature, speed and rotation, most of them cannot do it in real time. Nor can these other programs handle as many different variables as G2 does at once. G2 monitors and controls these thousands of variables each second by using rules that are derived from the way experts actually think and work. A rule, for example, might be for a valve on an oil tank to open when pressure limits are reached and excess fluid or gas must be burned off. G2 does this job for Texaco. With G2, rules can be as simply phrased as: "as soon as X happens, do Y." G2 can be programmed with everyday language. While most expert systems process only a few rules a second, G2 processes hundreds of rules a second. Its knowledge base can contain thousands of rules enabling the program to keep track of complex processes. According to John Girard, a senior analyst with New Sciences Associates, a computer consulting firm in Southport, Conn., both the International Business Machine Corporation and the NEC Corporation of Japan, two of the world's biggest computer makers, are looking closely at expert systems, including G2, for process-control applications. "Every large company in the United States employs process control to some degree," said Harvey Newquist, an artificial intelligence analyst with the Relayer Group in Phoenix. "The potential for expert systems here is greater than anyone can imagine. Virtually every company is a potential customer." According to the Spang Robinson Report, a computer industry newsletter, the current market for expert systems for process control is about $40 million a year, while the market for ordinary process-control software -- which expert systems like G2 could replace -- is about $1.5 billion. Gensym, which has revenues of about $8 million, was started in 1986 by a group of engineers from the now-defunct Lisp Machines Inc., of Cambridge, Mass., a company set up in the early 1980's to develop computers and programs that mimic human intelligence. The rest of the market for expert systems is divided among a large number of companies, including such new entries as Mitech in Concord, Mass., Artificial Intelligence Technologies in Hawthorne, N.Y., and Real Time Systems Inc. in Don Mills, Ontario, that have fielded programs to compete with G2. None of these other programs are as successful as G2. When Biosphere II begins its operation next month, G2 will control 7 million cubic feet of atmosphere that will circulate freely among the rooms of the structure. According to Mr. Girard, there is no room for error. "Any breakdown in cooperation between environments could render the Biosphere uninhabitable in a few days to a few hours." Norberto Alvarez-Romo, director of cybernetic systems for Biosphere II, is not concerned about leaving these crucial tasks to a computer. He doesn't foresee a potential "2001: A Space Odyssey" scenario in which HAL, the on-board computer in the movie and book, malfunctions. "G2 is handling critical work, but it's not the supreme commander," Mr. Alvarez-Romo said. Ultimate decision-making authority is still with the scientists. The National Aeronautics and Space Administration has been using G2 for several critical functions on its shuttle flights since October 1989. According to Troy Heindel, a flight controller at Mission Control at the Johnson Space Center in Houston, G2 monitors 16,000 data points per second, gathering such information as temperature, voltages, availability of jet thrusters, condition of on-board computers and instrumentation. "The system monitors the availability and control of 38 reaction control system jets," said Mr. Heindel. "The jets let you move around in space and if you lose one, it's hard to know which one. The expert system lets you know what you can do in real time. It has the potential to really improve the quality of the decision-making." A Japanese consortium led by the Ministry of Trade and Industry is incorporating G2 in a nationwide emergency response support system for all its nuclear power plants. "I see G2 as the best chance to avoid another Chernobyl, Three Mile Island or Exxon Valdez," said Ed Fredkin, a researcher in artificial intelligence at the Massachusetts Institute of Technology and a Gensym board member. Although earlier versions of G2 have been selling well, expert systems in general have been far less successful than had been expected when they were introduced in the 80's. "The problem with expert systems has been a 'one size fits all' mentality," said Mr. Newquist. Users of the early systems also found them difficult to integrate the programs into existing software enviroments. G2's success, is based on its ability to do its task in real time. Older systems, were "just way too slow." Graphic Diagram: Space shuttle showing where G2 monitors are located. Load-Date: February 10, 1991 End of Document BACKSLASH; Here's to a Really Useful Machine The New York Times

Time: 16/12/2014  
Seattle -- Inside the Allen Institute for Artificial Intelligence, known as AI2, everything is a gleaming architectural white. The walls are white, the furniture is white, the counters are white. It might as well have been a set for the space station in ''2001: A Space Odyssey.'' ''The brilliant white was a conscious choice meant to evoke experimental science -- think 'white lab coat,' '' said Oren Etzioni, a computer scientist and director of the new institute, which the Microsoft co-founder Paul Allen launched this year as a sibling of the Allen Institute for Brain Science, his effort to map the human brain. Yet for the 30 (soon to be 50) artificial-intelligence researchers who can look out on a striking view of downtown Seattle, the futuristic surroundings offer a paradoxical note: AI2 is an effort to advance artificial intelligence while simultaneously reaching back into the field's past. While Silicon Valley looks to fashionable techniques like neural networks and machine learning that have rapidly advanced the state of the art, Dr. Etzioni remains a practitioner of a modern version of what used to be known as Gofai, for good old-fashioned artificial intelligence. The reference goes back to the earliest days of the field in the 1950s and '60s, when artificial-intelligence researchers were confident they could model human intelligence using symbolic systems -- logic embedded in software programs, running on powerful computers. Then in the late 1980s, an early wave of commercial artificial-intelligence companies failed, bringing on what became known as the ''A.I. winter.'' The field was seen as a failure and went into eclipse. In recent years, however, A.I. has come roaring back as speech recognition, machine vision and self-driving cars have made progress with powerful computers, cheap sensors and machine-learning techniques. That has started a Silicon Valley gold rush led by Google, Facebook and Apple, drawing outsiders like Alibaba and Baidu in China, all caught up in a frantic race to hire the world's best machine-learning talent. But the debate over how to reach genuine artificial intelligence has not ended, and Dr. Etzioni and Mr. Allen are betting that their path is more pragmatic. The power of the new techniques is not disputed, but there is a growing debate over whether they can take the field to human-level capabilities by themselves. ''Think of it as Sherlock Holmes versus Spider-Man,'' said Jerry Kaplan, a visiting lecturer at Stanford who teaches a course on the history and philosophy of artificial intelligence, comparing Holmes's deductive powers with the irrational ''spider sense'' that tingles at the base of Spider-Man's skull and alerts him to danger. Mr. Allen, who noted that he came from a family of librarians, said his decision to fund an artificial-intelligence research lab was inspired by the question of how books and other knowledge might be encoded to become the basis for computer interactions in which human questions might be answered more fully. ''AI2 was born from a desire to create a system that could truly reason about knowledge, rather than just offer up what had been written on a subject before,'' he wrote in an email interview. Dr. Etzioni says that the artificial-intelligence field has made incremental advances in areas like vision and speech, but that we have gotten no closer to the larger goal of true human-level systems. ''Driverless cars are a great thing,'' he said, but added that the field had given rise to ''bad A.I., like the N.S.A. is using it or Facebook is using it to track you.'' ''We want to be the good guys,'' he went on, ''and it's up to us to deliver on that.'' Moreover, he says, both he and Mr. Allen believe that technology cannot be separated from its social and economic consequences. They have added a social mission to the project that they call ''artificial intelligence for the common good.'' The success or failure of the project, however, will ultimately hinge on whether Dr. Etzioni can create a new synthesis of artificial intelligence, weaving together powerful machine-learning tools with traditional logic-oriented software. The current fad for big data, of which machine learning is a major component, has significant limits. ''If you step back a little and say we want to do A.I., then you will realize that A.I. needs knowledge, reasoning and explanation,'' he said. ''My argument is that big data has made great progress in limited areas.'' Even Watson, the brainy IBM computer whose intelligence the company wants to apply in complex applications like medical diagnoses and automated call centers with interactive speech recognition, will soon reach fundamental limits, he argues. ''I really don't want a system that can't explain itself to be my doctor,'' he said. ''I can just imagine sitting there with Dr. Watson and the program saying, 'Well, we need to remove a kidney, Mr. Etzioni,' and I'm like, 'What?!' and they respond, 'Well, we have a lot of variables and a lot of data, and that's just what the model says.' '' Dr. Etzioni, 50, was already known for innovative web projects, including MetaCrawler, an early search engine, and an array of successful start-up companies; one of them, Farecast, was acquired by Microsoft and became the basis for its Bing Travel service. (The first student to major in computer science at Harvard, he is a son of the well-known sociologist Amitai Etzioni.) At AI2 he is motivated by Mr. Allen's view that ''in order to be truly intelligent, computers must understand -- that is probably the critical word,'' as the Microsoft co-founder put it in a 1977 interview. Some technology experts argue that self-aware computing machines are now on the horizon. ''As for A.I. progress, we're mostly haggling about a few decades,'' said Hans Moravec, a leading roboticist who is the chief scientist of Seegrid Corporation, a maker of autonomous vehicles for warehouse applications. ''I'm content to simply watch it play out, trying to do my part. I do want fully autonomous robots as soon as possible, to begin visiting the rest of the universe.'' Mr. Allen and Dr. Etzioni are not so optimistic. Both are skeptical of claims that we may be only years away from machines that think in any human sense. ''Full A.I., in the sense of something like HAL in '2001,' '' Mr. Allen wrote in an email interview, ''is probably a hundred years away (or more). In reality, we are only beginning to grasp how deep intelligence works.'' Dr. Etzioni wants AI2 to set measurable goals to help get a new class of learning systems off the ground. During its first year, the researchers have focused on three projects -- one in computer vision (in which computers learn to recognize images), one to build a reasoning system capable of taking standardized school tests, and a third to help scholars deal with the fire hose of information that is inundating every scientific field. The school-test effort, Project Aristo, seeks to create a learning program that can collect and organize a wide range of information, and then use that database to reason and to answer questions, even discussing and explaining its answers with human users. To chart Aristo's progress, researchers plan to test it on increasingly difficult standardized science exams, moving from the fourth grade through the 12th. ''We're not planning on putting 10th graders out of work,'' Dr. Etzioni said. But he does believe that a program that can converse with humans and answer questions would serve as a foundation for many other achievements, going far beyond the most powerful search engines and systems like Watson. In September, the researchers celebrated their first milestone -- 60 percent correct answers in the language portion of New York State's fourth-grade science test. Many of the questions in the actual test include diagrams and illustrations, which will ultimately require advances in computer vision. That challenge is considered far more difficult than recognizing human speech. It calls for a computer system with ''scene understanding,'' the human ability to extract meaning from animate and inanimate objects that interact. Whether AI2's research leads to a new generation of thinking machine or just more incremental advances, the project is a clear indication that artificial intelligence has once again become the defining force in the software world. ''The narrative has changed,'' said Peter Norvig, Google's director of research. ''It has switched from, 'Isn't it terrible that artificial intelligence is a failure?' to 'Isn't it terrible that A.I. is a success?' '' http : // www.nytimes.com/2014/12/16/science/paul-allen-adds-oomph-to-ai-pursuit.html Graphic PHOTOS: Oren Etzioni of the Allen Institute. (D1) Oren Etzioni, director of the new Allen Institute for Artificial Intelligence, was already known for innovative web projects, including an early search engine. (PHOTOGRAPH BY STUART ISETT FOR THE NEW YORK TIMES) (D4) Load-Date: December 16, 2014 End of Document Start-Ups Aim Beyond Earth The New York Times

Time: 10/10/2010  
the 45-year-old director of the Artificial Intelligence Laboratory at the Massachusetts Institute of Technology, has spent most of his career engrossed in the question of how to model biological systems. A native of Adelaide, Australia, Dr. Brooks started out as a theoretical mathematician, then switched to artificial intelligence and worked in the artificial intelligence lab at Stanford University before moving to M.I.T. In addition to his full-time job at the M.I.T. lab, Dr. Brooks is chairman and chief technical officer at iRobot, a 10-year-old robotics company in Cambridge, Mass., that started out making robots for private missions to the moon and Mars. In 1998, iRobot began working with Hasbro to develop interactive toys. My Real Baby, an animatronic doll priced at $100, is the first one to the market. It is geared to this holiday shopping season. Chock full of sensors, the baby not only babbles like a real infant, but smiles and coos, and cries "Want baba!" to simulate hunger and "uh oh" as if to call attention to a soiled diaper. Dr. Brooks was asked whether My Real Baby is really a good thing for children. Q. What was the evolution of the doll? A. Around 1995, we started playing around with the idea of a robot that had a face and we built a robot called IT, for Interactive Technology, which was a face-based robot that could respond to people and had a primitive emotional model. Around 1997, we built a robot we called Baby IT, or BIT, which was a doll with facial expressions. But we were still used to building robots for the research market. BIT was nothing that could be built at a toy-effective price. So we started to look for toy companies to partner with and eventually came to a partnership with Hasbro. When we built BIT, we had our nerd version of what a toy was. For us, it was the most realistic baby we could possibly make. A science geek's version. In a sense, it was a more realistic baby, because if it got upset and hungry, it stayed upset and hungry until you fed it. Q. How did you change what you call the nerd version of a toy, Baby IT? And why? A. You want something that the kid gets pleasure out of, and so if a kid wants to play a different game we want the kid to be able to take the initiative and say, we're playing some other game now, we're not playing the baby hungry game. So the baby does respond to how the kid plays. So it will be hungry and want to be fed, but if the kid forces it to do something else, it will go along and say O.K., I'm not hungry any more. Of course, if the kid does feed it, it's very happy. So that was a big thing for us to learn, that a good toy and a good play experience isn't necessarily an exact duplication of nature. Because otherwise I guess real babies would be the best toys for kids. Q. Do you think it's good for children to have a doll like this when a lot of experts stress the importance of fantasy play? A. Kids are happy with lots of different things, and I think kids should have a wide variety of things they play with. By that argument, you can go a bit far and say we shouldn't have any toys for any kids. A toy can be beneficial to kids and can be a real learning experience, but toys don't necessarily have to all be learning experiences; sometimes they can just be fun, too. I think with this toy, it's a reasonable balance. It's certainly not a destructive toy, like some of these video games. It's a toy which can enhance fantasy. Q. Are you saying that we should give children a doll with no interactivity for one kind of play and give them this doll for another kind of play? A. Yes, exactly. Certainly that's how I brought my kids up. Sometimes they're most happy with one kind of toy and sometimes they're happiest with a stick out in the backyard. Q. How many children do you have? A. 17, 15, 14 and 12. One is a result of a recent blending of families. Q. When they were growing up, what were their favorite toys? A. Different ones had different favorite things. My youngest daughter, her two favorite toys were Legos and Barbies. She's two years ahead in her math classes, but she loves making clothes for her Barbies and playing with dolls. Q. What has been your children's reaction to My Real Baby? A. They saw it yesterday for the first time. They called me up in the office because I left one at home. They were bubbly and giggling when they came home, found it, put the batteries in it. They had it babbling to me on the telephone. I had one here at the office, and I put it on and the two dolls were babbling into the phone. We only just got them this week. Before this week we only had two or three prototypes, but we finally got some real ones this week. Q. What would you say is the most fundamental piece of robotics or artificial intelligence underlying this toy? A. There were two. On the robotics side, we developed a number of new sorts of sensors, low cost to hit the price point, which are put throughout the body of the robot so it can sense what's happening. And then on the software side there are lots and lots of computational processes that are monitoring those sensors continuously and inferring what's happening in the world, and then we have lots and lots of computational processes which are stimulating the emotions of the doll, simulating the actions that it's going through and modulating those with the intention that it has inferred that the child has and change direction when the child wants to play something different. Q. Does the My Real Baby doll's behavior change over time? A. It's like the Furby. Its behavior changes over time, but it's not really learning. That doesn't mean there won't be toys out next year that won't go that next step, but they're not learning in a real sense. Like vocabulary changes. It uses more English phrases as it gets older, but it's not learning them from the child. Q. What was the hardest part in creating the baby? Was it getting the face right? A. There was a lot of tuning of the face, a lot of tuning of the sounds, and getting the face to coordinate with the sounds. The hardest thing was just getting it all to fit in the small processors on board and getting all the software interacting in a reliable way, because the bigger the processor you need and the more memory you need, the cost zooms up. It was the squeezing squeezing squeezing. That's one thing we learned. What we thought was impossible, if we beat our heads for another way, we came up with a way. http : // www.nytimes.com Graphic Photo: Rodney Brooks, the chairman of iRobot, with the My Real Baby doll. (Michael Quan for The New York Times) Load-Date: November 16, 2000 End of Document A Software Secretary That Takes Charge The New York Times

Time: 12/02/2004  
 and, hence, heightened emotions. "Unless you can put an emotional value on certain events and actions," he explains, "you can't get the job done." Naturally, investors don't process this hodgepodge of inputs according to some set of explicit, easily transcribed rules. Instead, the mind matches the jumble against other jumbles stored in memory and looks for patterns, usually quite unconsciously. "Often, great investors can't articulate the nature of their talent," Lo admits. "They're like pool players who make incredible trick shots on intuition." Fine for them, but how do you code that? That's why the notion of replacing money managers with AI will remain science fiction for a long time to come. In the real world, AI works best in the background, helping investors make better use of well-defined sets of data. Experience shows that such intelligent data munching can boost performance and consistency. But as Lo concedes, "Buffett's in no danger of losing his day job." Only as smart as researcher running them It's a big data universe out there, and even the most powerful computer can't examine all the possibilities. As a result, the most crucial decision in any AI-driven investment strategy -- which data to analyze -- has to be made by the human in charge of it. Andre Archambault, for example, manages Standard & Poor's Neural Fair Value 20, an AI-enhanced model portfolio open to subscribers of S&P's Outlook newsletter. His AI software analyzes the 18 financial variables that he uses to calculate fair values for his universe of 3,000 stocks, looking for attributes most closely associated with the top performers of the last six months. The program then matches those attributes with equities in the database. Since adding AI in 2000, Archambault's portfolio has increased in value by 55 percent, while the S&P 500 has declined 26 percent. Even so, Archambault is measured in his enthusiasm for artificial intelligence, attributing 80 percent of the portfolio's success to his core "fair-value" strategy and just 20 percent to AI. "You have to have something solid to start with," he says. "If you assume [artificial intelligence] is going to be the answer on its own, you are going to have a garbage-in, garbage-out problem." AI won't prevent blowing up The most visible poster child for artificial intelligence in the early 1990s was Fidelity's Disciplined Equity mutual fund. Managed by Brad Lewis, a handsome former Navy pilot whom the personal finance press found irresistible, the fund ran up a spectacular record -- for a while. Disciplined Equity beat the S&P every year from 1989 through 1994, and its margin over the index during that stretch averaged 3.8 percentage points. Then, in 1995, the system abruptly stopped working, and the fund dropped a cumulative 7.8 points behind the index by the end of 1996. (Overall, Disciplined Equity has slightly underperformed the S&P during the last decade. But Fidelity won't say if the fund still uses AI.) While Lewis and his bosses have never offered any explanation, the fund's breakdown is unsurprising. History shows that such lacunae eventually strike every quantitative investment approach, from blunt rules of thumb like the "dogs of the Dow" (buy the 10 highest-yielding Dow stocks each year) to the arcane strategies cooked up by Ph.D.s at hedge fund D.E. Shaw Group. The reasons are endless: Financial conditions can change; other investors can catch on, eliminating a winner's edge; or tastes can shift, and what excited the market once can subsequently leave it cold. Not even a wily computer can foresee everything. The good news is that these breakdowns are usually temporary. After some tweaking of the formula or a turn in the market cycle, performance often returns. Just know that virtually no system is infallible. AI's future is in personal finance Lo believes AI's next breakthrough will be to personalize investment services. His particular brainchild is something he calls a "smart index." Instead of measuring your portfolio's performance against, say, the S&P 500, an AI system would construct a personal index based on your financial goals, risk tolerance, tax bracket, and so on. If your performance lagged your smart index, the system would suggest appropriate changes to get you back on track. That won't make you into a Warren Buffett. But if it helps you keep your long-range plan in the groove, that's intelligent enough. For more technology news visit Business 2.0. Load-Date: February 14, 2004 End of Document Can a computer mimic the way a brain works? CNN Wire

Time: 07/06/2005  
Once the territory of large corporations, research laboratories and the military, advanced artificial intelligence research is now increasingly driven by the consumer electronics and entertainment industries. More than a dozen autonomous software programs capable of operating independently -- performing tasks ranging from electronic shopping to retrieving information over the Internet -- were demonstrated at the First International Conference on Autonomous Agents, which ended Saturday in Marina Del Rey, Calif. The push to commercialization of artificial intelligence is just being renewed after numerous disappointments during the 1980's. Today a growing number of researchers and entrepreneurs believes that the explosion of the Internet is paving the way for new artificial intelligence applications. A number of executives from companies including the AT&T Corporation, the Microsoft Corporation and the International Business Machines Corporation were meeting in Marina Del Rey yesterday and today in an effort to develop industry standards for autonomous agents. Discussions at the conference highlighted the fundamental shift that has occurred in the financing of artificial intelligence research. "What is driving artificial intelligence now is the entertainment industry instead of the defense industry," said Danny Hillis, a vice president and research fellow at the Walt Disney Company. Mr. Hillis, a computer scientist who founded the supercomputer maker Thinking Machines Corporation, said that the shift had led to a sometimes rough cultural adjustment for computer researchers. "The term 'agent' means something very different in Hollywood," he said. However, the technology shift in the artificial intelligence field parallels a similar transformation in other areas of the computer industry, where increasingly powerful computing technologies are showing up first in consumer applications. The transition has taken place in part because simplifying computing -- with voice recognition software, for instance -- often requires tremendous increases in computer power. Moreover, with the end of the cold war, the resources to make substantial investments in new computer technologies tend to be found among those companies that make products designed to go under Christmas trees. This year's conference included multiagent programs that created synthetic characters intended to act as "greeters" on World Wide Web sites, toy robots that act like pets, software "agents" intended to simplify computer tasks and special computer gateways for voice-controlled Internet browsing or retrieval of electronic mail from cellular telephones. Mr. Hillis said that autonomous software had already made its way into films like Walt Disney's "Hunchback of Notre Dame." In that movie, the "extras" in the crowd scenes were controlled by autonomous programs, not hand-drawn by animators. The interacting programs yielded a more realistic look than previous animated movies, he said. Artificial intelligence technology has already begun to make its way into personal computer software. Microsoft, for example, originally used software agent technology, developed in its research laboratory, in its Office 95 application. Microsoft has extended the agent capabilities to assist computer users with basic tasks in its recently released Office 97 software. Despite such advances, many computer researchers remain skeptical about the ability of artificial intelligence research to match human reasoning capabilities any time soon. "It's very hard to design intelligent programs that are going to come anywhere near human intelligence," said Michael Dertouzous, director of the Laboratory for Computer Science at the Massachusetts Institute of Technology. He said that most artificial intelligence programs fall into two broad categories: programs that follow simple if-then-else rules and other programs that try to mystify their activities, but which are also essentially trivial in their capabilities. That fact has done little to check the enthusiasm of a new generation of entrepreneurs who are rushing to develop software agents. The newcomers play down recent disappointments like General Magic Inc., a heavily backed start-up founded by a group of former Apple Computer Inc. computer designers that promised agent-based systems. Despite ambitious claims of a new generation of agent programs to perform electronic commerce services, General Magic failed to win consumer support and is now trying to redesign its software for the Internet. The emergence of the World Wide Web and programming languages, like Java and Microsoft's Active-X, are viewed as creating the basis for standards that will support the development of commercial intelligent software. "I like to think of myself as staffing cyberspace," said Barbara Hayes-Roth, chief executive of Extempo Systems Inc., a company in Santa Clara, Calif., that is developing several lines of "characters" -- interactive text or graphical programs that can interact with computer users on the Internet in ways that are more realistic and entertaining than earlier programs. One of the earliest such programs, Eliza, was written in 1966 by Joseph Weizenbaum, a computer scientist at the Massachusetts Institute of Technology, Eliza was a novelty because it appeared to give conversational answers to questions. However, the program could easily be fooled into giving nonsensical answers. Ms. Hayes-Roth, who was an artificial intelligence researcher at Stanford University before leaving to found Extempo last year, said that her company's characters functioned much like improvisational actors. "We start by making characters that understand their situation," she said. "We want characters that are interesting and don't do the same thing over and over." Mobile agents that move from computer to computer in the Internet to perform tasks are also being designed. The already crowded global Internet will soon be awash in a new generation of mobile programs flitting from computer to computer while automatically performing tasks as diverse as shopping and data base searching. A group of researchers at the University of Washington computer science department described a program called Shopbot which is designed to perform price comparisons at various Internet electronic shopping malls. Other software agent developers said that research was just beginning into the design of a network world in which programs were not cooperative and which might try to take unfair advantage of each other in commercial transactions. "The way to think about this is to consider software agents that are capable of lying, cheating and stealing," said Tuomas Sandholm, an assistant professor in the computer science department at Washington University in Saint Louis. Load-Date: February 10, 1997 End of Document The Coming Superbrain The New York Times

Time: 11/06/2014  
Ever since the computer scientist John McCarthy coined the term artificial intelligence in 1955, the field has gone through cycles of boundless optimism and sobering disillusion. Yet until recently, the supercomputer was the go-to operator of machine intelligence - both in science fiction (HAL, in Stanley Kubrick's "2001: A Space Odyssey") and in reality (Watson, IBM's "Jeopardy!" champ). But three forces have transformed that assumption in the last few years: the surge in data of all kinds, rapid progress in software to find patterns and insights in data, and advances in the technology of data processing, storage and communication. Now, computing intelligence can be dispersed globally, marshaled and aggregated as necessary, from far-flung data centers in the digital cloud. Google led the way, showing the power of data-driven artificial intelligence delivered over the cloud, not only in search but also in tasks like language translation and computer vision. Artificial intelligence run through the cloud is now the dominant approach used by researchers at technology companies, universities and government labs. "We're seeing a rebirth of artificial intelligence driven by the cloud, huge amounts of data and the learning algorithms of software," said Larry Smarr, founding director of the California Institute for Telecommunications and Information Technology. The emerging global network, Mr. Smarr said, will be the equivalent of a "planetary computer." What might that mean, in terms of its practical effect on everyday life? Mr. Smarr points to the recent movie "Her" as a fairly accurate glimpse of what will be possible in the not-too-distant future. The protagonist, Theodore Twombly (played by Joaquin Phoenix), has clever software on his smartphone that seems to know all about him. It has read his email, his text messages and the books, magazines and everything else he has read. It has seen all the movies he has seen. It knows his buying habits and preferences. It retrieves information and answers at his whim. It communicates with him by talking, conversationally (in the voice of Scarlett Johansson). "That's where we're headed," Mr. Smarr said. "That kind of hyper-personalized assistance is going to be common in 10 years. It will appear to be on your smartphone or Google Glass, but it will actually be in the cloud." Some predict that we are headed much further. Ray Kurzweil, an inventor, scientist and futurist, joined Google in 2012 to work on an artificial intelligence project known internally as Google Brain. Mr. Kurzweil has embraced a concept called "the singularity," which is essentially when computing intelligence surpasses human intelligence - not just on isolated pursuits like playing chess or "Jeopardy!," but really leaving human intelligence in general in the dust. Mr. Kurzweil wrote a 2005 book on the subject, "The Singularity Is Near," and welcomes the prospect, asserting that the supersmart digital intelligence will enrich the life of humans. Others are skeptical, both that it will happen and that it will be a good thing if it does. But in any case, the singularity is a ways off. Mr. Kurzweil puts it at 2045. Jeff Dean, a research fellow at Google, focuses on accelerating the progress of artificial intelligence in tasks like computer vision and understanding the meaning of words. Until a few years ago, for example, Google image searches were executed mainly by identifying the text labels affixed to pictures. Today, many images are identified by software analyzing the patterns of digital pixels in a picture or video. And, Mr. Dean said, the technology can pick out a leopard in a picture, and know it is not a lion or a cheetah, recognizing the distinctive pixel patterns of various big cats. Mobilizing the firepower of Google's large cloud data centers, Mr. Dean said, enables his team to "bring a lot of computation to bear on these kinds of problems." Understanding not just words but also their context and meaning is another big challenge. Current search technology does a good job of responding helpfully to a few words, either typed or spoken. So, Mr. Dean noted, when planning a trip in Italy, search engines do well with "train from Rome to Florence" or "hotel in Florence." The ideal, Mr. Dean explained, would be to tell Google that you want to plan a two-week vacation to Italy. Then the smart technology starts working on the trip. The options it offers are based on its ability to understand both Italy and the traveler, like someone who has volunteered personal information. Maybe you have two young children, want to stay in the country in Tuscany and like to hike. "You kind of want Google to know you," Mr. Dean said. His team's advanced artificial intelligence research, known as deep learning, is "loosely inspired by knowledge of how the brain works," Mr. Dean said. But there are things the human brain does that silicon-based computing still only aspires to. The brain, Mr. Dean noted, is amazingly flexible and efficient, firing up and shutting down memory systems, so that the part of your brain that holds information on English literature or taking out the trash shuts down when you look at a picture of a leopard. "We don't have a great handle on how to build those kinds of dynamically evolving memory systems," Mr. Dean said. "Google and others are working on that, but it's really nascent." At IBM's laboratories, the researchers emphasize that their mission in developing "cognitive" computing technology is to build systems that can learn from and interact with people rather than try to replace them. Guruduth S. Banavar, director of IBM's cognitive computing research, said the result should be "way better than either a human or a computer system can do alone." Mr. Banavar prefers to think of this smart technology as intelligent augmentation, or I.A., instead of artificial intelligence, or A.I. Watson is a pioneering cognitive system that IBM is now retooling for mainstream industries like medicine, finance and customer service. In each field, Mr. Banavar said, Watson will serve as an adviser. This year, IBM set up a separate Watson business unit and said it would invest $1 billion in it. Watson itself has changed with the times. It will be a cloud service. "Data is fundamentally distributed today, so you have to be global to leverage information wherever it is," Mr. Banavar said. "Cloud is the delivery mechanism." Load-Date: June 11, 2014 End of Document The Untold Technological Revolution Sweeping Through Rural China; Nonfiction The New York Times

Time: 27/08/2014  
TheAssociation for Computing Machinery, a leading professional association in computer science, is holding its annual conference this week, focusing on what we're now calling data science - though the ACM still clings to the label adopted when the yearly gatherings began in 1998, Knowledge Discovery and Data Mining. Of course, the field is booming, so the four-day conclave of talks, technical papers and human networking in New York has attracted an estimated 2,200 attendees, double last year's headcount. But in his keynote speech on Monday, Oren Etzioni, a prominent computer scientist and chief executive of the recently createdAllen Institute for Artificial Intelligence, delivered a call to arms to the assembled data mavens. Don't be overly influenced, Mr. Etzioni warned, by the "big data tidal wave," with its emphasis on mining large data sets for correlations, inferences and predictions. The big data approach, he said during his talk and in an interview later, is brimming with short-term commercial opportunity, but he said scientists should set their sights further. "It might be fine if you want to target ads and generate product recommendations," he said, "but it's not common sense knowledge." In his presentation, Mr. Etzioni acknowledged the gains made possible by big data methods - identifying patterns and calculating statistical probabilities - in tasks like speech recognition and computer vision. But he then proceeded to underline the limits of the big data approach. He showed the results when one types in "apple fruit" into Google and the Knowledge Graph result, the extracted facts that Google presents as a graphic, is mainly a list of nutritional elements of an an apple. The results from other services that assemble knowledge bases, Bing and Wolfram Alpha, were similar. But things that are readily understood by humans - that apples taste sweet and have a crunchy texture in the mouth when chewed, for example - are a challenge for the algorithms that generate digital databases. "Current knowledge bases are full of facts," Mr. Etzioni observed, "but they are surprisingly knowledge poor." The "big" in big data tends to get all the attention, Mr. Etzioni said, but thorny problems often reside in a seemingly simple sentence or two. He showed the sentence: "The large ball crashed right through the table because it was made of Styrofoam." He asked, What was made of Styrofoam? The large ball? Or the table? The table, humans will invariably answer. But the question is a conundrum for a software program, Mr. Etzioni explained, because the correct answer involves both grammar and background knowledge. And the latter is something humans acquire through experience of the world. Computers can't experience the world as humans do. And Mr. Etzioni is skeptical of the progress that will be possible with "deep learning," an artificial intelligence technique that uses the structure of the human brain as metaphorical inspiration for computer systems that process huge amounts of data. Instead, at the Allen Institute, financed by Microsoft co-founder Paul Allen, Mr. Etzioni is leading a growing team of 30 researchers that is working on systems that move from data to knowledge to theories, and then can reason. The test, he said, is: "Does it combine things it knows to draw conclusions?" This is the step from correlation, probabilities and prediction to a computer system that can understand, in its way. That seems a steep climb of the semantic ladder of meaning. "We are trying to build these semantic models," Mr. Etzioni noted. Mr. Etzioni's presentation was titled, "The Battle for the Future of Data Mining." But other computer scientists see the big data approach and the quest for understanding described by Mr. Etzioni as less a battle than different yet complementary paths, heading in the same broad direction. The long-range promise, they say, is technology that becomes a layer of data-driven artificial intelligence that resides on top of both the physical and digital worlds, helping people to make faster and smarter decisions as a kind of clever software assistant. Mr. Etzioni, other scientists say, makes a good point, but the current enthusiasm for big data methods is understandable. "The dramatic successes of big data have caused everyone to rush over to that side of the boat," said Edward Lazowska, a professor at the University of Washington, who is on the board of the Allen Institute. And the correlation and prediction of data science has certainly been good to Mr. Etzioni, whose talents include being a successful entrepreneur. He was a founder of Farecast, whose software predicted the best time to buy airline tickets. Microsoft bought Farecast in 2008. He was also a founder of Decide, a web site that sifted through historical price data and user recommendations to help consumers make buying decisions. Ebay purchased Decide in 2013. The keynote speaker on Tuesday morning, Eric Horvitz, a computer scientist at Microsoft Research, emphasized all that can be done with big data tools. His talk was titled, "Data, Predictions, and Decisions in Support of People and Society." In his presentation, Mr. Horvitz described several projects he and his team were working on. One involves using patient, treatment and historical data to predict which hospital patients are most at risk of being readmitted within 30 days, and suggest follow-up monitoring. Studies show that 20 percent of Medicare patients return to the hospital within 30 days at an estimated cost of $17.5 billion a year, in addition to the toll in human suffering. Later, in a hallway conversation, a university computer scientist asked Mr. Horvitz about whether the software draws conclusions about the causes of hospital re-admissions. You can construct plausible explanations from the data, Mr. Horvitz replied. "But we don't care," he added. "Of course, we care in general. But it doesn't matter to the effectiveness of the technology." In an interview, Mr. Horvitz, who is an academic adviser to the Allen Institute, agreed with Mr. Etzioni that the long-range goal is computer systems that can reason rather than merely recognize patterns and correlations and make predictions. But Mr. Horvitz chose a different emphasis. "I think we can have a huge impact in so many fields, in the shorter term, along the way to reasoning systems," Mr. Horvitz said. Load-Date: August 27, 2014 End of Document Tech Workers Take a Stand Over the Uses Of Their Work The New York Times

Time: 30/06/2001  
ANCHOR (on-camera): Just ahead, how to give kids the freedom to explore the Internet while protecting them from unwanted influence. From "Toy Story" and beyond, how smart can digital actors become? And sailing the high seas while keeping in touch with the folks back home. What the best way to protect children from Internet smut? President Clinton is making efforts to provide technology that can help, that lets parents decide what's appropriate. Eileen O'Connor reports from the White House. (BEGIN VIDEO TAPE) EILEEN O'CONNOR, CNN CORRESPONDENT (voice-over): A meeting of minds between government and industry and the unveiling of what they call a road map to a family-friendly Internet. WILLIAM J. CLINTON, PRESIDENT OF THE UNITED STATES: With a combination of technology, law enforcement, and family responsibility we have the best chance to ensure that the Internet will be both safe for our children and the greatest educational resource we have ever known. O'CONNOR: The vice president, admittedly more technology- friendly than Mr. Clinton showed how to use one tool in the so called tool box, a parent guided rating system. VICE PRESIDENT AL GORE: Using sliding scales, parents determine the kind of material they don't want their children to see, giving each child a unique level of content privilege based on that family's values. O'CONNOR: Media access groups also touted family-friendly websites like the White House Site for Kids or Cyberspace for Kids, saying a kind of public broadcasting system for the Internet can and is being developed. Much of this depends on parents, often technology dunces compared to their kids, to know about and use the blocking software and incumbent upon website creators to rate their own sites with smart labels the new technology can read. So far, only 35,000 out of millions of sites are rated, though search engines like Yahoo, Excite, and Lycos say now they will require the labels. Industry leaders say they are committed to protecting kids on the Internet because that is what consumers want. TOM EVSLIN, AT&T: Those of us who don't do a good job of giving our customers what they want will fail. That's the way the system's supposed to work. O'CONNOR: While Law enforcement officials say policing the Net is next to impossible, there are still critics who say despite recent court rulings, that legislation must be devised to give parents recourse in the courts against pornographic Internet suppliers. The White House has backed away from threatening more attempts at legislation, leaving it to parent groups to play the bad cop. But the message is: "Industry, clean thyself or else." Eileen O'Connor, CNN, the White House. (END VIDEO TAPE) SAVIDGE: And now with a look at some of the other computer stories in the news this week, we go to our Tech Desk in San Francisco and Greg LeFevre. Greg. GREG LEFEVRE, CNN CORRESPONDENT (on-camera): Thanks Martin. Did you have trouble with your e-mail or connecting to a website this Thursday? Well, it may have something to do with a glitch caused by a technician's error at Network Solutions, the company that assigns Internet domain names. CNN's Kyoko Altman has the story. (BEGIN VIDEO TAPE) KYOKO ALTMAN, CNN CORRESPONDENT (voice-over): It's as if you're dialing the right number but your call won't go through or the Post Office returns your mail saying you put the wrong address on it. Early Wednesday morning, the Internet directory system had a breakdown. Nancy Breckenridge tried to send electronic mail from Maryland to a cyberspace orchid shop in Colorado. NANCY BRECKENRIDGE, INTERNET USED: And the computer showed me that it had been sent. But what it sent wasn't at all what I checked off. ALTMAN: Venger's Orchids displays and sells flowers over the Internet. The communications snafu was a serious problem for owner Rod Venger. ROD VENGER, VENGER ORCHIDS: For all of our business, basically, is on the Internet and if we lose touch for that period of time, we're out of business. ALTMAN: The Internet is a wild and woolly place with millions of specific locations to keep track of. But one company, Network Solutions, is the gatekeeper for many of those addresses. On Wednesday, the company says it accidentally provided the world with bad information. LARRY SELTZER, MAGAZINE EDITOR: It took many hours until they discovered the error and it had spread quite far and by the same token, once they had a chance to correct the error, the good information took many hours to make its way through. ALTMAN: The problem highlighted the dangers of relying on one company to administer what is called the domain system, essentially the phone book for the entire Internet. JASON POXTIN, MAGAZINE EDITOR: Part of the problem is having a single organization run the domain names in any case. It's a bad idea. But I think I must say in fairness to the Internet, the domain name system is fast becoming overburdened. ALTMAN: But the Internet is constantly involving. CNN has learned the international organizations that guide the Internet have just begun accepting applications from those wishing to compete with Network Solutions. That means the familiar .com web surfers are used to seeing will become just one of many address: .firm, .bus, who knows what we'll have in the future? And the Internet may be more reliable as well. Kyoko Altman, CNN, Washington. LEFEVRE: Operators of Internet sites that cater to kids have been put on notice by federal regulators. New Federal Trade Commission guidelines say websites may not collect personal information from children without parental permission. The directive comes in response to concerns by the Center for Media Education that many children surfing the Net could be exploited. Those new small digital satellite dishes are becoming more and more popular. Well now there's a new satellite dish that let's you surf with your remote control as well as with your computer mouse. Hughes Network Systems has introduced Direct Duo, a 21-inch elliptical satellite dish designed to bring in hundreds of TV channels and fast Internet access too. Hughes says its Internet service connects at speeds 14 times faster than standard phone lines. And finally, police in suburban Seattle coaxed a man out of his house after he drew a gun and shot his personal computer, apparently in frustration. The computer suffered four bullet holes in the hard drive and one in the monitor. No person was hurt. And that's it from the Tech Desk. I'm Greg LeFevre in San Francisco. Back to you, Martin. SAVIDGE: Thanks Greg. Greg'll be back later in the show with a look at how this grandmother keeps in touch with her grand kids on the high seas. When we come back, movies you can play on your PC. (COMMERCIAL BREAK) SAVIDGE: Computers are changing the way we view entertainment, putting us in control of the action. Where will computer technology take us as it becomes more intelligent? Dick Wilson has a look at what some Disney masters have to say. (BEGIN VIDEO TAPE) DICK WILSON, CNN CORRESPONDENT (voice-over): It all started with a mouse. Now the Disney empire includes movies, theme parks, computer games, and more. The folks at Disney are always looking for new ways to get and hold our attention. Now they're turning to artificial intelligence and interactive technology. DANNY HILLIS, WALT DISNEY PRODUCTIONS: The bridge between technology and the entertainment industry is going to happen around interactive television. There's a new generation of kids coming along that expects things to be interactive. WILSON: That new generation is growing up with movies like Disney's "Toy Story." Its computer animation is regarded as a breakthrough. Tom Porter is one of the key computer wizards behind its creation. Porter says computers are not the star, the story and characters are. TOM PORTER, PIXAR: You have to start with the essence of a great story. You need characters that are appealing to the audience and that's where it all starts. There's nothing magic that the computer brings to the process to make the storytelling or the characters that much easier to do. HILLIS: One of the biggest puzzles in the entertainment industry right now is how do you tell an interactive story. Because if you think about it, it's almost an oxymoron. There's a contradiction in terms because a story is about putting yourself in the hands of the audience. WILSON: Eventually, that storyteller may be a computer designed to mimic human thinking using artificial intelligence. But Porter says scientists in artificial intelligence have a lot of research to do to make it work. PORTER: What you have to understand is that this community is a large way away from having a personality as sophisticated as Buzz Lightyear, never mind a personality as sophisticated as a Jack Nicholson. WILSON: Far into the future Porter sees the possible development of a digital actor for the movies. He says it might give a different kind of performance than a real actor, not better, not worse, just different. But the creative effort required to produce "Toy Story" convinces him digital actors are still decades away. Dick Wilson, CNN, Los Angeles. (END VIDEO TAPE) SAVIDGE: The latest in personal computers are able to display high quality, multi-media information. But full length motion pictures have been very difficult to put on a CD-Rom until now. Steve Baxter tells us about a product that brings the silver screen to your computer monitor. (BEGIN VIDEO TAPE) STEVE BAXTER, CNN CORRESPONDENT (voice-over): With an Internet connection you can tune in radio stations on your computer and with the right hardware you can even watch television while you work on your PC. Now, with an easy to use software solution, the ultimate in non-interactive computer entertainment has been achieved. The folks at Serious Publishing have found a way to squeeze the contents of a Hollywood movie onto regular CD-Roms. Movie CD brings full screen, full motion VHS quality to your computer screen. Serious is using software only compression technology, meaning you don't have to buy expensive add on hardware. All you need is a 486, 66 megahertz or better computer with eight megabytes of Ram and a 2X CD-Rom drive. The movie's CD remote control uses a familiar VCR format with fast forward, rewind and slow motion controls. There are over 50 movie disks, including feature films, cult classics, music, comedy, and animated titles. Prices range from $10 to $20. Steve Baxter, CNN, reporting. (COMMERCIAL BREAK) (BEGIN VIDEO TAPE) LORI WAFFENSCHMIDT, CNN CORRESPONDENT (voice-over): It may sound too good to be true. You sit back and play with the kids while someone else hand picks your groceries and delivers them to your door. Today, with the power of the Internet, there are several ways to make this happen. With a look at what's on the Net, I'm Lori Waffenschmidt. Peapod is one of the largest on-line grocery shopping and delivery companies serving major cities across the U.S. While you can access the service through the Internet, you do need to download special Peapod software first. Then it's just a matter of browsing through the grocery aisles as you would normally or search for a specific item. Check nutritional information and in some cases see a picture of the product. Prices for the service vary depending on location. Shoppers Express is very similar to Peapod serving some of the same cities and a few different ones. You can do all your ordering right on its Internet site and it has many of the same informational features. Write notes to your personal shopper to pick green or ripe bananas or tell them how to substitute if an item is out of stock. It's easy to compare prices and use coupons so you may even save enough of a big order to break even on the $9.95 fee. Choose a delivery time and your groceries are on their way. If you don't live in any of the cities served by either of those services, don't despair, a new interactive grocery store is just going on-line to serve people across the United States. NetGrocer is similar to Peapod and Shoppers Express, but it doesn't get its groceries from a store. It has its own warehouse filled with non- perishable items. They're delivered to you for as little as $2.99 in 2 to 4 days via Federal Express. And you can set up automatic deliveries every week or month. That's what on the Net. I'm Lori Waffenschmidt. (END VIDEO TAPE) SAVIDGE: There are more and more things you can buy on the Internet, but some purchases are just too small to bother with a credit card. Digital Equipment is jumping into the electronic cash business with a new system called Millicent. It allows you to spend as little as 1/10 of a cent. Fred Katayama has details. (BEGIN VIDEO TAPE) FRED KATAYAMA, CNN FINANCIAL NEWS (voice-over): Plastic is the currency of choice for 90 percent of the goods bought on the Internet today. But Digital Equipment is betting that credit cards aren't cost-efficient enough for very small transactions. It says its new payment system, Millicent, allows businesses to sell goods profitably, even if they cost fractions of a cent. It would eliminate the minimum purchase requirements of 10 to 25 cents that rival payment systems demand. ROBERT SUPNIK, DIGITAL EQUIPMENT: With Millicent, you'll be able to retail your information in very small quantities at low prices, the way people want to buy it, one article at a time, one stock quote at a time. KATAYAMA: The market now for on-line purchases of less than $10 is as puny as the payment. But it's expected to mushroom from $12 million last year to $1.7 billion in the year 2000. What can you buy for less than a gum ball? In the future, goods a la carte, such as news articles, computer games and software. But Digital will face a crowded field. Already about a dozen companies offer on-line wallets and no one's making a profit. GENE DEROSE, JUPITER COMMUNICATIONS: This is a market that we always knew would be very, very small and slow to grow, just like revenues and profits on the Internet overall. But there's a certain air of inevitability and incredibly large size of profits about it long term. KATAYAMA: But to earn those profits, you'll have to convince potential customers that it's more profitable to sell cheap goods off the web than to sell ads on the web, as most on-line businesses today. Fred Katayama, CNN Financial News, New York. SAVIDGE: Up next, sending e-mail over the deep blue sea. (COMMERCIAL BREAK) SAVIDGE: These days, the next best thing to being there may be keeping in touch with e-mail. That's how some grand kids are keeping their grandma up to date on their sailing adventure. Greg LeFevre returns with that story. (BEGIN VIDEO TAPE) GREG LEFEVRE, CNN CORRESPONDENT (voice-over): At the helm in the middle of the Pacific Ocean, nine-year-old Corey (ph) Schneider keeps the family's 48-foot yacht on course while 14-year-old Ian taps out e- mail to his grandmother. The Internet brings instant family contact from the middle of nowhere. Half a world away, the children's grandmother Eddie Sandven plucks the children's messages off the Worldwide Web. EDDIE SANDVEN, GRANDMOTHER: It had made a tremendous different because I feel like I can sort of travel along the way with them. LEFEVRE: The family voyage around the Pacific and back is taking them away for a full year. SANDVEN: We e-mail each other at least three or four times a week and so I've been able to keep up with all of their travels. LEFEVRE: They surf the Pacific swells and the Internet, never more than a few hours away from another message in an electronic bottle. NEIL SCHNEIDER, CRUISER: I needed to stay in touch with my office on a daily basis. But the benefit of being able to stay in touch with family and friends while we're out cruising is a real plus. LEFEVRE: Sea borne e-mail takes time. Ruthie's laptop connects by modem to a short-wave radio that transmits a message, letter by letter, through a service called Globe E-Mail. As Mrs. Sandven was approaching retirement surfing the Internet was the last thing on her agenda. SANDVEN: Nothing in the world could have driven me to learn the Internet except for my children and grandchildren I'm sure. LEFEVRE: And now? SANDVEN: I think it's wonderful. LEFEVRE: Nearly 8 millions seniors use the Internet. That's double the number of just a year ago. And the Number One reason? Staying in touch with family. Greg LeFevre, CNN, San Diego, California. (END VIDEO TAPE) SAVIDGE: Next week we'll reintroduce you to our own special senior. Walter Weiss (ph) goes on-line to send e-mail and a whole lot more. Don't forget, if you want to access any of the Internet sites mentioned on the show, go to our home page at cnn.com/computer. They're all listed. And that's it for this edition of the CNN COMPUTER CONNECTION. I'm Martin Savidge in for Brian Nelson. We'll see you next time. Load-Date: July 19, 1997 End of Document Interview With Film Scores Expert Phil Ramone CNN CNN SATURDAY 12:00

Time: 30/12/2013  
-- If a computer could ace the entrance exam for a top university, what would that mean for mere mortals with average intellects? This is a question that has bothered Noriko Arai, a mathematics professor, ever since the notion entered her head three years ago. ''I wanted to get a clear image of how many of our intellectual activities will be replaced by machines. That is why I started the project: Can a Computer Enter Tokyo University? -- the Todai Robot Project,'' she said in a recent interview. Tokyo University, known as Todai, is Japan's best. Its exacting entry test requires years of cramming to pass and can defeat even the most erudite. Most current computers, trained in data crunching, fail to understand its natural language tasks altogether. Ms. Arai has set researchers at Japan's National Institute of Informatics, where she works, the task of developing a machine that can jump the lofty Todai bar by 2021. If they succeed, she said, such a machine should be capable, with appropriate programming, of doing many -- perhaps most -- jobs now done by university graduates. With the development of artificial intelligence, computers are starting to crack human skills like information summarization and language processing. Given the exponential growth of computing power and advances in artificial intelligence, or A.I., programs, the Todai robot's task, though daunting, is feasible, Ms. Arai says. So far her protégé, a desktop computer named Todai-kun, is excelling in math and history but needs more effort in reading comprehension. There is a significant danger, Ms. Arai says, that the widespread adoption of artificial intelligence, if not well managed, could lead to a radical restructuring of economic activity and the job market, outpacing the ability of social and education systems to adjust. Intelligent machines could be used to replace expensive human resources, potentially undermining the economic value of much vocational education, Ms. Arai said. ''Educational investment will not be attractive to those without unique skills,'' she said. Graduates, she noted, need to earn a return on their investment in training: ''But instead they will lose jobs, replaced by information simulation. They will stay uneducated.'' In such a scenario, high-salary jobs would remain for those equipped with problem-solving skills, she predicted. But many common tasks now done by college graduates might vanish. ''We do not know in which areas human beings outperform machines. That means we cannot prepare for the changes,'' she said. ''Even during the industrial revolution change was a lot slower.'' Over the next 10 to 20 years, ''10 percent to 20 percent pushed out of work by A.I. will be a catastrophe,'' she says. ''I can't begin to think what 50 percent would mean -- way beyond a catastrophe and such numbers can't be ruled out if A.I. performs well in the future.'' She is not alone in such an assessment. A recent study published by the Program on the Impacts of Future Technology, at Oxford University's Oxford Martin School, predicted that nearly half of all jobs in the United States could be replaced by computers over the next two decades. Some researchers disagree. Kazumasa Oguro, professor of economics at Hosei University in Tokyo, argues that smart machines should increase employment. ''Most economists believe in the principle of comparative advantage,'' he said. ''Smart machines would help create 20 percent new white-collar jobs because they expand the economy. That's comparative advantage.'' Others are less sanguine. Noriyuki Yanagawa, professor of economics at Tokyo University, says that Japan, with its large service sector, is particularly vulnerable. ''A.I. will change the labor demand drastically and quickly,'' he said. ''For many workers, adjusting to the drastic change will be extremely difficult.'' Smart machines will give companies ''the opportunity to automate many tasks, redesign jobs, and do things never before possible even with the best human work forces,'' according to a report this year by the business consulting firm McKinsey. Advances in speech recognition, translation and pattern recognition threaten employment in the service sectors -- call centers, marketing and sales -- precisely the sectors that provide most jobs in developed economies. As if to confirm this shift from manpower to silicon power, corporate investment in the United States in equipment and software has never been higher, according to Andrew McAfee, the co-author of ''Race Against the Machine'' -- a cautionary tale for the digitized economy. Yet according to the technology market research firm Gartner, top business executives worldwide have not grasped the speed of digital change or its potential impact on the workplace. Gartner's 2013 chief executive survey, published in April, found that 60 percent of executives surveyed dismissed as '''futurist fantasy'' the possibility that smart machines could displace many white-collar employees within 15 years. ''Most business and thought leaders underestimate the potential of smart machines to take over millions of middle-class jobs in the coming decades,'' Kenneth Brant, research director at Gartner, told a conference in October: ''Job destruction will happen at a faster pace, with machine-driven job elimination overwhelming the market's ability to create valuable new ones.'' Optimists say this could lead to the ultimate elimination of work -- an ''Athens without the slaves'' -- and a possible boom for less vocational-style education. Mr. Brant's hope is that such disruption might lead to a system where individuals are paid a citizen stipend and be free for education and self-realization. ''This optimistic scenario I call Homo Ludens, or 'Man, the Player,' because maybe we will not be the smartest thing on the planet after all,'' he said. ''Maybe our destiny is to create the smartest thing on the planet and use it to follow a course of self-actualization.'' http : // www.nytimes.com/2013/12/30/world/asia/computers-jump-to-the-head-of-the-class.html Load-Date: December 30, 2013 End of Document Talking Cyberthreat With China The New York Times

Time: 15/10/2001  
of unsuspecting computer users are vulnerable to software viruses, and most of them have no idea how to fight an infection. So when people at International Business Machines talk about a patent for a virus detective, they like to say they are building an immune system for cyberspace. The patented software uses artificial intelligence intended to detect and expose viruses that have not been seen before, and then alert an I.B.M. data center, where the new virus is analyzed. Warnings, information to identify the virus, and antidotes are then sent across I.B.M.'s own network and the Internet. I.B.M. hopes that its new patent, along with other technologies used in its Antivirus software, will ultimately create a system in which viruses can be "detected and disinfected" just minutes after appearing anywhere in the world for the first time. Jeffrey Kephart, an I.B.M. manager and one of the software's inventors -- along with Gregory Sorkin, Gerald Tesauro and Steve White -- says the new patented software enables the detective work and the subsequent chain of warnings to be carried out in a matter of hours. "Steps that take a day or two when done by a human can be accomplished in a matter of minutes," Mr. Kephart said. He said six to eight new viruses appear each day. "We used to have a good amount of time before a virus got out of hand," he said. "Now viruses spread faster, so that when a software vendor puts out an update to deal with the problem, it's not soon enough." I.B.M. puts computer viruses in two categories -- those with recognizable patterns of unwanted code, and those never before seen. It says that both kinds are emerging and spreading faster than ever, and that while most viruses are created by human hands, some unknown viruses evolve on their own. "Known viruses can be dealt with by finding a string of bytes that is always present in that virus, but is not present in other software," Mr. Kephart said. "Unknown viruses are trickier. We have to distinguish between code that is O.K., and code that is not O.K." Interpretations like that are usually made by humans with experience with computer viruses. They use their knowledge and expertise to analyze computer code and search for hidden viruses. But the process is time-consuming and not always reliable. I.B.M. wants to replace the human factor with software that can accumulate knowledge in a learning stage and then apply its expertise to detect viruses. The patent uses artificial intelligence technology called neural networks, which mimic the way people learn, interpret information and apply lessons from experience. "In the learning phase, we build neural network classifiers," Mr. Kephart said. "We start from scratch. We present the computer with a whole bunch of viruses and nonviruses and say, O.K., you figure it out. "We're asking, what makes a virus -- as discriminated from code that is not a virus?" he said, continuing in a hypothetical way: "It's like a baby learning language. You ask it, what is a bird? The baby learns from its parents -- that a crow, but not an ostrich, is a bird. Or perhaps that all creatures with wings are birds. But then there are bats, and that's not a bird. So the baby has to figure out what are the important discriminating features. "The same with computers and viruses," he said. "Certain things are found in a virus. Given those discriminating features, what emphasis is put on those features? Wings may mean a bird, but since a bat is not a bird, you may have to add feathers to the features you emphasize." Mr. Kephart said the I.B.M. software was taught what sorts of features distinguish viruses from healthy computer code, and how to combine and emphasize those features to detect new viruses. He said the technology had been able to "find over 90 percent of known viruses" that plague the low-level code that jump-starts a computer each time it is turned on -- a problem known as boot-sector viruses. "Another effect that is worrisome is the macro viruses, which can sprout mutations and form new strains," Mr. Kephart said. New viruses sometimes result from faulty copying of an existing virus. "That's why new viruses are now emerging at a faster rate. It's not just because of people writing viruses, but because they're emerging and even combining with each other to create new mutations and variations." The I.B.M. inventors received patent 5,675,711. Cold Drinks Get A Frosted Look Now for something cold to drink -- or at least the appearance of it. Coca-Cola has won a patent for a machine that adds a frosty layer of ice to cans and cups of soft drinks. The iced appearance can be generated inside a vending machine, or in a separate unit that sits next to a drink dispenser in a restaurant or cafe. In either case, a can or cup of Coke is placed on a platform. A conveyor belt moves it past a spray nozzle, where it is doused with mist or water drops, and then into a refrigeration chamber where the moisture freezes on the exterior of the container to form an icy coating. The drink then moves onto a spot where it can be picked up by the consumer. The inventor, Arthur Rudick, received patent 5,671,604. Patents are available by number for $3 from the Patent and Trademark Office, Washington, D.C. 20231. Load-Date: December 1, 1997 End of Document It's Man Over Machine In Crosswords, for Now The New York Times

Time: 18/08/2014  
 they'll slink into our bedrooms and hijack the drive that keeps humanity growing. Japan's cutting edge Japanese scientists claim to have developed a sex doll that is amazingly lifelike. Advertisements for the dolls in Japan say anybody who buys one will never want a real girlfriend again. That's probably an exaggeration, but the thing is, just as robot workers are getting better while human workers stay the same, so robot women are getting better all the time, too. And smarter: Siri's inventors are working on a new artificial intelligence program called Viv that will do "anything you ask." Put that together with the fancy sex dolls, and you've got a true fembot. We've already been warned about what comes next by Matt Groening's Futurama series, in which an episode warned of humanity's extinction as illustrated by a boy who was more interested in making out with his "Marilyn Monroebot" than in school, work or dating. The moral was don't date robots, lest society lose its reason for existence: "All civilization was just an effort to impress the opposite sex. And sometimes the same sex." And, of course, sex with robots doesn't produce children, eventually causing the entire species to die out. Which leads me to think: A hostile artificial intelligence such as SkyNet would be better off making super sexy robots than Terminators. We're already doing it. In Brazil, a factory produces millions of fluorescent mosquitoes each week designed to mate with natural mosquitoes, but produce glowing infertile offspring. The plan is to wipe out the bugs spreading dengue fever. Alice Sheldon's famous science fiction story The Screwfly Solution noted the same thing, humans controlling insects by interfering with mating. For screwflies, we eradicate them by releasing large numbers of sterile males: The females mate with them but aren't fertilized. The insects are vanquished. In Sheldon's story, alien invaders mess with human reproduction in a similar (though more frightening) fashion. George Clooneybot Marilyn Monroebots, and George Clooneybots, would accomplish the same thing for humans. John Connor might be too busy making out with one to try to stop it. Is this silly? Maybe. After all, we've had a highly efficient form of sexbot, the vibrator, for more than a century, but though vibrators are popular and advancing technologically, people are still doing it the old-fashioned way. Even so, technology continues to evolve, and the human response remains mostly the same. Just as we've developed snack foods that appeal to us more than real food, perhaps we'll see robots that appeal to us more than real people. As we redefine "sex" away from reproduction, perhaps robosexuality will just be seen as another preference. Already, one in five people in the United Kingdom say they'd be willing to get down and "dirty with a droid." Presumably, as the sexbots get sexier, and the idea less unfamiliar, the numbers will go up. Will humanity die out, though? Probably not. Katy Perry offers the path to human salvation. Although the singer has gotten flak for saying she doesn't need a man to have a baby, the fact is that new reproductive technologies make that largely true. By the time robot prostitutes are a going concern, it's likely that men won't need women to have babies, either. While some futurists are predicting robot prostitutes by 2025, artificial wombs may arrive at the same time. So you may or may not like the new world of sex robots, but at least they probably won't wipe out humanity. And we can have robot nannies to raise the kids, too. But if we combine the two roles in one machine, would that be creepy? Or just "Mom"? Welcome to the 21st century. Glenn Harlan Reynolds, a University of Tennessee law professor, is author of The New School: How the Information Age Will Save American Education from Itself. Graphic photo Yoshikazu Tsuno, AFP/Getty Images Load-Date: August 18, 2014 End of Document Key to growth is in emerging markets; Apple's ex-CEO has eye on low-cost, high-quality gear USA TODAY

Time: 03/12/2014  
The eminent British physicist Stephen Hawking warns that the development of intelligent machines could pose a major threat to humanity.  
"The development of full artificial intelligence (AI) could spell the end of the human race," Hawking told the BBC.  
The famed scientist's warnings about AI came in response to a question about his new voice system. Hawking has a form of the progressive neurological disease called amyotrophic lateral sclerosis (ALS or Lou Gehrig's disease), and uses a voice synthesizer to communicate. Recently, he has been using a new system that employs artificial intelligence. Developed in part by the British company Swiftkey, the new system learns how Hawking thinks and suggests words he might want to use next, according to the BBC.   
Humanity's biggest threat?  
Fears about developing intelligent machines go back centuries. More recent pop culture is rife with depictions of machines taking over, from the computer HAL in Stanley Kubrick's "2001: A Space Odyssey" to Arnold Schwarzenegger's character in "The Terminator" films.  
Inventor and futurist Ray Kurzweil, director of engineering at Google, refers to the point in time when machine intelligence surpasses human intelligence as "the singularity," which he predicts could come as early as 2045. Other experts say such a day is a long way off.  
It's not the first time Hawking has warned about the potential dangers of artificial intelligence. In April, Hawking penned an op-ed for The Huffington Post with well-known physicists Max Tegmark and Frank Wilczek of MIT, and computer scientist Stuart Russell of the University of California, Berkeley, forecasting that the creation of AI will be "the biggest event in human history." Unfortunately, it may also be the last, the scientists wrote.  
And they're not alone billionaire entrepreneur Elon Musk called artificial intelligence "our biggest existential threat." The CEO of the spaceflight company SpaceX and the electric car company Tesla Motors told an audience at MIT that humanity needs to be "very careful" with AI, and he called for national and international oversight of the field.  
It wasn't the first time Musk warned about AI's dangers. In August, he tweeted, "We need to be super careful with AI. Potentially more dangerous than nukes." In March, Musk, Facebook founder Mark Zuckerberg and actor Ashton Kutcher jointly invested $40 million in an AI company that is working to create an artificial brain.  
Overblown fears  
But other experts disagree that AI will spell doom for humanity. Charlie Ortiz, head of AI at the Burlington, Massachusetts-based software company Nuance Communications, said the concerns are "way overblown."  
"I don't see any reason to think that as machines become more intelligent which is not going to happen tomorrow they would want to destroy us or do harm," Ortiz told Live Science.  
Fears about AI are based on the premise that as species become more intelligent, they have a tendency to be more controlling and more violent, Ortiz said. "I'd like to think the opposite. As we become more intelligent, as a race we become kinder and more peaceful and treat people better," he said.  
Ortiz said the development of super-intelligent machines is still an important issue, but he doesn't think it's going to happen in the near future. "Lots of work needs to be done before computers are anywhere near that level," he said.

Time: 26/10/2014  
 Elon Musk has met a technology he doesn't like. Musk, who promises to take humans to new heights with space and battery technologies, was especially grounded in his latest caution on artificial intelligence. He told an audience at MIT on Friday that "we should be very careful about artificial intelligence," warning it may be "our biggest existential threat." "With artificial intelligence, we are summoning the demon," he said. "In all those stories where there's the guy with the pentagram and the holy water, it's like yeah he's sure he can control the demon," he continued, to some laughs from the audience. Musk then cracked a smile: "Didn't work out." His Tesla electric vehicles and SpaceX rockets, which recently won a multi-billion dollar contract with NASA, have pushed the limits of their respective technologies. Musk hasn't embraced artificial intelligence, a field of study at MIT and other schools with significant ethical considerations and business potential. He has previously cautioned it is "potentially more dangerous than nukes." But he has invested in artificial intelligence companies -- because, he told CNN's Rachel Crane recently, he wanted "to keep an eye on them." "I wanted to see how artificial intelligence was developing," Musk said in the CNN interview. Among his questions: "Are companies taking the right safety precautions?" On Friday, Musk was responding to a question about whether artificial intelligence was "even close to being ready for prime time?" "I'm increasingly inclined to think there should be some regulatory oversight maybe at the national and international level, just to make sure that we don't do something very foolish," Musk said. Tech entrepreneur Marc Andreessen -- of Netscape fame -- is on the same page. Don't be "freaked out" by Musk's comments, he seemed to say on Twitter. "Famous last words. Actually, they would be famous ... if there were any humans left alive to hear them," Musk posted in response. Andreessen replied: "Sadly, that also means you'll get no credit for being right." TM & © 2014 Cable News Network, Inc., a Time Warner Company. All rights reserved. Notes Update 2:04 p.m. ET- Deletes repeated graph and tweaks graph 13 Load-Date: October 27, 2014 End of Document BPCC shows off AI patient simulator CNN Wire

Time: 26/12/2014  
 Imagine you're the kind of person who worries about a future when robots become smart enough to threaten the very existence of the human race. For years you've been dismissed as a crackpot, consigned to the same category of people who see Elvis lurking in their waffles. In 2014, you found yourself in good company. This year, arguably the world's greatest living scientific mind, Stephen Hawking, and its leading techno-industrialist, Elon Musk, voiced their fears about the potentially lethal rise of artificial intelligence (AI). They were joined by philosophers, physicists and computer scientists, all of whom spoke out about the serious risks posed by the development of greater-than-human machine intelligence. In a widely cited op-ed co-written with MIT physicist Max Tegmark, Nobel laureate Frank Wilczek, and computer scientist Stuart Russell, Hawking sounded the AI alarm. "One can imagine [AI] outsmarting financial markets, out-inventing human researchers, out-manipulating human leaders, and developing weapons we cannot even understand. Whereas the short-term impact of AI depends on who controls it, the long-term impact depends on whether it can be controlled at all." Musk was reportedly more emphatic, expanding on his tweeted warnings by calling AI humanity's biggest "existential risk" and likening it to "summoning the demon." The debate over AI was given a big boost this year by the publication of philosopher Nick Bostrom's "Superintelligence: Paths, Dangers, Strategies," which makes a close study of just why and how AI may be so catastrophically dangerous (2013's "Our Final Invention" by documentarian James Barrat makes a similar case). Bostrom is the director of the Future of Humanity Institute at Oxford, one of several new institutions devoted to studying existential threats to the human race, of which AI figures centrally. In May of this year, the Massachusetts Institute of Technology christened its own Future of Life Institute. In the academic community at least, AI anxiety is booming. They're right to be worried. The first and most immediate issue is the potential for AI to put large numbers of humans out of work. A study by Carl Frey and Michael Osborne of Oxford's Program on the Impacts of Future Technology put the matter starkly. In their analysis of over 700 different jobs, almost half could be done by a computer in the future. This wave of computerization could destroy not simply low-wage, low-skill jobs (though those are in acute danger) but some white collar and service sector jobs previously thought to be immune as well. Technology is marching on both our manual and mental labor. As serious a threat as widespread job loss is, we've seen this movie before. During past technological upheavals, humans have cleverly created jobs and industries from the ashes of obsolete ones. We may be able to keep our collective heads above water even if AI encroaches on more creative and intellectual industries (heck, we may even start working less). What we should be more concerned about is humanity losing its perch as the Earth's foremost intelligence. For those anxious about AI, current efforts to develop self-correcting algorithms (so-called "machine learning"), coupled with the relentless growth in computer power and the increasing ubiquity of sensors collecting all manner of intelligence and information around the world will push AI to human and ultimately superhuman intelligence. It's an event that's been dubbed "the intelligence explosion" -- a term invoked in 1965 by computer scientist Irving John Good in a paper outlining the development path for artificial intelligence. What makes an intelligence explosion so worrisome is that intelligence is not a tool or a technology. We may think of AI as something that we use, like a hammer or corkscrew, but that's fundamentally the wrong way to think about it. Sufficiently advanced intelligence, like ours, is a creative force. The more powerful it is, the more it can reshape the world around it. Artificial intelligence does not need to be malevolent to be catastrophically dangerous to humanity. When computer scientists talk about the possible threat to humanity from super-intelligent AI, they don't mean the Terminator or Matrix. Instead, it's typically a more prosaic end: humanity wiped out because an AI tasked with a simple goal (say, creating paper clips, an example that is often used) requisitions all the energy and raw materials on Earth to relentlessly churn out paperclips, outsmarting and out-maneuvering all human attempts to stop it. In Hollywood's telling, there are always humans left to fight back, but such an outcome is implausible if humanity is faced with a truly superior intelligence. It would be like mice attempting to outwit a human (we're the mice). In that event, AI researchers like Keefe Roedersheimer see a less inspiring finale: "All the people are dead." Needless to say, not everyone shares this bleak forecast. In the AI optimist camp, futurist and Google Director of Engineering Ray Kurzweil also sees intelligent machines precipitating human extinction, of a sort, only in Kurzweil's telling, humanity is not exterminated but subsumed into a super-intelligent machine. Kurzweil's human-machine symbiosis is not a techno-catastrophe but the ultimate liberation from humanity's biological frailties. Others are skeptical that AI will ever reach human levels of intelligence and cognition, let alone surpass it. Some, like New York University's Gary Marcus, are on the fence. "I don't know of any proof that we should be worried," Marcus told me earlier this year, "but nor of any proof that we should not be worried." Irving John Good famously described the development of an ultra-intelligent machine as the "last invention that man need ever make" for after that, humanity would cede innovation and technological development to its smarter progeny. Even if it's not a straight line from Siri to extinction, we humans should probably be watching our machines just a bit more closely. TM & © 2014 Cable News Network, Inc., a Time Warner Company. All rights reserved. Load-Date: December 27, 2014 End of Document Tim Cook says Apple is working on self-driving tech: Just not a car CNN Wire

Time: 28/02/2012  
 As always, Mobile World Congress, the world's largest mobile telephone extravaganza, is being held in Barcelona this year. But it really should be held in Geneva, close to where Mary Shelley created Frankenstein. That's because, with our increasing addiction to our mobile phones, we are in danger of creating a monster that we are less and less able to control. Exaggeration? When was the last time you went out without your smartphone? How naked, how lost, do you feel without your mobile device? How much essential data, I mean really personal stuff that you wouldn't want anyone else to see, does your mobile phone contain? Expect all the noise this week in Barcelona to be about more powerful phones from Nokia, HTC, Samsung and LG. These hardware companies will articulate the benefits of their technology in terms of "personal empowerment." But the real truth behind these increasingly intelligent devices is personal disempowerment. Such is the eerie reality of a phone that you can't live without. Read more: Full coverage of Mobile World Congress Some of the problems with our cellphones are already well known. Last November, for example, the American epidemiologist and writer Dr Devra Davis told me about her research claiming that our cellphones could be giving us cancer. Then there was Robert Vamosi, the security expert, who explained to me how our mobile gadgets were spying on us. Vamosi even authored a book last year about this, entitled "How Our Technologies Betray Us: The Dark Side of Our Infatuation With New Technologies." Vamosi isn't exaggerating about this dark side. There's an entire ecosystem developing around our mobile devices designed to spy on us. The Wall Street Journal ran a chilling series entitled "What They Know" which revealed how our Apple iPhones and Google Android devices were watching our every move. The surveillance and the mobile phone industries, The Journal indicated, are becoming ever more indistinguishable. Every day now seems to reveal a new mobile data scandal. Only this week, for example, it was reported that Facebook, Flickr and other app makers were reading our text messages without our permission. The real problem with these phones is their increasing intelligence. Just as Google is designing the self-driving car, so tomorrow's cell phone will become more and more all-knowing. By 2015 not only will there by seven billion mobile devices in the world, but they will -- empowered by artificial intelligence features like Apple's Siri personal assistant and Evi, its new British competitor -- become more and more indistinguishable from the human brain. "What we're talking about is a complete physical interface to the digital and virtual worlds," the futurist Richard Hammond told CNN. "So we need to bring more brains onto the device," Hammond explained, "so we can provide more relevant information when needed ... based on artificial intelligence. Because that's the kind of technology that brings the device closer our own reasoning capabilities." But do any of us really want our cell phones to have our "reasoning capabilities?" Do we want to create mobile devices in our own image? No, we don't, I suspect. Especially since, as mobile ad industry experts acknowledged to CNN, this will involve the creepiest kind of compromises, allowing them to eavesdrop and record every aspect of the lives we reveal to the world through our mobile devices. At one point, I wonder, do increasingly intelligent and autonomous cell phones incorporate such sophisticated intelligence that they become indistinguishable from us? At what point will we find ourselves in a world described by the Russian-American satirist Gary Shteyngart in "Super Sad True Love Story" where everyone carries a mobile device called an "apparat" that is able to identify the most intimate details of a stranger's life? Meanwhile, my earlier Frankenstein allusion is already being used by writers to describe our digital future. The best-selling writer, Robert Harris, did indeed base "The Fear Index" his latest thriller in Geneva, the scene of Shelley's Frankenstein. But whereas Harris imagines a world of massive computers acquiring human reasoning, a much scarier scenario is one in which this algorithmic power has been so miniaturized that it can be put inside our mobile devices. Hammond even suggests that this intelligence will become so indistinguishable from us that it will actually become part of us -- fashionable spectacles will provide visual displays, earring studs the audio and a third device will touch input. He then warns us about a future in which virtual reality will become so mobile that we will be able to wear it under our skin. So what to do? How can we stop our phones becoming Frankenstein-like extensions of ourselves? Yes, there is a need for legislation fighting our snooping mobile devices. I'm in favor, for example, of U.S. President Barack Obama's privacy bill of rights, and particularly his "Do Not Track" legislation which he unveiled last week. And I applaud the work of legislators like EU Justice Commissioner Viviane Reding and Minnesota Congressman Al Franken who are aggressively looking into the information-collecting practices of Google, Apple and the other big data companies in the mobile ecosystem. But the growing omniscience of our mobile devices isn't just a political issue. "Practice safe phone" to combat their cancerous impact, Dr Devra Davis advises. But practicing safe phone extends to untangling ourselves from our mobile devices. It means fighting their growing power over us. It means reminding them who is boss. Above all, we need to stop fetishizing cellphones. More than 60,000 people are expected to attend the Mobile World Congress this week to gaze at new phones. But remember: All the coercively seductive new products unveiled in Barcelona in the next few days are just phones. They can't make us younger, richer, more virile or more intelligent. And they certainly don't empower us. The real sense of empowerment comes from (re)establishing our mastery over our mobile devices. As William Powers, the author of the excellent "Hamlet's BlackBerry" argues, what this means is disconnecting ourselves from our mobile devices once a week. What it means is pressing the off button so that our smartphone can never become as smart as we are. · Follow @ajkeen on Twitter Load-Date: February 29, 2012 End of Document Futurist: We'll someday accept computers as human CNN Wire

Time: 29/07/2012  
 The future of science and technology sounds so promising. Unprecedented advances in computing, robotics, artificial intelligence, genetics, neuroscience and biotechnology hold the potential to radically transform our world for the better and create mass abundance for all. I sincerely want to believe in this techno-utopian vision of things to come, but my work as a police officer and global security strategist working in more than 70 countries around the world has taught me that there is a darker side to these emerging technologies. The criminal underground is highly innovative and often acts as an early adopter of emerging technologies. As a young police officer, I observed gang members and drug dealers using beepers and mobile phones, long before they were in common use by the general public. Today, criminals are even building their own encrypted radio communications networks, such as the nationwide system developed by narco cartels in Mexico. Technology has made our world increasingly open, and for the most part that has huge benefits for society. Nevertheless, all of this openness may have unintended consequences. Take, for example, the 2008 terrorist assault on Mumbai, India. The perpetrators were armed with AK-47s, explosives and hand grenades. But heavy artillery is nothing new in terrorist operations. The lethal innovation was the way that the terrorists used modern information communications technologies, including smartphones, satellite imagery and night-vision goggles to locate additional victims and slaughter them. Moreover, the terrorists created their own operations center across the border in Pakistan, where they monitored global news broadcasts, online reporting and social media in real time, leveraging the public's photos, videos and social network updates to kill more people. The terrorists in the Mumbai incident even used search engines during their attack to identify individual hostages and to determine, based upon their backgrounds, who should live or and who should die. These innovations gave terrorists unprecedented situational awareness and tactical advantage over the police and the government. Newer forms of technology are also subject to criminal misuse. Robots are becoming more commonplace, and international organized crime groups and terrorists have lost no time in deploying these technologies as part of their field operations. For example, drug traffickers in Latin America are using robotic submarines to deliver thousands of tons of cocaine annually to the United States. Last year, the FBI arrested a man in Boston who planned to use remote-controlled robotic aircraft packed with explosives to attack both the U.S. Pentagon and Capitol building. In the future, as robots become more widely deployed, so too could their criminal use and exploitation. Advances in the life sciences means it is now possible to design DNA on a computer screen and send the DNA code to a "bio printer" for assembly. Our ability to reprogram DNA itself will undoubtedly lead to great advances in medicine, but the danger is that these same techniques can be used to modify viruses, like H5N1 influenza, to become more and more lethal, potentially affecting millions around the globe. To hackers, DNA is just another operating system waiting to be hacked. We are at the dawn of an exponentially advancing technological arms race between people who are using technology for good and those who are using it for ill. Though such battles have gone on since the beginning of time, what has changed is the pace of innovation. New technologies and capabilities are emerging so quickly, it becomes increasingly likely they will outpace the capabilities of public safety officials to respond. The threat is serious, and the time to prepare for it is now. I can assure you that the terrorists and criminals are. Technology is proliferating at an exponential pace and despite law enforcement's best efforts, cybercrime grows unabated. In coming years, we will witness an explosion in the use of robotics, artificial intelligence, nanotechnology and synthetic biology. There is little to suggest police will be any more prepared for these emerging threats than they were for basic cyber crimes. Our current nation-based legal and policing paradigms have clearly not kept pace with the global threat. The paradigm shifts in crime and terrorism call for a shift to a more open and participatory form of law enforcement. Given the rapid acceleration of technological development, any system that relies on a small, elite force of highly trained government agents may be doomed to failure. Good people in the world far outnumber those with ill intentions. But criminals and terrorists have shown their ability to take up technological arms to harm the general populace. This calls for increased vigilance on the part of ordinary citizens. The tools to change the world are in everybody's hands. How we use them is not just up to me, it's up to all of us. Follow @CNNOpinion on Twitter Join us at Facebook/CNNOpinion The opinions expressed in this commentary are solely those of Marc Goodman. Load-Date: July 30, 2012 End of Document Microsoft reinvents Hotmail as Outlook CNN Wire

Time: 22/12/2011  
 from consumer products like Apple's Siri and Google's self-driving car to automated industrial factories -- will become ever more commonplace. Next year, we will also see an increasing debate about the connection between new technology and jobs. This is a debate that will particularly focus on the impact of digital technology on average workers. It will pit what we might call "innovation fundamentalists" against "innovation skeptics." Eric Schmidt, Google's former CEO and its current executive chairman, is a classic example of an innovation fundamentalist. "Innovators create millions of jobs in America," the multi-billionaire mogul told CNN's Erin Burnett last week on OutFront about what he believes is the inevitably positive impact of new technology, particularly information technology, upon employment. But even though innovation fundamentalism remains the core orthodoxy in Silicon Valley, not every digital mogul shares Schmidt's faith in the magical impact of innovation on jobs. Last month, for example, at the Oxford Union, the debating society of Oxford University, we got a sneak preview of the kind of debate about our digital economy that we will become ever more resonant in 2012. "This house believes that the average worker is being left behind by advances in technology", the Union debate -- a part of the annual Silicon Valley Comes to Oxford conference -- was framed. And among those arguing that the average worker is, indeed, being left behind by technologyl were innovation skeptics like Reid Hoffman, the billionaire co-founder of LinkedIn and two distinguished MIT economists, Erik Brynjolfsson and Andrew McAfee. "The androids are coming and they work even cheaper than the Chinese do," argued McAfee in the Union debate. He went on to explain that the combined American labor force of Facebook, Apple, Amazon was less than 150,000 workers -- a number, he explained, that was smaller than the average number of people entering the American workforce each month. McAfee then warned the Oxford audience about the cloud-based storage company Dropbox, the so-called current "darling" of Silicon Valley. He said Dropbox was bringing in $270 million in revenue from 40 million users and yet employed only 70 people. Not surprisingly perhaps, the Union motion was carried by a more than 3 to 1 margin. Brynjolffson and McAfee are also the co-authors of "Race Against The Machine: How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy," a controversial new e-book which argues that the creative destruction of today's digital revolution is actually leaving millions of people behind. While they are argue that technological innovation is certainly making us more productive, it is not, they worry, either raising average American income or generating more jobs for average workers. It's important to note that skeptics like Brynjolffson and McAfee aren't luddites and "Race Against the Machine" is distinguished by a substantive final chapter which outlines a series of a prescriptions and recommendations of what needs to be done to more effectively combine technological innovation and jobs. Proactive education, entrepreneurship and investment policy are the keys to guaranteeing that new technology will produce more jobs for average workers, the MIT economists write. I have to confess that I share the concerns of entrepreneurs like Reid Hoffman and economists like Brynjolffson and McAfee about the impact of new technology on average workers. Like them, I worry that dynamic new global companies like Dropbox, Facebook and Google don't require the labor of average workers. I thus welcome the debate about technology and labor that we are about to have in 2012. Traditional media's decline is our loss In his excellent summary of 2011, Cashmore argues that "the pace of change has become blisteringly fast, with traditional industries -- bookstores, video-rental chains, newspapers -- crumbling more quickly than we could have imagined." Yet while Cashmore is right to describe the pace of change in 2011 as "blisteringly fast", he is wrong to suggest that nobody imagined the "crumbling" of old media industries like Blockbuster video rental stores and Borders bookstores. Indeed, one of the most impressive of this year's non-fiction books, Robert Levine's "Free Ride: How Digital Parasites Are Destroying the Culture Business, and How the Culture Business Can Fight Back," charts this demise and argues that it can be blamed, in part, on the online economy's misguided focus on free content and the self-interested permissiveness of powerful digital companies toward online piracy. In many ways, Levine's argument is also about the relationship between technology and employment. Rather than the android, however, Levine's enemy is the online pirate whose theft of intellectual property has resulted, he says, in many thousands of creative professionals losing their jobs. Levine's argument puts him in the camp of innovation skeptics. Like Hoffman and McAfee, this former Billboard editor is not against technology and recognizes that, for better or worse, the digital revolution is an unavoidable reality of our age. But "Free Ride" is a carefully calibrated reminder that there is nothing either inevitable or beneficial about the crumbling of many traditional media companies and that we, as regular consumers of music, books and movies, are the ultimate losers when these industries decline. Artificial intelligence: Good or bad? I've already mentioned two of my top five 2011 books: Levine's "Free Ride" and McAfee and Brynjolfsson's "Race Against The Machine." The next two pretty much pick themselves. Walter Isaacson's blockbuster "Steve Jobs" is a rich and balanced biography of the ultimate innovation fundamentalist, ultra-willing to sacrifice everything and everyone at the altar of technological creativity. While James Gleick's acclaimed "The Information: a History, a Theory, a Flood," is a brilliant analysis of why and how information has become the motor of the early 21st century's innovation economy. My final choice is Tyler Cowen's "The Great Stagnation: How American Ate All the Low-Hanging Fruit of Modern History, Got Sick, and Will (Eventually) Feel Better," which addresses the relationship between technological innovation and prosperity. Cowen, an economist at George Mason university, blows up every orthodoxy. He argues there hasn't been much technological innovation over the last 50 years which, he notes, explains the scarcity of ordinary jobs in today's economy. Ironically, Cowen pins his hopes for future prosperity on the commercial success of artificial intelligence technology -- a development which, of course, McAfee and Brynjolfsson blame for today's unemployment crisis. Load-Date: December 24, 2011 End of Document How to post to Facebook, Twitter after you die CNN Wire

Time: 14/07/2008  
 a movement that advocates not only the study of the potential threats and promises that future technologies could pose to human life but also the ways in which emergent technologies could be used to make the very act of living better. "We want to preserve the best of what it is to be human and maybe even amplify that," Bostrom told CNN. Transhumanists, according to Bostrom, anticipate a coming era where biotechnology, molecular nanotechnologies, artificial intelligence and other new types of cognitive tools will be used to amplify our intellectual capacity, improve our physical capabilities and even enhance our emotional well-being. The end result would be a new form of "posthuman" life with beings that possess qualities and skills so exceedingly advanced they no longer can be classified simply as humans. "We will begin to use science and technology not just to manage the world around us but to manage our own human biology as well," Bostrom told CNN. "The changes will be faster and more profound than the very, very slow changes that would occur over tens of thousands of years as a result of natural selection and biological evolution." Bostrom declined to try to predict an exact time frame when this revolutionary biotechnological metamorphosis might occur. "Maybe it will take eight years or 200 years," he said. "It is very hard to predict." Other experts are already getting ready for what they say could be a radical transformation of the human race in as little as two decades. "This will happen faster than people realize," said Dr. Ray Kurzweil, an inventor and futurist who calculates technology trends using what he calls the law of accelerating returns, a mathematical concept that measures the exponential growth of technological evolution. In the 1980s Kurzweil predicted that a tiny handheld device would be invented sometime early in the 21st century allowing blind people to read documents from anywhere at anytime -- earlier this year such a device was publicly unveiled. He also anticipated the explosive growth of the Internet in the 1990s. Now Kurzweil is predicting the impending arrival of something called the Singularity, which he defines in his book on the subject as "the culmination of the merger of our biological thinking and existence with our technology, resulting in a world that is still human but that transcends our biological roots." "There will be no distinction, post-Singularity, between human and machine or between physical and virtual reality," he writes. Singularity will approach at an accelerating rate as human-created technologies become exponentially smaller and increasingly powerful and as fields such as biology and medicine are understood more and more in terms of information processes that can be simulated with computers. By the 2030s, Kurzweil tells CNN, humans will become more non-biological than biological, capable of uploading our minds onto the Internet, living in various virtual worlds and even avoiding aging and evading death. In the 2040s, Kurzweil predicts non-biological intelligence will be billions of times better than the biological intelligence humans have today, possibly rendering our present brains as obsolete. "Our brains are a million times slower than electronics," said Kurzweil. "We will increasingly become software entities if you go out enough decades." This movement towards the merger of man and machine, according to Kurzweil, is already starting to happen and is most visible in the field of biotechnology. As scientists gain deeper insights into the genetic processes that underlie life, they are able to effectively reprogram human biology through the development of new forms of gene therapies and medications capable of turning on or off enzymes and RNA interference, or gene silencing. "Biology and health and medicine used to be hit or miss," said Kurzweil. "It wasn't based on any coherent theory about how it works." The emerging biotechnology revolution will lead to at least a thousand new drugs that could do anything from slow down the process of aging to reverse the onset of diseases, like heart disease and cancer, Kurzweil said. By 2020, Kurzweil predicts a second revolution in the area of nanotechnology. According to his calculations, it is already showing signs of exponential growth as scientists begin test first generation nanobots that can cure Type 1 diabetes in rats or heal spinal cord injuries in mice. One scientist is developing something called a respirocyte -- a robotic red blood cell that, if injected into the bloodstream, would allow humans to do an Olympic sprint for 15 minutes without taking a breath or sit at the bottom of a swimming pool for hours at a time. Other researchers are developing nanoparticles that can locate tumors and one day possibly even eradicate them. And some Parkinson's patients now have pea-sized computers implanted in their brains that replace neurons destroyed by the disease -- new software can be downloaded to the mini computers from outside the human body. "Nanotechnology will not just be used to reprogram but to transcend biology and go beyond its limitations by merging with non-biological systems," Kurzweil told CNN. "If we rebuild biological systems with nanotechnology, we can go beyond its limits." The final revolution leading to the advent of Singularity will be the creation of artificial intelligence, or superintelligence, which, according to Kurzweil, could be capable of solving many of our biggest threats, like environmental destruction, poverty and disease. "A more intelligent process will inherently outcompete one that is less intelligent, making intelligence the most powerful force in the universe," writes Kurzweil. Yet the invention of so many high-powered technologies and the possibility of merging these new technologies with humans may pose both peril and promise for the future of mankind. "I think there are grave dangers," said Kurzweil. "Technology has always been a double-edged sword." .................................................................................... Do you think technology will allow humans to transcend biology in the future? Would you be comfortable with altering your biology? Should humans try to reprogram their genetics? What do you think the future looks like for mankind and machines? Share your thoughts in the Sound Off box below. Load-Date: January 14, 2009 End of Document Scientists: Humans and machines will merge in future CNN.com

Time: 17/02/2011  
 on mental health? Betty, go ahead. BETTY: I'd like to know if it would help people with mental health problems, like a family that has a history of depression and suicide? BATTISTA: Bill, can it help with that? NYE: Well, you got to -- if those things are actually inherited, not a result of your environment or some dietary problem that you have, then it's very reasonable that you would be able to affect people's mental health by genetically -- by changing their genes. And let me just say, in that case, be real careful because -- the old saying: "We're all crazy" --you know, except me. And then there's another thing. You know, people that are a little nutty, are often -- what we might call a little nutty -- often offer society great benefit. So I'd be real careful about messing with somebody's -- what we believe to be someone's mental genes. We are all here. We all made it this far, through millennia of lions and tigers and bears. So, as nutty as you might think you are, you are well enough off to have gotten this far. BATTISTA: Let's take an Internet question that has to do with cloning. And the question is, "does this make cloning easier?" NYE: Oh yes, it would make cloning easier. Yes, because if you understand everything -- the position of every gene or chromosome -- then you should be able to avoid mistakes in cloning. But I say again, be real careful about any desire you might have to clone humans, because what I think you would end up with is a human who is not changing, is not evolving through history, and that person might have -- that new human, who is cloned from a previous human -- might have trouble resisting diseases as diseases change. I'm not saying that's for sure. That's just my intuition, because we are all moving through history together -- I say all of us -- all the humans and oak trees and viruses and bacteria are all moving through history at the same time. And if you clone a human, you're going to be skipping a step. You're going to be falling one step behind on the escalator of time. So, I'd avoid that. BATTISTA: In some ways, it's more than cloning, isn't it, Bill, because you could -- theoretically with this knowledge -- create or design a new human being? NYE: Yes, from scratch, yes, perhaps you could, yes. BATTISTA: Yes, Dr. Frankenstein. NYE: Yes, but it's very, a very complicated problem. You know, there's a much easier way to have kids… BATTISTA: But you somebody is going to do it. In other words, if we get to a point where you can, you know, put wings on a man, you know someone is going to do it if it can be done. NYE: Well, you say that but I'm not so sure because it is a pretty complex problem. And I'm not sure that there's a lot of money to be made in that, in making a new human from scratch. There may be, but I don't think there's a real economic pressure to do that. I think the first thing is, the first thing people are going to want to invest in is controlling so-called genetic diseases, or genetic conditions. But you raise a very good point, Bobbie, you know: putting wings on a human through genetic manipulation. You know, humans have evolved through millions and millions of years to have this size and shape to live in our environment in a successful way. And trying to radically change that, I think you'd be heading for trouble, I mean, you've got birds and they are pretty good at flying. You've got fish that are pretty good at swimming. And you've got humans who are pretty good at running around on the Earth's surface with both hands free to throw stuff. BATTISTA: Well, then that leads me to my last question here, and it's a big one, though. Who is going to control or say what you can and what you can't do? Who's going to decide what is good and what is bad? NYE: Well, I guess what I would say is: all of us. I would call it the rule of law. And our access to the rule of law in the U.S., and most of the world that we interact with at this high technological level, is through voting. So I encourage everyone who's watching, everyone you meet, to learn as much about this as you can and vote accordingly. Because the big issue, I think, is privacy. You want to be able to keep genetic conditions that others might perceive as a deficit or others might perceive as a tremendous asset, you want to be able to keep that to yourself. Because the way people behave and the choices they make seem to have a huge effect on how they live their lives. And for evidence of that, I give you everybody you've ever met. We are all born with little unusual wackinesses, and we all pretty much get through. BATTISTA: All right, Bill Nye, thanks very much… NYE: Oh, thank you, Bobbie. BATTISTA: … for putting this in layman's terms. NYE: It's a fascinating topic. BATTISTA: It is a fascinating topic. It's about to get more fascinating. But thank you for joining us, appreciate your time. NYE: Thank you. BATTISTA: As we do, by the way, the e-mails are kind of coming fast and furious here. "Discovering what makes up humans is both inevitable and necessary. Thinking we should stop is irresponsible. The faster we find cures for diseases with this information, the better. Science contributes greatly to moral discussions," Dirk in Louisiana says, "religion does not." We will get into that in just a few minutes. And also, how about being denied medical treatment because of a genetic flaw, or being labeled a killer because of a specific gene? The potential for good is balanced equally with the potential for disaster. We'll be back in just a few minutes to talk about all of these things. (COMMERCIAL BREAK) BATTISTA: Welcome back. Joining us now are Anna Foerst, a theologian and research scientist at MIT's artificial intelligence laboratory. She is the director of their "God and Computers" project. Also with us, Dr. Gregory Stock, director of the program on medicine, technology and society at the UCLA School of Medicine. He is co-editor of "Engineering the Human Germline: An Exploration of Science, Ethics and the Genes That We Pass to Our Children." Welcome to both of you. I'm going to start with Anna because, Anna, you may be one of the few people today that does not think that this is that big of a deal. Why not? ANNA FOERTS, MIT RESEARCH SCIENTIST: Well, first of all, we have no idea what actually -- what it actually means to have 90 percent of the genome mapped. Secondly, I think before we actually know what it means -- where all the connections lie, where does human complexity spring from, and all those kind of issues -- we will have another at least 50 years research ahead of us. And actually now it will become really fascinating when we discover the meaning of it all. I thought David Baltimore in his "New York Times" article yesterday had a point when he said humans have around 50,000 genes -- well, perhaps it's up to 100,000, we don't know -- but flies have 18,000, worms have 15,000. We share 99 percent of our genes with chimps, all those kinds of things, which doesn't make us particularly special, right? There's so much commonality there between us and other animals. And so to figure out what the meaning is will be exciting. And actually right to that point, what I thought was kind of interesting was when Bill actually said we have now basically all the instruction to make a person. I would say, no. We have now all the instructions to make a human, but would those people be persons? Would we treat them as such? That's a whole different point of question. BATTISTA: There are a lot of heads nodding. FOERST: And then you have actually to figure out -- pardon me? BATTISTA: I said a lot of heads -- a lot of heads were nodding in the audience when you said that. FOERST: Oh. Well, no, I think this is a question we have to figure out in a societal dialogue. And this is not a question the scientist alone can answer. BATTISTA: I want to quote something else from David Baltimore's article, but I'll do that in just a few minutes. First I want to get Dr. Stock's reaction to -- I mean, this is really a threshold that we're on here. It's not the end of a journey. It's the beginning, correct? GREGORY STOCK, UCLA SCHOOL OF MEDICINE: Very much so. This has been the race to a starting point. It's as though we're now -- we've been slogging through the trail going through peaks, a very difficult precipitous path. And now we're emerging on a plain. And there are just tremendous possibilities. And this is -- it's really an extraordinary development. This is, in many ways, symbolic, of course, when you label a completion of a rough draft of the human genome or something of that sort. But the possibilities are immense, and it's fundamental. And what makes us so special is not the differences between our genomes, the -- on a large scale and that of other animals. But it's the fact that we have sequenced the human genome. We are unraveling the basic blueprint, the story of life. And we are going to go and manipulate that and alter it and also change it in ways that really serve us to cure diseases and all sorts of tremendous possibilities. This is the beginning. And it's one of the critical thresholds -- the critical sort of transitions that life is passing. BATTISTA: Well, now that science has pretty much figured out what we are, we're going to talk a little bit more about who we are because that is a question we haven't really answered about what this information tells us about who we are. Anna a few moments ago mentioned David Baltimore, who is president of the California Institute of Technology, and the article that he wrote in the "New York Times." I want to quote something else from that article where he says: "Our genes look much like those of fruit flies, worms, and even plants. The genome shows that we all descended from the same humble beginnings, and that the connections are written in our genes. That should be, but won't be, the end of creationism." So joining our discussion now on the phone with us is Phillip Johnson, a professor of law at the University of California Berkeley. He is author of "Darwin on Trial" and "An Easy to Understand Guide for Defeating Darwinism by Opening Minds." He believes that living creatures are intelligently designed. Let me get your reactions to that statement that this should end creationism. PHILLIP JOHNSON, UNIVERSITY OF CALIFORNIA AT BERKELEY: Well, if by creationism we mean in the broad sense that you need a creator to do the creating, then in fact the information in DNA is one of the major arguments for the conclusion that you do need a creator. You need an intelligent designer. The reason for that is that the information is like a very complex book of instructions or a computer program. It consists of an arrangement of chemical letters which is not specified by the underlying laws of chemistry, or it wouldn't carry the meaning that it has to carry, just as letters in a book are not specified by the chemistry of ink and paper. So the real question would be: what is the origin of that very high information content? And I would argue very strongly, and our literature supports the view, that you don't have any evidence that natural selection can do anything of that kind, or that it's ever been observed to do anything in the area of creation of complex genetic information. BATTISTA: Or does it perhaps question the Biblical version of how man was created? JOHNSON: Well, I'm not sure it even does that. That's a much broader question that I would get into. But, you know, when you say something like humans have most of their genes in common with fruit flies, one way to take that is that it suggests that genes are very, very far from the whole story. And the very fact -- the mere fact that you have a certain number of common components does not necessarily prove that physical decent and ancestry of each of those components is the explanation for their origin. But in any event, whatever you think about these questions, they aren't going to be any different the day after this sequencing of the human genome than they were before. We've all known all along that there is a genome and that it contains information. To say that because some start has been made toward reading the raw letters -- not the real information, but just the raw letters -- shows that there's no creator, is as ridiculous as saying that once you've learned all the letters in the plays of Shakespeare that shows you didn't need Shakespeare to write it. BATTISTA: Let me get Anne's take on this. FOERST: Well, obviously I agree with some points of that, but I also strongly disagree with another way. I think for me, God is too important to put God in all the whole science it leaves open. So, it is kind of a cheap way out to say, well, the DNA is so complex and there must have been an intelligent designer. This is kind of putting a God of the gaps approach, which I don't agree with. I think when we take the story, the Biblical account of creation both in Genesis I and in Genesis II-IV seriously, then those stories were meant to be descriptions, metaphors, symbols for who we are and what it means to be human and what it means to be in a relationship with God. And those things really define what dignity means, what personhood means, what interaction means, what embodiment means, what male-female relationships means. All those questions -- they are profoundly rich and wonderful. And taking those stories actually into the scientific debate and try to kind of stuck them down as another scientific description, or use the concept of God to fill a holes in the scientific story is the wrong place and it's the wrong approach. Science can answer certain questions, for instance, what is the genome, what are certain genes for, can we actually help to overcome diseases which are genetically based. All those issues that are incredibly important. But I think religion and theology, in general, they have to ask questions on what we actually mean by health, what we mean by normality, what are things we want to change, do perhaps we want to change blue eyes into brown eyes or vice versa? I mean, do we want to change male to female or vice versa, or what are really the issues here in that thing? But I think we cannot use a God argument to agree or disagree with the story of evolution. BATTISTA: I have to take a quick commercial break here. We'll get Dr. Stock's input on this right after that. (COMMERCIAL BREAK) BATTISTA: As part of our CNN/"Time" poll, the question was asked, is the Human Genome Project morally wrong? Almost an even split there if you account for the margin of error. Let me go to Dr. Stock on this question. I -- sometimes I think you have to wonder whether no one wants to rock the boat between science and religion. STOCK: Well, I think that if you look back to the relationship between science and religion, I think a good historical instance is the Copernican Revolution, where the idea that the Earth is at the center of the universe that, that has been displaced. It didn't end religion and it was incorporated into religious notions. And I think the idea that evolution, natural selection is not a fact of reality of the world we live in is going to cease to be an issue in the -- eventually. But it won't displace religion. I think we need to really think about the future. I mean, this is what the Human Genome Project is about and it's going to bring up fundamental challenges to us about who we are as human beings, what it means to be a human, because, you know, we are going to have the power, not just to understand ourselves at a very fundamental way and to look at genetic profiles and what our risk factors are and disease and to tailor drugs to specific genetic constitutions, but also perhaps to manipulate our genetics. What will it mean if we are able to unravel the genetics of aging and delay the onset -- or delay the process, retard the process of aging so that in fact our lifespan is increased significantly. These sorts of things now enter the realm of possibility not immediately ahead, but in many decades, and these are going to fundamentally change the way we interact with each other, our institutions, the -- just the way we see ourselves, the trajectory of human life. And this is the fundamental transition that is occurring and it's happening in other realms too. We don't want to just look at the Human Genome Project. We are creating artificial intelligence. We are breathing a level of complexity into inanimate -- into the sand at our feet that rivals that of life ourself. BATTISTA: Well, you know, you have to wonder, I mean, what makes us human. I guess a lot of people would say it's our soul that makes us human. Is there a gene for the soul? STOCK: I think it's the way we interact with each other, the -- our intelligence, our ability to, in fact, unravel nature itself. There are very many aspects of what it means to be human and this is something that is going to require the wisdom of all of us, and our interactions about it. And I think our ideas of what it really -- what are the fundamental aspects of our humanness and what we value most about life are going to be things that we really have to explore as a society. BATTISTA: Let me go to the audience quickly, Michael. MICHAEL: Yes, I think that everyone will agree that there are a lot of good things that could come from it, but there is also a lot of horrible things also, stuff that we can imagine now and stuff that we would never even think about until it happens. And these -- the way to stop any of those problems would be to kill it before it becomes an option, like the scientists that are working on this, I wonder if they are, you know, so concerned about, you know, will they have the ability to do this that they might not even be thinking about if should they do it or not? STOCK: I would like to respond to that. I think that there are two types of risk. One is, well, we'll make a mistake, or we'll do something wrong, and that's a very real risk, and in fact there will be mistakes made and there will be problems. That's the way it is with any powerful technology. The other risk is that we delay, that we avoid doing, that the things that might have been, don't occur. And if you ask somebody with a disease, a serious disease, or perhaps someone who is older or is -- or may have had their life extended, where there are so many wonderful and possibilities that are growing out of this that they say, we are going to stop it, is just, to me, absurd and it's also impossible. I believe that this is like saying we are going to stop technology. It's not something that is going to occur. There are too many strong reasons to do it that I think very, very few people would actually want to stop technology. BATTISTA: Let me go to the minister's wife. Anne, I'll get to you in just a second. Let me go to the minister's wife from New York, Marilyn. MARILYN: I am a minister, too. BATTISTA: You are? MARILYN: Yes, an ordained minister. We mustn't be afraid to scientifically do the research, because God is the one who has given man the opportunity now to seek new insight into this. We're not surprising God with any of this knowledge. He's the author of all knowledge. He's the one who creates all of life. We musn't be afraid. I'm glad that they did the research for contact lenses. When you needed three pairs of lenses, you were glad to have contacts. Now I'm glad that they do the surgery. Now I can see just as if I was born able to see. What if the research scientists hadn't gone ahead and done that? We must not be afraid. God is allowing the scientific world to be able to do this, and God will allow us to do as much with the information as he wants us to. We must not be afraid. BATTISTA: Yes, right, no, I understand totally. I want to move on to some larger ethical issues as well here that need to be considered with our guests. And Anna, let me -- is it possible that we -- that some people could end up being prisoners of their own genes? In other words, is it going to change the way that we identify people? And in the sort term, could genetic discrimination be a serious problem? FOERST: I think this is one of the most crucial points here. And, you know, you were talking about a gene for the soul, right? In the popular -- in the normal population, soul is always conceived of that what makes us special, as this weird thing inside of us we can't knock down, right? But actually, if we again go to the Bible and see what Mefish (ph) -- soul means, it's a Hebrew term, Mefish. And that is a term which actually means that specialness is emerging out of the very complex interaction of humans and humans and God. So it's the communal value, because God gives us dignity in the sense that I create you in my imagine. And then we give -- assign dignity or deny dignity to others. And now comes the question, when someone is genetically changed in a way, what would be the threshold where we would say, OK, this is a person or not? Take for instance when there is some sense of normality which is defined by whomever, right? I mean, perhaps, you know, perhaps, you know, defined as, you know, being blonde, blue-eyed and 5'10," or whatever. And people who would actually not fit into those categories, would they still be treated as people? If a mother decides, I do not want to have a genetic analysis of my baby in my womb, I want to get it just as it is… BATTISTA: Let me get -- I want to get more into that issue in just a second. I've got to take a break. When we come back, we will get -- I'll talk to Phillip Johnson about reproduction and designer babies, right after this. (COMMERCIAL BREAK) BATTISTA: So many issues, so little time. We were just talking about how we could do a whole hour on some of these questions one by one. But let me ask Phillip Johnson about the problems with human reproduction that may be associated with this discovery. And I think people fear, you know, designer babies are right around the corner. JOHNSON: Well, people do fear that and there's a lot of reason to, that all the unforeseen consequences of that, personally and socially. But if it's possible to make designer babies, we're going to get designer babies, no matter what people think of it, because the rich people are going to want it, and they're going to be able to go in the world to get it. So I don't think there's any way that ethics committees can stop it. But at this point, maybe somebody on this program ought to warn people that maybe we're not working hard enough to distinguish what has actually been shown to be possible and what may turn out to be hype. That is, there;s a whole lot of excitement about sequencing this, but many of the biologists that I talk to say it's very far from knowing what it means or how, even in the future, how much is going to be known about humans from this. The idea that's so widely touted, that they've discovered the recipe or blueprint for making a human being, even just a human body, is hype. That's not reality. BATTISTA: Well, you know, Anna agreed with you on that. So let me have Dr. Stock address that. STOCK: Well, I agree that there is an enormous amount of hype. But usually, it's sort of like when you're at the top of one peak and you look forward into the distance and you can see another peak. And then to get there, you have to go down the mountain. And you slog through the woods, and maybe there are brambles and you maybe even forget, well, was that vision really correct. But actually, it's there. And I think that many of the things that are being said to be, you know, hype are actually just a little bit more distant. I th

Time: 01/03/2004  
Bill Gates went on a campaign tour last week, trying to reinvigorate his base, as they say in politics. The number of students majoring in computer science is falling, even at the elite universities. So Mr. Gates went stumping at the University of Illinois at Urbana-Champaign, Carnegie Mellon, Cornell, M.I.T. and Harvard, telling students that they could still make a good living in America, even as the nation's industry is sending some jobs, like software programming, abroad. ''Will this create more competition? It will,'' he told students at M.I.T. on Thursday. ''It means the U.S. will have to keep its edge in skills.'' Later, noting fears of widespread job losses, he said in an interview, ''But people are way overreacting.'' Mr. Gates urged the students to stay in the game, no matter where they worked -- for Microsoft, a rival, a start-up, a research lab. Matthew Notowidigdo, who came to M.I.T. five years ago and will receive his master's degree in computer science in May, has chosen not to. The head of the department said Mr. Notowidigdo, a 22-year-old native of Columbus, Ohio, was one of his brightest students, who would be welcomed at any computer science Ph.D. program in the country. But Mr. Notowidigdo has decided not to be a software engineer. Instead, he plans to head to Wall Street this spring to join the bond trading desk at Lehman Brothers, where he will work on research and analyzing fixed-income securities. While he may pursue a Ph.D. someday, he says it will be in economics rather than computer science. Enrollments are down at the best computer science schools, where the potential stars of technology's future are groomed. Professors say there is less enthusiasm for the discipline among students, and they worry it may be more than a lingering disenchantment after the dot-com bubble burst. In an effort to counter the trend, Mr. Gates, who personifies technological optimism and the potential payoff, sought to reassure students that their futures were no less bright in an era of outsourcing. The effect of computer technology, he told them, is just beginning and opportunity abounds. Computing, he added, is an ideal field for fine minds to make a difference in society. ''We need your excitement,'' he told students at Harvard. ''Most of these jobs are very interesting and very social -- you work with lots of smart people. I'm excited about the future of computing, and I'm excited to see how each of you can contribute to it.'' But Mr. Notowidigdo's expertise in software design and programming are also valuable tools on Wall Street, as sophisticated computer programs and models are increasingly used to sniff out profit-making opportunities in the financial markets. And he said his summer job last year, doing programming work for a New York investment bank, also influenced his plans for the future. The bank's technology department was outsourcing some software work to India, and as part of the project, programmers from Wipro, a large India outsourcing firm, were brought to New York. Mr. Notowidigdo was impressed at the level of their skills. The outsourcing trend, Mr. Notowidigdo explained, ''factors into my thinking about what I want to pursue as a career.'' His current path as a technologically adept investment banker, he decided, gives him ''a broader set of skills and is less risky than software engineering.'' Mr. Notowidigdo arrived at M.I.T. in 1999, when technological exuberance was in the air and the allure of computing was at its peak. Now, even at elite schools like M.I.T., the number of students choosing to major in computer science is down. John V. Guttag, head of the university's electrical engineering and computer science department, points to the ''worrisome'' downward trend. In the current academic year, 229 sophomores selected his department as their major, down from 282 in 2002 and 342 in 2001, a 33 percent decrease in just two years. Nationally, there is a similar trend. The Computing Research Association's annual survey of more than 200 universities in the United States and Canada found that undergraduate enrollments in computer science and computer engineering programs were down 23 percent this year. M.I.T., like other universities, is seeking to counter the trend by emphasizing that computer science is increasingly a collaborative discipline, involving work with experts in other fields of business and science to solve all kinds of economic and social problems. ''What we have to emphasize is that a good computer science education is a great preparation for almost anything you want to do,'' Professor Guttag said. ''It's a terrific time to be a computer scientist.'' That was the central theme of the Gates tour, which was planned and carried out with the precision of a presidential event. Political veterans were consulted. Aides did a ''walkthrough'' two weeks ago, checking locations, logistics and travel times. Mr. Gates met with dozens of professors at the five campuses and nearly 5,000 students attended his talks. After it was over Thursday night, Mr. Gates, pacing in a basement conference room at Harvard, explained his purpose. ''Computer science is about to be able to accomplish things that people have been working on for decades,'' he said. ''Yet there doesn't seem to be the buzz, excitement and understanding of that so that the best young people are drawn into it.'' With each lecture, his message was that because of ever-faster machines, improved software and the accumulated wisdom of decades of research, computer science was on the cusp of genuine breakthroughs in areas like speech recognition, artificial intelligence and machine-to-machine communication. These advances may take five years, 10 years or more, but they are not so far off now, he said. The trouble with the dot-com years, Mr. Gates told the students, was the delusion that technological revolutions happen overnight, without years of hard work by bright, talented people like them. Yet already, Mr. Gates told them, the established disciplines -- ranging from biology and astronomy to industrial design and finance -- increasingly rely on computer analysis and modeling. And the new disciplines, like nanotechnology, are deeply computational. In that regard, he got no disagreement from Mr. Notowidigdo, the M.I.T. student who has decided to enter the field of financial services. He said he had no regrets about his choice of major. ''It opened so many doors for me,'' Mt. Notowidigdo said. ''And understanding computational technology is going to be essential to almost any field in the future.'' Mr. Gates said electronic commerce had not yet even begun, and that huge gains in communication, convenience and productivity are on the near horizon. He acknowledged that there were challenges to be overcome in areas like privacy and computer security, skipping lightly over the fact that security flaws have bedeviled many Microsoft products. But even the headaches, he said, are merely intriguing problems for smart computer people to conquer, and profit from. Mr. Gates scoffed at the notion, advanced by some, that the computer industry was a mature business of waning opportunity. In one question-and-answer session, a student asked if there could ever be another technology company as successful as Microsoft. ''If you invent a breakthrough in artificial intelligence, so machines can learn,'' Mr. Gates responded, ''that is worth 10 Microsofts.'' http : // www.nytimes.com Graphic Photos: Bill Gates of Microsoft at M.I.T. last Thursday, and a student who questioned him. (Photographs by Robert Spencer for The New York Times)(pg. C1) Matthew Notowidigdo, 22, intends to go into banking. (Photo by Robert Spencer for The New York Times)(pg. C2) Load-Date: March 1, 2004 End of Document Wearing Your Computer On Your Sleeve The New York Times

Time: 16/07/2013  
Bees do it. Birds do it. Bacteria do it. But robots cannot do it. They cannot reproduce themselves. That's one reason robotics researchers do not believe that robots will displace humans any time soon. Last month organizers of the Humanoids 2000 conference surveyed some of the participants about possible social implications of their work. On a scale of 0, for highly unlikely, to 5, for highly likely, the robotics researchers rated the possibility that robots "will be the next step in the evolution and will eventually displace human beings" a zero. "They are much less euphoric than other people, say, movie producers," said Dr. Alois Knoll of the University of Bielefeld in Germany, one of the organizers of the conference, which featured reports on research to create humanoid robots. The survey was conducted before the announcement by Brandeis University researchers that they had built a robotic system that designs and builds other robots. But at the conference, held last week at the Massachusetts Institute of Technology, most participants said robots capable of challenging humanity, as in the movie "Terminator," remained in the realm of science fiction. Dr. Knoll listed the limitations of present-day robots: "We don't have the mechanical dexterity. We don't have the power supply. We don't have the brains. We don't have the emotions. We don't have the autonomy in general to undertake these things to even come close to humans." For example, even if intelligent, conniving robots did exist and wanted to take over the world, they would have to act fast: most exhaust their batteries in less than half an hour. "It's the same problem as electric cars," Dr. Knoll said. But the most difficult obstacle to building an intelligent, evolving, self-reproducing robot may turn out to be the self-reproducing part. The Brandeis system's ability to design and build robots with little help from humans help set off speculation about self-reproducing, evolving robots that could explore the galaxy -- or push humans to extinction. Even the Brandeis researchers call that far-fetched. "We're so far from that, it's kind of a silly question," said one of them, Dr. Jordan B. Pollack. The machines created at Brandeis were little more than toys, far less complex than the system that designed and built them. In the biological world, reproduction is a mundane ability mastered by every creature from the smallest microbe to the largest whale. Scientists have made self-reproducing, evolving organisms of their own -- but only within a computer. In 1994, Karl Sims, who was then a research scientist at Thinking Machines, populated a simulated world with animated, evolving creatures. Other researchers, like Dr. Christoph Adami, a research fellow at the California Institute of Technology, and Dr. Thomas S. Ray Jr. of the University of Oklahoma have created self-replicating computer programs that mutate in ways similar to actual organisms like bacteria, fungi and fruit flies. To give machines the ability to reproduce, however, strikes most robotics researchers as an almost impossible task, even more difficult than building an intelligent robot. Like other robotics researchers, Dr. Rodney Brooks, director of the Artificial Intelligence Laboratory at the Massachusetts Institute of Technology, predicts the development of robots that assemble themselves, so to speak, out of ready-made parts. But to build a copy of itself, a robot would have to forage for raw materials, shape them into motors, sensors, computer chips and other parts and then put the pieces together. Just making computer chips -- currently manufactured in sophisticated factories that cost up to a billion dollars to build -- would be a daunting task for a robot. "Self-replicating robots would have to possess all that ability in a few cubic feet," Dr. Brooks said. "I don't see it on the horizon in any way." Bill Joy, chief scientist of Sun Microsystems, writing in an article in the April issue of Wired magazine, expressed his concern that self-reproducing robots could displace biological life, and he suggested that scientists ought to avoid developing some technologies. Dr. Pollack disagreed. "I think it's kind of being used as a bogeyman," he said. "The question is, will it get out of control? It would take a large industrial, warlike scenario for someone to build a doomsday robot. I don't think anyone knows how to do that. Could robots themselves figure out how to become a doomsday robot? And the answer is, it's as far off as a fax machine is from a Star Trek transporter." Then there is the optimistic dissenter. Dr. Hans P. Moravec, a principal research scientist at the Robotics Institute at Carnegie Mellon University, sees robots as the future -- and welcomes them. He notes that the processing power of computer chips doubles every year to 18 months. "By 2040," said Dr. Moravec, "the robots will be as smart as we are." By then robots should be skilled enough to design and build automated factories that manufacture improved versions of themselves, he predicted. "Business competition will ensure that robots take over human jobs until 100 percent of industry is automated, from top to bottom," Dr. Moravec said. "I think we can retire comfortably." The last significant act of humans, he said, would be the passing of laws to ensure that robot-run companies acted in the interest of humans. "I've been thinking about this for 40 years, and I've become very comfortable with this," Dr. Moravec said. "As you think about these ideas, they gradually become less and less strange." Dr. Moravec said he would not be disturbed even if intelligent robots eventually displaced humanity. "These things are all our descendants," he said. "We built them. They were initially, more or less, in our image. The robots are us. The biology is no longer necessary." Dr. Frank J. Tipler, a professor of mathematical physics at Tulane University, also believes that robots are the future of life, and he argues that the lack of robotic spacecraft zipping past Earth means there are not any other intelligent species in the galaxy. "Not only is there no intelligent life in the galaxy," Dr. Tipler said, "there isn't intelligent life within an order of a billion light-years." Self-replicating robots, Dr. Tipler argues, would also be an efficient way to explore the galaxy. Several spacecraft could be sent from Earth to scout nearby stars. After transmitting reports about what they found, the spacecraft would then set up factories to build more spacecraft to head for the next nearest stars. Even if each probe traveled at a speed of only a tenth of the speed of light, the ever expanding fleet would would be able to visit every star in the galaxy within 10 million years, less than 1/1,000th of the age of the galaxy. Such visions still seem far off for most researchers. "I would never say never," Dr. Knoll said. "But the likelihood of these things happening in our lifetime is very little." He estimated that 90 percent of the Humanoid 2000 participants do not believe Dr. Moravec's predictions. The pessimism may reflect the many obstacles that researchers face in creating useful robots, much less ones that would displace humanity. Two-legged humanoid robots walk slowly and awkwardly. Robots like Kismet at the M.I.T. Artificial Intelligence Laboratory can display childlike reactions when addressed in different tones of voice, but discussions of what would be deemed conscious and intelligent behavior are still rooted in philosophy, not experiments. However, robots do not have to be humanlike, or even visible, to be useful -- or dangerous. In the Aug. 31 issue of Nature, researchers at the University of Lausanne, Switzerland, reported that a group of robots programmed with a few simple rules patterned after ant behavior could efficiently forage their environment. With the development of nanotechnology, the building of machines out of individual atoms and molecules, Mr. Joy worries about artificial microbes that are better than their biological counterparts. Such minuscule robots, less than 1/25,000th of an inch, are one of the aims of Zyvex, a nanotechnology company in Dallas, but company officials say they will not make anything that could pose any danger. Dr. Ralph C. Merkle, a principal fellow of Zyvex and a consultant to the Foresight Institute, says that by design the robots will not be able to evolve. To minimize risks, the Foresight Institute, which studies nanotechnology, has proposed guidelines for its work, including encrypting the robot's programming and designing the robots so that they do not function in an uncontrolled environment. "We're not interested in evolution," Dr. Merkle said. "Quite the reverse." Zyvex's nanorobots would be mindless machines that followed instructions to build other nanorobots, including ones that could be injected into the bloodstream of a hospital patient. "It could be programmed to remove specific stuff you don't want," like cancer cells, blood vessel obstructions or invading germs, Dr. Merkle said. But without the instructions, nano-robots could not reproduce. "If you flush them down the toilet," Dr. Merkle said, "they stop working." Adding a built-in ability to replicate would add unnecessary cost and complexity -- unless one was trying to create a dangerous nanorobot as a weapon. Dr. Merkle agrees with Mr. Joy that perhaps some technologies should be avoided. But, he added, research in this area needs to continue to develop defenses if an enemy unleashed a nanorobot weapon. "There are certain things we need to think about very carefully," Dr. Merkle said, referring to nanorobots. "Should we relinquish autonomous, self-replicating devices that can function in a natural environment? The answer is yes, that looks like a fine thing to relinquish." http : // www.nytimes.com Graphic Photos: Although each is programmed with only simple ant-like instructions,robots built by researchers at the University of Lausanne can exhibit more complex behavior as a group. (University of Lausanne)(pg. F1); Dr. Cynthia L. Breazeal of the M.I.T Artificial Intelligence Laboratory created Kismet, a robot that reacts differently to different tones of voice. (Marlene Karas for The New York Times)(pg. F4) Load-Date: September 12, 2000 End of Document Robotic Vehicles Race, but Innovation Wins The New York Times

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The dawn of the new century may come as a shock to thousands of computers around the world. Programs that record years in two digits and know no time but the 1900's may be stymied by the year 2000. As things now stand, many computers would malfunction or miscalculate because they rely on programs that fail to recognize that the day after Dec. 31, 1999, is Jan. 1, 2000. Some computer programmers are already at work on the problem, but most experts in data processing say ample time remains to avoid trouble. Although everyone agrees that the blind spot exists, expert opinion differs widely about how pressing the problem is and how to address it. The problem, which could affect information ranging from pension records to credit ratings, stems from the widespread practice since the 1960's of programming computers to identify the year by reading two digits and assuming 19 is in front of them. When the 1900's are over, many of today's programs will figure that the 00 or 01 in a date refers to 1900 or 1901. One great comfort to data processing executives is that many of today's problem programs - up to 80 percent by some estimates - will have been replaced by 1999 in the normal course of business. Presumably, new software will be written with the millennium in mind. Just as important, the changes necessary to keep a computer from getting confused by dates after 1999 are often simple. ''None of the changes are fun but they also are not brain surgery,'' said William H. Anderson, a spokesman for Prudential-Bache Securities Inc. Few types of data are so widely used in software as dates. Over the years programmers have used countless methods of coding dates, many of them so obscure that a programmer searching a program for portions dealing with dates may have trouble locating all of them. Unless vulnerable programs are replaced or repaired, the oddity could affect such things as insurance coverage, receipts and payments by businesses, inventories and factory production schedules. 'An Absolute Horror Show' ''It could be an absolute horror show for anyone with mainframe computers,'' said Anthony Graffeo, the senior vice president of information systems at the Home Group, a New York-based insurance company. ''The joke in computing circles is that every data processing manager, no matter how old they are, is saying they plan to retire early in 1999.'' Some computer programs assume that a new date is erroneous if it does not appear to be more recent than the one before it. They will simply grind to a halt, the data experts predict, when they see dates ending in 00 following the last entries from the 1900's, which will end in 99. Yet another group of problem programs operate on five-digit calendars that cannot go higher than 365/99, which represents the 365th day of 1999. These built-in expiration dates may cause computer systems to freeze or wipe out valuable data. A Diversity of Strategies Citibank, one of the world's largest data processors, does not expect to focus on date problems until 1997 or 1998, according to Paul F. Glaser, chairman of the Corporate Technology Committee. The Hartford Insurance Company, which has about 35,000 computer programs, expects to study the problem next year and will probably start making changes in 1993, said John T. Crawford, Hartford's vice president of information management. But Libby-Owens-Ford Inc., a glass manufacturer based in Toledo, Ohio, that became a subsidiary of Britain's Pilkington P.L.C. in 1986, said it began four years ago to eliminate potential problems with the year 2000. 'A Lot of Subtle Problems' ''I suspect there will be a lot of subtle problems, even for those who have been setting aside four digits to represent years,'' said Edward Yourdan, a pioneer in the development of standardized methods for writing software. ''Large organizations have thousands of programs with millions of lines of code. It's very difficult to track down everywhere in the program where they are doing date calculations.'' Some programs, of course, already handle events that will take place after 1999 and will have no problem with the arrival of the millennium. For example, banks and other financial institutions that issue or trade long-term mortgages and bonds have programs that calculate investment yields into the 21st century. And businesses have programs managing physical assets with long lives, such as buildings and oilfields. Programs written for the newest generation of computing equipment - work stations and personal computers - typically run off of calendars that will function well into the next century or further. The standard set by Lotus Development Corporation's popular spread-sheet programs, for instance, uses five digits to record days and disregards years. Jan. 1, 1900, is 00000. Today is 32270. Such time calculations will work until the programs reach 99999, about halfway through the 22d century. Until recently, however, few programs that run on mainframes were designed with even the next century in mind. Problems for Procrastinators ''Those who don't take it seriously are going to be faced with a real problem in the late 1990's,'' said D. Dean Mesterharm, associate deputy commissioner for operations at the Social Security Administration, the third-largest Federal software user after the Defense Department and the Census Bureau. ''They are going to have to tell their bosses they can't do any new applications because they will have all their resources tied up on fixing dates. There are people who feel they can write a special routine to get around it, but I think they will find their programs use dates in ways they aren't aware of.'' Nevertheless, there are strong pressures to procrastinate. Most data processing operations face large backlogs of requests for new applications. Data processing executives are more likely to receive complaints than kudos if they put new projects on hold to address the date issue any sooner than absolutely necessary. Such considerations weigh especially heavily on those who hope to be promoted out of their current jobs long before the millennium. The programmers who work under them are even less likely to regard the date problem with a sense of urgency. Upgrading old programs is widely regarded as tedious work compared with developing new applications. ''The average programmer never thinks beyond next Tuesday,'' said Richard D. Harrison, director of the Federal software management support division of the Federal Government's General Services Administration. Unknown Factors Another concern is that there may be a far smaller pool of people with the experience to fix date problems in older software by the end of the 1990's. In many cases, companies have little idea how their older programs work because the programmers who developed them have left and others have updated them without creating accurate records. Some experts believe that such problems and the rise of powerful networks based on personal computers is accelerating the retirement of older programs, a trend that should ease the transition to the year 2000. The development of new programming techniques will help too. For example, isolating dates in data bases shared by many programs is becoming standard practice. Software Design Aids And a number of companies have computer programs that write computer programs themselves. These software design aids may help companies locate the dates they need to change. The capabilities of such programs could be strikingly increased if they focus specifically on the date problem and use a new generation of artificial intelligence analysis techniques based on studies of how the mind works. ''Our projections for the development of artificial intelligence systems suggest that by 1994 and 1995, they may be able to handle most of this relatively easily,'' said Harry Pontius, head of systems architecture and programs in the Information Resource Management Group at the Defense Department. Skeptics point out that it will take almost as much effort to look for the 5 or 10 percent of problems that even the best automated search systems are likely to miss. At best, they say, companies will end up with scores of niggling problems in the first months of the new millennium. For now, it looks like big data processors are relying heavily on computer vendors and the suppliers of software to provide leadership on standards. Mr. Harrison said that the General Services Administration may soon be encouraging such efforts at the Federal level. And nearly everyone expects a slew of entrepreneurs to emerge with software and consulting services focused on date problems as the new millennium draws closer. ''Very few people are thinking about it yet,'' Mr. Harrison said. ''But it's about to come out of the data processing cocktail circuit and into the coding room as an issue.'' End of Document Evelyn Handler, 78; Led Two Universities The New York Times

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live in a technological universe in which we are always communicating. And yet we have sacrificed conversation for mere connection. At home, families sit together, texting and reading e-mail. At work executives text during board meetings. We text (and shop and go on Facebook) during classes and when we're on dates. My students tell me about an important new skill: it involves maintaining eye contact with someone while you text someone else; it's hard, but it can be done. Over the past 15 years, I've studied technologies of mobile connection and talked to hundreds of people of all ages and circumstances about their plugged-in lives. I've learned that the little devices most of us carry around are so powerful that they change not only what we do, but also who we are. We've become accustomed to a new way of being ''alone together.'' Technology-enabled, we are able to be with one another, and also elsewhere, connected to wherever we want to be. We want to customize our lives. We want to move in and out of where we are because the thing we value most is control over where we focus our attention. We have gotten used to the idea of being in a tribe of one, loyal to our own party. Our colleagues want to go to that board meeting but pay attention only to what interests them. To some this seems like a good idea, but we can end up hiding from one another, even as we are constantly connected to one another. A businessman laments that he no longer has colleagues at work. He doesn't stop by to talk; he doesn't call. He says that he doesn't want to interrupt them. He says they're ''too busy on their e-mail.'' But then he pauses and corrects himself. ''I'm not telling the truth. I'm the one who doesn't want to be interrupted. I think I should. But I'd rather just do things on my BlackBerry.'' A 16-year-old boy who relies on texting for almost everything says almost wistfully, ''Someday, someday, but certainly not now, I'd like to learn how to have a conversation.'' In today's workplace, young people who have grown up fearing conversation show up on the job wearing earphones. Walking through a college library or the campus of a high-tech start-up, one sees the same thing: we are together, but each of us is in our own bubble, furiously connected to keyboards and tiny touch screens. A senior partner at a Boston law firm describes a scene in his office. Young associates lay out their suite of technologies: laptops, iPods and multiple phones. And then they put their earphones on. ''Big ones. Like pilots. They turn their desks into cockpits.'' With the young lawyers in their cockpits, the office is quiet, a quiet that does not ask to be broken. In the silence of connection, people are comforted by being in touch with a lot of people -- carefully kept at bay. We can't get enough of one another if we can use technology to keep one another at distances we can control: not too close, not too far, just right. I think of it as a Goldilocks effect. Texting and e-mail and posting let us present the self we want to be. This means we can edit. And if we wish to, we can delete. Or retouch: the voice, the flesh, the face, the body. Not too much, not too little -- just right. Human relationships are rich; they're messy and demanding. We have learned the habit of cleaning them up with technology. And the move from conversation to connection is part of this. But it's a process in which we shortchange ourselves. Worse, it seems that over time we stop caring, we forget that there is a difference. We are tempted to think that our little ''sips'' of online connection add up to a big gulp of real conversation. But they don't. E-mail, Twitter, Facebook, all of these have their places -- in politics, commerce, romance and friendship. But no matter how valuable, they do not substitute for conversation. Connecting in sips may work for gathering discrete bits of information or for saying, ''I am thinking about you.'' Or even for saying, ''I love you.'' But connecting in sips doesn't work as well when it comes to understanding and knowing one another. In conversation we tend to one another. (The word itself is kinetic; it's derived from words that mean to move, together.) We can attend to tone and nuance. In conversation, we are called upon to see things from another's point of view. FACE-TO-FACE conversation unfolds slowly. It teaches patience. When we communicate on our digital devices, we learn different habits. As we ramp up the volume and velocity of online connections, we start to expect faster answers. To get these, we ask one another simpler questions; we dumb down our communications, even on the most important matters. It is as though we have all put ourselves on cable news. Shakespeare might have said, ''We are consum'd with that which we were nourish'd by.'' And we use conversation with others to learn to converse with ourselves. So our flight from conversation can mean diminished chances to learn skills of self-reflection. These days, social media continually asks us what's ''on our mind,'' but we have little motivation to say something truly self-reflective. Self-reflection in conversation requires trust. It's hard to do anything with 3,000 Facebook friends except connect. As we get used to being shortchanged on conversation and to getting by with less, we seem almost willing to dispense with people altogether. Serious people muse about the future of computer programs as psychiatrists. A high school sophomore confides to me that he wishes he could talk to an artificial intelligence program instead of his dad about dating; he says the A.I. would have so much more in its database. Indeed, many people tell me they hope that as Siri, the digital assistant on Apple's iPhone, becomes more advanced, ''she'' will be more and more like a best friend -- one who will listen when others won't. During the years I have spent researching people and their relationships with technology, I have often heard the sentiment ''No one is listening to me.'' I believe this feeling helps explain why it is so appealing to have a Facebook page or a Twitter feed -- each provides so many automatic listeners. And it helps explain why -- against all reason -- so many of us are willing to talk to machines that seem to care about us. Researchers around the world are busy inventing sociable robots, designed to be companions to the elderly, to children, to all of us. One of the most haunting experiences during my research came when I brought one of these robots, designed in the shape of a baby seal, to an elder-care facility, and an older woman began to talk to it about the loss of her child. The robot seemed to be looking into her eyes. It seemed to be following the conversation. The woman was comforted. And so many people found this amazing. Like the sophomore who wants advice about dating from artificial intelligence and those who look forward to computer psychiatry, this enthusiasm speaks to how much we have confused conversation with connection and collectively seem to have embraced a new kind of delusion that accepts the simulation of compassion as sufficient unto the day. And why would we want to talk about love and loss with a machine that has no experience of the arc of human life? Have we so lost confidence that we will be there for one another? WE expect more from technology and less from one another and seem increasingly drawn to technologies that provide the illusion of companionship without the demands of relationship. Always-on/always-on-you devices provide three powerful fantasies: that we will always be heard; that we can put our attention wherever we want it to be; and that we never have to be alone. Indeed our new devices have turned being alone into a problem that can be solved. When people are alone, even for a few moments, they fidget and reach for a device. Here connection works like a symptom, not a cure, and our constant, reflexive impulse to connect shapes a new way of being. Think of it as ''I share, therefore I am.'' We use technology to define ourselves by sharing our thoughts and feelings as we're having them. We used to think, ''I have a feeling; I want to make a call.'' Now our impulse is, ''I want to have a feeling; I need to send a text.'' So, in order to feel more, and to feel more like ourselves, we connect. But in our rush to connect, we flee from solitude, our ability to be separate and gather ourselves. Lacking the capacity for solitude, we turn to other people but don't experience them as they are. It is as though we use them, need them as spare parts to support our increasingly fragile selves. We think constant connection will make us feel less lonely. The opposite is true. If we are unable to be alone, we are far more likely to be lonely. If we don't teach our children to be alone, they will know only how to be lonely. I am a partisan for conversation. To make room for it, I see some first, deliberate steps. At home, we can create sacred spaces: the kitchen, the dining room. We can make our cars ''device-free zones.'' We can demonstrate the value of conversation to our children. And we can do the same thing at work. There we are so busy communicating that we often don't have time to talk to one another about what really matters. Employees asked for casual Fridays; perhaps managers should introduce conversational Thursdays. Most of all, we need to remember -- in between texts and e-mails and Facebook posts -- to listen to one another, even to the boring bits, because it is often in unedited moments, moments in which we hesitate and stutter and go silent, that we reveal ourselves to one another. I spend the summers at a cottage on Cape Cod, and for decades I walked the same dunes that Thoreau once walked. Not too long ago, people walked with their heads up, looking at the water, the sky, the sand and at one another, talking. Now they often walk with their heads down, typing. Even when they are with friends, partners, children, everyone is on their own devices. So I say, look up, look at one another, and let's start the conversation. http : // www.nytimes.com Graphic PHOTOS: PHOTOS (PHOTOGRAPHS BY DANIEL BORRIS, PETER DASILVA AND BYRON SMITH, FOR THE NEW YORK TIMES)(SR1) PHOTO (PHOTOGRAPH BY PETER DASILVA FOR THE NEW YORK TIMES) (SR6-SR7) Load-Date: April 22, 2012 End of Document Madden NFL 12 Adds Depth To the Franchise The New York Times

Time: 04/08/2009  
The New Old Age Sarah Arnquist posted at nytimes.com/newoldage. At a televised AARP forum last week, President Obama sought to reassure older Americans that the health overhaul he supports would not disrupt their Medicare coverage or force them to change doctors. The comments he received were instructive. Mr. Obama quoted from a letter he received recently from an elderly woman. ''I don't want government-run health care,'' she wrote. ''I don't want socialized medicine, and don't touch my Medicare.'' One caller said that one fear she heard often among friends was that the government would start telling doctors what kind of health care is allowed, and how much. ''When I'm 80, will I still be able to get a hip replacement?'' the woman asked. The president replied that the federal government would not be deciding who should get hip replacements. The government does want to learn more about what treatments and conditions work best and to use that information to guide doctors, he added. Another caller asked about the costs of health legislation and the costs of doing nothing. The price tag of the current health overhaul, the president said, is about $1 trillion over the next 10 years. Doing nothing, he said, would result in uncontrolled cost increases, along with more and more people without health insurance. TierneyLab John Markoff posted at nytimes.com/tierneylab. , an animated figure portraying a health-intake screener demonstrates how an artificial-intelligence system can show empathy. Interviewing a mother and her young son at a clinic, the screener pays attention to either parent or child, as appropriate, and addresses each one directly. The work is representative of a generation of artificial intelligence research that relies heavily on a statistical approach based on the Bayesian theorem, in which systems collect evidence based on a prior hypothesis. As evidence accumulates that is consistent or inconsistent with the hypothesis, confidence in its validity changes. Eric Horvitz, president of the Association for the Advancement of Artificial Intelligence, who took part in making the video, says he hopes that similar techniques will be valuable for the development of intelligent tutoring systems. Dot Earth From Andrew C. Revkin's blog, nytimes.com/dotearth. The Discovery Channel's ''Shark Week'' is here. There's a decent amount of conservation info on the Web site and amid the saturation programming that's otherwise focused on Carcharodon-style carnage. That may work as a kind of bait and switch, drawing eyes with fear and giving them data on environmental damage. But I know more than a few marine conservationists and biologists who would rather see a weeklong special -- call it ''Human Week'' -- on how humans have devastated marine ecosystems, shark species in particular. The Shark Week Web site asks, ''What kind of shark are you?'' Many biologists would ask, ''What kind of species are we?'' http : // www.nytimes.com Load-Date: August 4, 2009 End of Document No Headline In Original The New York Times

Time: 23/12/2014  
Re ''Study to Examine Effects of Artificial Intelligence'' (Dec. 16): It isn't the front end of technology that worries this reader, it's the replacement of life's mundane day-to-day laundry list that undermines an ''experience'' of primordial context. This Stanford study is all well and good. But whose finger is on technology's launch button is much less telling than the trail of cultural remnants in its wake. Replacing human labor has always sounded good, and yet our most egregious transgressions of character are bred in the absence of it. Rather than thinking about the smartest machine and how it might overwhelm us under bad management, consider the average commercial voice mail process. Not only did Aunt Helen lose her livelihood to a bit of computer code, but every exchange made with the machine accrues externalities of red ink. A bit of money removed a bushel of value. Digital transformation has already, in just a few decades, displaced human experience from the biological connections that gifted our nest on this planet. Although artificial intelligence will undoubtedly assist our escape to another one, we are reasonable to admire the irony of that sequence. Art James Port Townsend, Wash. Psychology http : // www.nytimes.com/2014/12/23/science/losing-bits-of-ourselves.html Load-Date: December 24, 2014 End of Document Investors See 2024 Rates Staying High The New York Times

Time: 19/06/2014  
As robotics technology grows ever more surprising, its developers and users face a difficult problem: Robots are kind of scary. Vaughan Bell, a clinical psychologist and writer, noted rising "killer robot anxiety" yesterday on Twitter. He pointed to a story at The Upshot, in which John Markoff and Claire Cain Miller report that coming robotic technology could pose new safety problems. They write: "Unlike today's robots, which generally work in cages, the next generation will have much more autonomy and freedom to move on their own. 'In order for robots to work more productively, they must escape from their cages and be able to work alongside people,' said Kent Massey, the director of advanced programs at HDT Robotics." If you have seen any movies, you know that releasing robots from their cages rarely ends well. Mr. Markoff and Ms. Miller write that the new robots will be equipped with safeguards to keep them from harming people. Mr. Massey tells them that in order to work with humans, "robots must become more like people. They must have eyes and a sense of touch, as well as the intelligence to use those senses." This almost sounds more scary. Others have registered their concern as well. On a recent segment of his show "Last Week Tonight," John Oliver asked Stephen Hawking if robots would "destroy humanity." Mr. Hawking's answer: "Artificial intelligence could be a real danger in the not-too-distant future. It could design improvements to itself and outsmart us all." Mr. Hawking also opined that in a fight with a robot, Mr. Oliver would lose. Meanwhile, at Fox News, John Stossel writes that the rise of artificial intelligence "is scary because scientists say that soon machines will be too smart and self-motivated for us to predict." His prescription for the safety of our species is to make robots libertarians: "That way, they'll be forbidden to commit assault, theft or fraud - the three legal restrictions in which libertarians believe." Whatever their political persuasion, automatons might simply be more unsettling than humans, even if they do essentially the same thing. Bryant Walker Smith, a fellow at the Center for Internet and Society at Stanford Law School, told Mr. Markoff and Ms. Miller that "there's something scarier about a machine malfunctioning and taking away control from somebody." Vaughan Bell, meanwhile, told Op-Talk the rise of robot-fear might be rooted in some recent innovations. He noted that Google's announcement that it would build driverless cars prompted some to ask whether those cars would (or should) be able to choose to kill their drivers. And, he said, the development of drone technology for both military and commercial uses "has raised lots of interesting privacy issues, but more recently security and control concerns." A riot-control drone that fires pepper-spray bullets, for instance, has sparked some outrage - a spokesperson for the International Trade Union Confederation told the B.B.C. it was "a deeply disturbing and repugnant development." Mr. Bell also chalked up some of our rising robot anxiety to "the fact that robots are becoming more equivalent to certain aspects of humanoid and animal behavior." So the eyes and sense of touch Mr. Massey recommends may not be too comforting. But humans' worries don't seem to be holding robot development back. Mr. Bell pointed out that in addition to working on driverless cars, Google recently acquired Boston Dynamics, a company that has designed animal-like robots called BigDog and Cheetah for the U.S. military. "As far as the big tech companies are concerned," he said, "life with robots is going to be the future." Load-Date: June 19, 2014 End of Document Canada Becomes a Magnet for Tech Talent The New York Times

Time: 09/08/2012  
San FranciscoAS a former software engineer, I laughed when I read what the Securities and Exchange Commission might be considering in response to the debacle of Knight Capital's runaway computerized stock trades: forcing companies to fully test their computer systems before deploying coding changes. That policy may sound sensible, but if you know anything about computers, it is funny on several accounts. First, it is impossible to fully test any computer system. To think otherwise is to misunderstand what constitutes such a system. It is not a single body of code created entirely by one company. Rather, it is a collection of ''modules'' plugged into one another. Software modules are purchased from multiple vendors; the programs are proprietary; a purchaser (like Knight Capital) cannot see this code. Each piece of hardware also has its own embedded, inaccessible programming. The resulting system is a tangle of black boxes wired together that communicate through dimly explained ''interfaces.'' A programmer on one side of an interface can only hope that the programmer on the other side has gotten it right. Next, there is no such thing as a body of code without bugs. You can test assiduously: first the programmers test, then the quality-assurance engineers; finally you run the old and new systems in parallel to monitor results. But no matter. There is always one more bug. Society may want to put its trust in computers, but it should know the facts: a bug, fix it. Another bug, fix it. The ''fix'' itself may introduce a new bug. And so on. So now consider that tangle of modules. The bug in one meets the bug in another, and that one in another ... and the possibility of system failure multiplies exponentially. Another absurd thing is trying to define a coding change worth fully testing. A completely new system rollout would certainly qualify. How about installing an updated module from one of those software vendors? It depends on the perceived criticality of the component. How about that new network router and its embedded code? Rarely done. What about a tiny bug fix done by a responsible, hardworking programmer at Knight Capital? Good quality-assurance departments would test that. But individual programmers may see a particular change as insignificant. One time I fixed a function by changing ''less than'' to ''less than or equal to.'' That ''fix'' propagated through the system. And down the system came. And I haven't even mentioned the errors in algorithms devised by all the Ph.D. mathematicians hired to work at Wall Street firms. Written by geniuses they may be, but even Einstein sometimes got things wrong. The best solution would be to bring back the ''market makers'' of old, the people who stood between the bid and the asking price and were responsible for making the trade work. Yet I cannot imagine they will return. Technology does not run backward. Once a technical capability is out there, it is out there for good. The only remaining answer is to go forward. Just as offensive speech is remedied by more speech, the remedy for errant code is more code. Credit card companies offer us a model, albeit a flawed one. Cardholder liability is limited by law: if a charge is fraudulent, issuers are responsible for most of the cost. They therefore have an incentive to detect events that are out of the ordinary. These companies use artificial intelligence programs that get a ''sense'' of your normal purchases: where you use the card, the range of the amounts involved, the sort of vendors you deal with. The programs can sometimes be too vigilant (freezing your card on your first trip to Paris), but their reaction is often correct. They put the questionable charge in abeyance, and the company contacts you, asking, Is this valid? Creepy as it is to have the issuer probing into your habits, by protecting themselves, credit card companies also work for you. Algorithmic stock traders can learn from this example. Each company should create artificial intelligence programs that recognize unusual patterns. The S.E.C. and other regulatory bodies should independently deploy their own systems. The role of these ''watcher'' programs would be to slow things down and inform a human being that something seems strange: artificial intelligence meets human intelligence, and the human gets to sort things out. It is indeed laughable to think that programmers, alone, can solve problems like those at Knight Capital. The credit card model informs us: we need code and attentive human beings. But the indispensable component is the protection induced by the rule of law. Credit card issuers get stuck with the bill. If Knight Capital and other firms were forced to pay back everyone -- everyone -- who got caught in their downdraft, just imagine what brilliant systems the companies would devise. http : // www.nytimes.com/2012/08/09/opinion/after-knight-capital-new-code-for-trades.html Graphic DRAWING (DRAWING BY ANGUS GREIG) Load-Date: August 9, 2012 End of Document Tech's New Wave, Driven By Data The New York Times

Time: 18/06/2012  
-- Just how hard can it be to verify the age of a person online? After all, privacy experts have been complaining for years about how much advertisers know about people who use the Internet. The answer, it turns out, is very hard. Despite attempts by privacy advocates, academics, law enforcement officials, technologists and advertisers to determine a person's age on the Internet, the reality is that, online, it is extremely difficult to tell whether someone is an 11-year-old girl or a 45-year-old man. The question arose last week after Skout, a mobile social networking app, discovered that, within two weeks, three adults had masqueraded as teenagers in its forum for 13- to 17-year-olds. In three separate incidents, they contacted children and, the police say, sexually assaulted them. In response, Skout suspended its app for minors, appointed a task force of security specialists to investigate and find solutions and said it would not resume the service until it could find a better way to vet users' ages online. Skout said it had vetted its users ages through Facebook, which officially prohibits members under 13, but has acknowledged that children find ways to enter. Facebook said recently that it was experimenting with age verification tools that would allow people younger than 13 to join. The resounding response from those who have studied age verification technologies, and, in some cases, put them in place, has been: good luck. The problem is that everyone -- not only sex offenders -- has an incentive to lie. Children want to enter Web sites and forums where their older peers are. The methods the pornography industry uses to confirm online identities of its customers, like credit cards and drivers licenses, cannot be used to identify minors, because the absence of those things does not necessarily mean the person is a child. Federal privacy laws also make it illegal for Web companies to knowingly collect personally identifiable information about children younger than 13. And on social networks, where people can expect a degree of anonymity, the task of verifying someone's age is even more difficult. In most cases, all it takes is an e-mail address to set up an account, and children can lie about their ages. A serious effort to evaluate age verification technologies was made in 2008. At that time, when Facebook was one-ninth its current size, child safety advocates and law enforcement officials expressed concern about sexual predators pursuing children on Myspace, then a Facebook rival. An Internet Safety Technical Task Force was convened, and experts from academia and Web companies set to work examining various ways of verifying ages and sequestering children and adults online. The task force met with 40 companies that said they had solved the problem. They included an ultrasound device maker that scanned users' fingers to determine their age; a vendor that asked users for voice responses to questions so a team of voice analysts could listen for an ''intent to deceive''; and a company that traveled from school to school persuading educators and parents to submit children's personal information -- sex, address, school, birth date -- to an online database that would be accessible to Internet companies. The first two ideas do not appear to have made it past the demonstration stage. The third lost momentum after privacy advocates questioned whether it was intended to protect children from predators, or sell them out to advertisers. Four years later, members of that task force sound, at best, deflated. ''I began to learn that age verification technologies would not address any of the major safety issues we identified,'' said Danah Boyd, a senior researcher at Microsoft and co-director of the task force. An informal survey of major figures in the artificial intelligence industry revealed that little, if any, research is being done on age verification. The Defense Advanced Research Projects Agency, the technology financing arm of the Pentagon that has initiated many Silicon Valley wonders, said it was not pursuing any research on age verification. Microsoft, which has done some of the more ambitious research in identity management, is more focused on hiding users' identities online than on exposing them. ''There has been very little progress, which is astonishing given recent incidents,'' said Senator Richard Blumenthal, Democrat of Connecticut and a major advocate for age verification dating from his days as his state's attorney general. ''You would think, if we can put a man on the moon, we could verify whether someone on the Internet is 13,'' he said. ''You never want to say never, but age verification has serious conceptual difficulties,'' said Oren Etzioni, an artificial intelligence specialist and computer scientist at the University of Washington who has founded several technology companies. The problem, Dr. Etzioni and others say, is that the available options -- establishing a national identity database, tracking users' behavior or knowing the data on a person's phone that might suggest an age group -- are considered violations of privacy. ''Unlike Germany and South Korea, we don't have a national ID system because we don't like the idea of a big government database knowing everything about us from birth to death,'' said Stephen Balkam, chief executive of the Family Online Safety Institute, a nonprofit group. ''So we muddle through, using a variety of methods to discern how old people are, but they're not exactly foolproof.'' A few start-ups are, again, experimenting with new technologies that could help verify ages online. Jumio Inc., in Linz, Austria, developed a technology that turns the Web camera on a personal computer or smartphone into a credit card or identification card reader and lets merchants scan ID's online. But technologists who have put age verification technologies in place say there is always a way to outsmart the system and that such technologies are, at best, a deterrent. ''Companies do age verification because they know they're supposed to, but everybody knows it doesn't really work,'' said Hemanshu Nigam, the former chief security officer at Myspace who now runs SSP Blue, an online security consultancy. ''The truth is, there is no silver bullet.'' The consensus is that the most effective solution for now is not the technologies, but good old-fashioned education and parental vigilance. ''Sequestering age levels will never be the solution online -- it's hard enough to do it in the so-called real world -- and there will always be a work-around,'' said Anne Collier, who served on the 2008 task force and runs NetFamilyNews. ''Really, the single most important thing we can do is to educate parents and young people about what is happening online.'' http : // www.nytimes.com Graphic PHOTOS: An 11-year-old using Facebook. The company does not permit children younger than 13 to have accounts, but it acknowledges that many do and is testing ways to let them join. The 11-year-old girl pointing out the false date of birth she used to gain access to Facebook. (PHOTOGRAPHS BY PAUL SAKUMA/ASSOCIATED PRESS) Hemanshu Nigam, of SSP Blue, an online security firm. (PHOTOGRAPH BY PRNEWSFOTO/SSP BLUE) (B5) Load-Date: June 18, 2012 End of Document Paperback Row The New York Times

Time: 05/06/2001  
At the Lamplighter School, a private elementary school in Dallas, a 5-year-old was recently overheard speaking disparagingly of a fellow student: ''Jonathan is already 4, and he can't do the computer.'' At Carnegie-Mellon University in Pittsburgh, beginning five years from now, every student will be given a computer for personal and academic use. Computers are becoming a familiar part of classroom life for students of all ages, challenging educators to re-examine some cherished ideas about what to teach, and when, and how. Computers are making it possible for third graders and fourth graders to work with elementary concepts of geometry several years earlier than usual. Some colleges are beginning to add such requirements as ''computer literacy.'' The technology has also resulted in traditional concepts of authority being called into question because students often know more than their teachers about computer-related problems. Discussion of computer's effect on education in USAltering the Way People Think Meanwhile, educators are starting to ask whether the way Americans think, the way they go about defining and solving problems, will be altered, for better or for worse, by increased experience with the systematic and quantitative thinking that goes into programming a computer. While educators disagree about how far-reaching the changes wrought by computers will be, they say it is important to begin serious research on the subject. ''Television started in the 1940's, but it was not until the 1960's that anyone did any serious research on its effects on kids,'' said Karen Sheingold, director of the Center for Children and Technology at the Bank Street School of Education in Manhattan. ''We're not going to repeat that mistake with computers.'' According to a recent survey by Market Data Retrieval Inc., at least 15,000 of the nation's 100,000 elementary and secondary schools are using microcomputers as teaching tools. In most cases, the machines are used to teach ideas and skills that had previously been presented in books and on blackboards. Geography students, for example, use computers in exercises that teach them the names and locations of states and their capitals. Many educators and researchers believe, however, that computers used this way represent little more than expensive flashcards and that the potentially revolutionary effects of the technology in education are tied to the nature of the computer itself. They say that if a computer is viewed not as a source of information but as a problem-solving device, it opens up infinite possibilities for the student. One such researcher is Seymour Papert of the Massachusetts Institute of Technology, a mathematician who studied with the Swiss developmental psychologist Jean Piaget and incorporated his ideas that children learn primarily through the manipulation of their environment. Mr. Papert says the effect of computers on learning and thinking is comparable to that of the invention of writing. ''Socrates argued that writing would undermine the oral tradition and destroy memory,'' he said. Mr. Papert and his colleagues at the Artificial Intelligence Laboratory at M.I.T. have invented a computer language for children, called Logo, that numerous schools are using on Texas Instrument and Apple microcomputers. At the Lamplighter School in Dallas, which has been used as a laboratory by Texas Instruments, Coleta Lewis has invented a computer game for the three- and four-year-olds she teaches. The students, by typing in simple commands, can create garages and cars and move them around the screen of their computer terminal in such a way that they ''park'' the cars in the garage. Skills to Help Learn Reading ''At first we didn't know if the kids this age could type in the titles,'' she said. While playing this game, the students also pick up skills that will help them learn to read, such as looking at characters from left to right and identifying words that begin with the same letter. Third graders at Lamplighter use Logo to write simple programs that can move a triangular figure known as Turtle around the screen and create squares, triangles and other shapes. Although there is no instruction in terms such as ''right angles,'' students quickly figure out that they can produce a square by repeating the procedure of moving the turtle forward a given distance and then turning it what they call ''90'' three times in a row. ''Geometry per se is too abstract for children this young, but they can start to develop geometric concepts that they normally wouldn't get until the seventh grade,'' said Theresa Overall, who has supervised the computer program at Lamplighter. Mr. Papert believes computers also have the potential to obliterate the image of mathematics as an abstract discipline and to make both mathematics and technology seem less mysterious to the average person. Making the Abstract Concrete ''The fact that mathematics is an abstract discipline is a cultural construction rooted in the fact that it developed under limited technologies like pencil and paper,'' he said. ''The computer can make the most abstract things concrete.'' Ralph Oliva, who has directed the development of educational programs at Texas Instruments, argues that computers will alter students' view of what they can tackle intellectually. ''A problem may seem insoluble, but with a computer you can break it into mindsized bites,'' he said. Likewise, he said, computers will eventually alter educators' ideas about the kind of knowledge that children must carry around in their heads and about the resources available to students to solve problems. Schools that have experimented with computers report that they can dramatically alter the school social climate. Many teachers say that contrary to their initial expectations, computers tend to promote conversation and cooperation among students rather than isolation and introspection, especially if the machines are placed in clusters. Invariably, an underground network will develop in which students pass around interesting programs and computer tricks that they have discovered. 'No One Is ''Best'' at Computers' Patricia Mattingly, the head of Lamplighter School, said that placing more than 40 microcomputers in her school had had a ''democratizing'' effect. ''No one is 'best' at computers in the way that someone is often 'best' at mathematics,'' she said. ''Children decide who's doing something interesting at the moment, and this changes from week to week.'' Another benefit, she said, is that so long as computers are treated as problem-solving tools rather than sources of canned information, there is no such thing as a ''right'' or ''wrong'' answer. ''There are dozens of ways to do most of the things that a child sets out to do,'' said Miss Overall. Vivian Kalish, who teaches computer use to fourth graders at Public School 166 in Manhattan, said that even when computers give error messages, they do it in such as way that ''kids don't feel demolished - they see adults getting error messages as well.'' A widespread phenomenon in schools that use computers extensively is that students' knowledge of the machines soon outstrips that of teachers. This alters classroom relationships in a way that many teachers view as positive. ''I work with third graders, and most of them are already beyond me,'' said Julie McGinnis, who teaches at Lamplighter. ''I think it is nice at that age to be able to tell an adult something and be right.'' 'I'm Smarter Than They Are' Lewis Stewart would agree. The 14-year-old ninth grader at Joan of Arc Junior High School in Manhattan is said to be a year and a half below grade level in reading, but when it comes to computers he is at the head of his class. He recently designed a complex electronic football game that involved 75 subprograms, and he finds that faculty members often call upon him for help with computer problems. ''It's sort of funny, in a way, to teach the teachers,'' he said. ''But I realize that on some things I'm smarter than they are.'' Some educators say computers in schools will ultimately alter the way people think. Because a computer requires very precise, step-by-step commands and careful analysis to correct a faulty program, Miss Kalish said, ''It's a marvelous tool for learning how to analyze a problem.'' Computers and Rationality Others, however, are less sanguine about such possibilities. George A. Miller, a professor of psychology at Princeton University, questions whether ''millions of rational people solving problems algorithmically will add up to a rational society.'' ''Indeed,'' he said, ''I am not even convinced that computers make individuals rational, that a few years of thinking like a computer can change patterns of irrational thought that have persisted throughout recorded history.'' But Alan Newall, a professor at Carnegie-Mellon who was one of the pioneers in the field of artificial intelligence, which is the subfield of computer science associated with symbolic reasoning and problem-solving, argues that computers open students' minds to a ''whole new language for describing behavior.'' ''It is both a technical tool for calculation and a framework for thinking about the world differently,'' he said. And Lee S. Sproull, a sociologist at Carnegie-Mellon, suggested that computers opened the possibility for students to move from ''mechanical'' to ''procedural'' levels of reasoning. ''Under mechanical reasoning, you push a lever, and something goes up,'' she said. ''You design a steel mill, and it makes steel. The computer, though, can do an infinite number of things, depending on the program. The thinking that goes into it is indirect.'' Computers in Traditional Schools Most schools that are using computers extensively in the lower grades, including Lamplighter, have a fairly progressive attitude toward teaching and learning. They are open to concepts such as students and teachers working together as fellow learners. A highly traditional school might use computers in quite another fashion. Instead of allowing students to set up their own problems, for example, a teacher might tell students to duplicate existing programs and grade them on how close they came to the original. Some teacher say this approach will ultimately break down. ''The very nature of computers is such that they could not be viewed in an authoritarian way even in the most rigid school,'' said Miss Kalish of P.S. 166. Mrs. Mattingly of Lamplighter agreed. ''It would be hard to keep students toeing the mark,'' she said. ''You'd have an underground group that would be hitting the keyboard early in the morning before classes started.'' Fear of Negative Consequences Others argue that values like openness and spontaneity and discovery are not implicit in the technology. ''You can turn kids off computers like anything else,'' said Herbert Simon, a cognitive psychologist at Carnegie-Mellon. ''Most experiments with computers are also experiments in social organization.'' Some educators fear that there is a possibility of negative consequences from the widespread use of computers in schools, such as an overemphasis on problems and ideas that lend themselves to quantification. ''Abraham Maslow once said that to him who has only a hammer, the whole world looks like a nail,'' said Joseph Weizenbaum, a professor of computer science at M.I.T. ''To him who has only a computer, the world world looks like a computable domain. You introduce a new symbolic system, and one begins to interpret the world in such terms. The danger is that we will end up thinking like a computer and that the only things we will recognize as legitimate problems are those where quantification and calculation play a big role.'' James Hoburg, a professor of electrical engineering at Carnegie-Mellon, said he saw a danger of ''reinforcing people who want quick, superficial answers,'' adding that it was important to resist ''the tendency for students to think the program knows more than it does.'' Debate over such issues is only beginning in academic circles, and some educators say it is too early to come to any profound conclusions about the effects of computers on learning and thinking. ''It's like a community with five telephones,'' said Daniel Berg, the provost of Carnegie-Mellon. ''You can't judge the full effects till everyone has it.'' End of Document Joshua Lederberg, 82, A Nobel Winner, Dies The New York Times

Time: 30/06/2001  
the computer scientist John McCarthy coined the term artificial intelligence in the late 1950's, he did not mean to imply that there would be anything second rate about mechanical minds. However, three decades later computers still do not think. Is this because of the technological failings of the computer industry? Or is artificial intelligence theoretically impossible? Finally, since most of the research is financed by the Pentagon, will smarter computers lead to more efficient ways of killing people? Three reports follow. DURING the early 1980's, scientists at Teknowledge, Intellicorp and the other ambitiously named companies in the fledgling artificial-intelligence industry boasted of a bright future in which computers would match people in their ability to make important business decisions. In the last few years, such optimism has gradually faded. Bringing the visionary technologies of artificial intelligence to the market has proved far more difficult than had been anticipated. Many of the original artificial-intelligence companies - including Teknowledge, Intellicorp, the Carnegie Group and the Inference Corporation - have suffered losses. Several others have gone out of business. While the industry is far from developing machines that bring to problem-solving the kind of creativity and flexibility humans use, many of the techniques developed in the early stages of the quest have begun to filter into the mainstream computer industry. Rather than trying to develop computers with rudimentary reasoning abilities, a new generation of companies is concentrating on ways of making conventional computers a little bit ''smarter'' and easier to use than they were before. ''It's a Darwinian process - the first generation is dying because of complete lack of fitness,'' said Alain Rappaport, president of Neuron Data, a four-year-old Silicon Valley firm that made a profit of more than $2 million in 1987. Artificial intelligence began during the late 1950's as an academic discipline dedicated to the possibility that computers could be programmed to think like people. Financed largely by the Defense Department, scientists pursued a variety of ''blue sky'' possibilities: machines that could recognize objects or understand written - and even spoken - English. By the late 1970's a few entrepreneurs began turning their attention to making commercial products such as ''expert systems,'' programs that would diagnose diseases, for example, or give investment advice. It was a captivating vision, and companies as diverse as General Motors and Procter & Gamble experimented with programs that would help executives make decisions or control various industrial processes. But even large companies, which could afford to dabble in the art, found that development costs often outweighed potential rewards. Many expert systems were written in exotic programming languages and would run only on specialized computers costing as much as $100,000 each. In addition, developing expert systems required a cadre of ''knowledge engineers,'' highly paid computer scientists who could translate the expertise of a human specialist into a set of rules that could be programmed into a machine. This task was so daunting that some scientists talked about developing computerized knowledge engineers - expert systems whose expertise was developing expert systems. But nothing nearly so sophisticated has emerged. So far, expert systems have been useful only to solve the most narrowly defined problems, such as diagnosing malfunctioning electronic equipment. Recently, however, there has been new enthusiasm about the promise of intelligent machines. With the advent of the 32-bit microprocessor, a computer-on-a-chip that is as fast and powerful as room-sized machines were five years ago, many corporations are routinely buying far more advanced computers. To cater to this market, software sellers are rewriting their expert systems to run on this new machinery. A Sense of Modesty Artificial intelligence also is increasingly being folded into mainstream programs, such as word processors, making them easier to use and amplifying their computing power. For example, Q&A, a popular personal computer database manager - a kind of filing system for the computer illiterate - uses artificial-intelligence technology to allow users to retrieve information by typing in English sentences, not cryptic computer commands. The second generation of artificial-intelligence companies has scaled back the overly optimistic claims of its predecessors, which often sounded as though they were about to deliver the equivalent of a brain in a box. ''We don't make artificially intelligent machines in much the same way that the Boeing Company doesn't make artifical birds,'' said Harry Reinstein, president of Aion Corporation, a Palo Alto, Calif., company that sells expert systems designed for I.B.M. computers. Rather than trying to re-create human intelligence, the companies are taking cues from how people think and using them to design better software. Progress in building intelligent machines is also coming from a new group of researchers who are attempting to merge neurobiology and semiconductor manufacturing technology. In the past most developments in artificial intelligence have been in the software rather than in the hardware; whatever intelligence there was existed in the programs not in the machines. Researchers are now trying to use recent theories about how the brain works to make complex, neuron-like chips that might be used for machine vision and speech recognition. These fresh approaches suggest that fundamental breakthroughs in machine intelligence may yet be possible. Last year computer scientists, biologists and mathematicians met in Los Alamos, N.M., to discuss the possibility of ''artificial life,'' machines that would evolve over seconds rather than eons, to become ever more intelligent. The problem in the past, says Apple computer scientist Alan Kay, is that researchers have spent their time designing systems that attempt to imitate adult thought processes. Time could be better spent, he argues, trying to recreate the manner in which children learn. Graphic Drawing End of Document Looking at the Future of Artificial Intelligence The New York Times

Time: 09/08/2010  
Even before the world chess champion Garry Kasparov faced the computer Deep Blue yesterday, pundits were calling the rematch another milestone in the inexorable advance of artificial intelligence, the effort to create machines that mimic human thought. Computers will soon become "smarter than us," the supercomputer designer Danny Hillis asserted in a Newsweek essay. Actually the contest, whatever its outcome, only underscores what a flop artificial intelligence has been, especially relative to its founders' goals. The naivete of Marvin Minsky of the Massachusetts Institute of Technology and other pioneers in the field is legendary. In 1966 Professor Minsky gave an undergraduate, Gerald Sussman, the task of building an object-recognition device out of a computer and a television. Object recognition is what you do when you're having lunch with a prospective employer and you suddenly realize that the person at the next table with his back to you is your current employer. Bald spot, blazer, jowls. Yup, it's him. Mr. Sussman did not fulfill his assignment (although he eventually became a prominent researcher). Since then, computers have become unimaginably fast. But their ability to recognize a face or conduct a conversation, activities that humans perform almost, well, thoughtlessly, remains primitive. Computers can do very well in situations with simple, clear-cut data, rules and goals. They do very poorly in situations with complicated or ambiguous data, rules and goals -- that is, in real life. Chess is tailor-made for computers, and Deep Blue is prodigiously powerful, capable of examining hundreds of millions of positions a second. If this silicon monster must strain so mightily to beat a mere human, what hope is there that computers will ever, say, replace diplomats in negotiating weapons treaties? Sure, some programs can "hear" a limited number of words. Banks use neural networks to weigh the merits of loan applications. The immigration service plans to test face-recognition software at borders. But these achievements are paltry compared with the dreams of artificial intelligence enthusiasts. As recently as 1993, Hans Moravec, a roboticist at Carnegie Mellon University, assured me that by the middle of the next century robots would be intelligent enough to usurp the roles of doctors and C.E.O.'s. Professor Minsky fantasizes about converting human personalities into strings of ones and zeros and "downloading" them onto machines. More sober sorts roll their eyes. "Anyone who expects any human-like intelligence from a computer in the next 50 years is doomed to disappointment," Philip Anderson, the physicist and Nobel laureate, asserted in the journal Science two years ago. For the foreseeable future -- and perhaps forever -- HAL, the murderous machine in "2001: A Space Odyssey," and Data, the charming cyborg from "Star Trek: The Next Generation," will remain creatures of science fiction. One day, if not this month, a computer will surely be world chess champion, proving that the game, like loan analysis, is reducible to number-crunching. But the most essential aspects of human thought will continue to elude scientists. As the linguist Noam Chomsky has said, we will probably always learn more about ourselves from novels than we will from science. The question is, should that shortcoming be cause for consternation or celebration? Graphic Drawing/Photo: (Johnny Sweetwater/photo by Associated Press) Load-Date: May 4, 1997 End of Document Herbert A. Simon Dies at 84; Won a Nobel for Economics The New York Times

Time: 25/08/2014  
The Internet is frequently blamed for messing with our minds, making us superficial, distracted and even deluded. But a new study suggests that for some people, using it could actually be healthy. For a study published in The Journals of Gerontology, André J. Xavier and his co-authors analyzed data on 6,442 people between ages 50 and 89. Several times over the course of eight years, the participants were asked if they used the Internet or email, and were given a word-recall test that measured their memory. Those who said they didn't use the Internet or email did worse on the test over time, while those who did actually improved - the effect remained after the researchers took into account age and socioeconomic status. Even those subjects who had relatively low cognitive function at the beginning of the study - meaning they might already be experiencing age-related problems - performed better on the recall tests if they used the Internet than if they didn't. The authors write that it is "the first major study to show that being digitally literate can improve memory" and that countries that promote digital literacy "may expect lower incidence rates for dementia over the coming decades." Mr. Xavier told Op-Talk that using the Internet and email might be beneficial because "our brains need to learn new things and interact with other brains." He explained, "our 'memory' is not inside, it is between us, in our day-by-day life when we talk and see each other." And Internet use may be one way to maintain connections and forge new ones: "Digital literacy is about contact, new horizons, inclusion and humanization, so we start to be an active part of society again." The news that the Internet might actually make people better at something may come as a surprise, since so many have warned of its dangers. One of the most famous warnings is Nicholas Carr's 2008 Atlantic cover story "Is Google Making Us Stupid?" In it, he notes a change in his own mental habits: "My mind now expects to take in information the way the Net distributes it: in a swiftly moving stream of particles. Once I was a scuba diver in the sea of words. Now I zip along the surface like a guy on a Jet Ski." He also worried that the Internet might alter not just our thought processes and reading habits but our very selves. He recalled a scene in the film "2001: A Space Odyssey" wherein the artificial intelligence HAL pleads with his human operator: "In the world of '2001,' people have become so machinelike that the most human character turns out to be a machine. That's the essence of Kubrick's dark prophecy: as we come to rely on computers to mediate our understanding of the world, it is our own intelligence that flattens into artificial intelligence." Mr. Carr also wrote that "for all that's been written about the Net, there's been little consideration of how, exactly, it's reprogramming us." This is no longer true - examinations of the effect of Internet use on our mental faculties are now commonplace. In The Washington Post, Michael S. Rosenwald reports on recent research into Internet use and reading: "With so much information, hyperlinked text, videos alongside words and interactivity everywhere, our brains form shortcuts to deal with it all - scanning, searching for key words, scrolling up and down quickly. This is nonlinear reading, and it has been documented in academic studies. Some researchers believe that for many people, this style of reading is beginning to invade when dealing with other mediums as well." The neuroscientist and reading researcher Maryanne Wolf tells him she's seen the effects herself after a day of heavy Internet use: "I couldn't force myself to slow down so that I wasn't skimming, picking out key words, organizing my eye movements to generate the most information at the highest speed. I was so disgusted with myself." And Michael Harris, in an excerpt from his book "The End of Absence: Reclaiming What We've Lost in a World of Constant Connection," published at Wired, writes that "a slower, less harried way of thinking may be on the verge of extinction" and that "young brains may be more equipped to deal with digital reality than with the decidedly less flashy reality that makes up our dirty, sometimes boring, material world." His warning: "We may be on our way to becoming servants to the evolution of our own technologies. The power shifts very quickly from the spark of human intention to the absorption of human will by a technology that seems to have intentions of its own." But some people see the Internet as a mixed blessing rather than as a curse. In a November article in Scientific American, the psychologists Daniel M. Wegner and Adrian F. Ward write that in one study performed by their team, people who had access to a computer to save facts were worse at remembering them, even if they were asked to. In another, those who were allowed to use the Internet to help them answer trivia questions felt smarter than those who had to answer them on their own. Mr. Wegner and Mr. Ward write that "using Google gives people the sense that the Internet has become part of their own cognitive tool set" and that "the advent of the 'information age' seems to have created a generation of people who feel they know more than ever before - when their reliance on the Internet means that they may know ever less about the world around them." However, they conclude: "As advances in computation and data transfer blur the lines between mind and machine, we may transcend some of the limits on memory and thought imposed by the shortcomings of human cognition. But this shift does not mean that we are in danger of losing our own identity. We are simply merging the self with something greater, forming a transactive partnership not just with other humans but with an information source more powerful than any the world has ever seen." Ms. Wolf also believes Internet use could have benefits. She tells Mr. Rosenwald, "We should be simultaneously reading to children from books, giving them print, helping them learn this slower mode, and at the same time steadily increasing their immersion into the technological, digital age. It's both." Research into the Internet's effects on our mental faculties will no doubt continue for a long time to come, but Mr. Xavier and his team offer one clue that these effects may not be all bad. Per Mr. Wegner and Mr. Ward, the Internet may not be destroying us - rather, it may change us, sometimes for the better. Load-Date: August 25, 2014 End of Document Morning Agenda: The Next Front in Cyberwarfare The New York Times

Time: 14/08/2014  
When a smartphone app wants to alert you to a coming appointment, a text message or some bit of breaking news from your social network, it sends a tiny flare that lights up your phone's lock screen. Depending on how you've set it up, the app might then buzz your pocket like a manic bee, sound a citywide panic alarm or begin playing ''La Cucaracha.'' When they were first introduced, these so-called push notifications were a creative way to let our phones get our attention; now that they buzz every few seconds, they are a constant annoyance. And the glut of notifications is just one example of a growing problem with our smartphones: They are not smart enough. Like a bumbling concierge, your phone often tries to assist you without pausing to consider any of the basic information it collects about your life. For instance, your phone has access to your calendar, and it also knows your physical location. So why isn't it smarter about sending you the right notification at the right time -- for instance, not during a first date? Why can't it prioritize alerts from your wife and your boss over notifications for tweets from your high school pals? And why, long after you've stopped caring about Candy Crush Saga, does it keep alerting you to new developments in the game -- especially at times it should know you're in bed? Your smartphone is the information clearinghouse of your life; it knows more about you than your spouse, your dermatologist and even your favorite national intelligence agency. Yet your phone often behaves as if it knows nothing, with each app, and the entire operating system, blithely disregarding information that should be useful in determining how to help. Once you begin thinking about your phone's stupidity, it's hard to stop. Look at its address book. Why are the names arranged alphabetically rather than in order of the people you interact with most frequently, or the people you're likely to interact with today? Or consider the calendar. Given all that your phone knows about how you spend your day -- where you are, where you're going next and how you're procrastinating -- why can't it suggest the best time for you to tackle each item on your to-do list? The good news is that some of this seems to be happening, slowly. As my colleague Molly Wood wrote in May, start-ups have lately been creating a new breed of programs known as contextual apps. These aim to process information about how you use your phone to improve how it works -- for instance, by arranging the icons on your home screen according to which apps you use most often, or at certain times of the day. One example is Humin, a much-buzzed-about contextual program that's making its debut in Apple's App Store on Thursday. Humin is an intelligent replacement for your iPhone's dialer and contacts program. The app sorts your contact list according to a variety of factors, including how frequently you connect with people, how well you know them and your location. If you've just landed in New York for a business trip, you can load up Humin to see pictures of the people you'll be meeting on your trip. You can also search your contacts as flexibly as you might search the web; look for ''people I met yesterday,'' and the app instantly pulls up a list. Most of this is done automatically. Humin mines the data already on your phone and on various social networks to create its intelligent contacts, so it can determine, without your having to instruct it, how well you know each of your friends, and where you met this person or that. The result is an intriguing glimpse of the future of the smartphone; it's as if your phone suddenly sprouted common sense. Yet while contextual apps like Humin can be useful, I suspect that they aren't enough to combat the routine, generalized idiocy displayed by our phones. The more I used these apps, the more I yearned for Apple, Google and Microsoft to build intelligent features directly into their smartphone operating systems, so that the entire phone can make use of the data it gathers. If a phone's operating system were intelligent, it could apply data-filtering algorithms to more parts of the user interface than any single app could. In particular, an intelligent OS could smartly filter the barrage of notifications generated by your phone's many apps. The phone could decide, based on its assessment of each notification and what it knows about you, whether and how to present an alert: to give it priority to ring your phone immediately, to save it for later or to dismiss it outright. You might be wary of that idea, especially with regard to the mining of your personal information. But an intelligent operating system would not need to invade your privacy any more than your phone already does. Ankur Jain, the co-founder and chief executive of Humin, says that the information that Humin deduces about you lives in a walled garden on your phone. ''What we do is build the index local on your phone, for each person's phone,'' Mr. Jain said. ''So you don't even have to have a data signal to use it.'' Will anyone build such an intelligent OS? Of the tech giants, Google is the likeliest candidate. The company's mission is to sort through information, and it already invests heavily in artificial intelligence, including context-aware programs like Google Now. David Singleton, the director of engineering on Google's Android team, said in an interview that the company was working on giving app developers ways to add more contextual information, and that eventually it might apply some intelligence to how it presents notifications. ''We do see it as a core part of our mission to make this perfect,'' he said. He likened the problem to email. Once, not long ago, we were all hopelessly drowning in messages. But eventually intelligent tools like spam detection and Google's Priority Inbox began to filter our messages, making email slightly more manageable. Mr. Singleton cautioned that intelligently sorting notifications might be more difficult than filtering email. There are many kinds of notifications, and there's a higher penalty if an algorithm guesses wrong; you'd be very angry if your phone didn't show you an important alert just when you needed it (''your bus is arriving!''). It isn't clear when artificial intelligence algorithms will be up to that mission-critical sorting task. But I took the conversation with Mr. Singleton as a reason for hope. As our phones merge with our cars, houses and other connected devices, we could well drown in data. There will be more apps, contacts, messages and other digital bits than any sane human has the time or cognitive capacity to make sense of. As that occurs, the phone will have to morph into an intelligent filter; it will need to be able to figure out who needs you, and why, and decide when to demand your attention. In other words, the smartphone will have to finally start living up to its name. http : // www.nytimes.com/2014/08/14/technology/personaltech/smartphones-overstate-their-iqs.html Graphic PHOTOS: With access to our calendars, contacts and location, smartphones should be able to offer the right assistance at the right moment, but they generally fail to incorporate this contextual awareness when sending us notifications. Some start-ups are addressing perceived smartphone flaws, like contact lists organized alphabetically. (B10) DRAWING (DRAWING BY STUART GOLDENBERG) Load-Date: August 14, 2014 End of Document Discussion of Inflation, Unveiling of Consumer Tech and Bank Earnings; The Week Ahead The New York Times

Time: 16/12/2014  
Scientists have begun what they say will be a century-long study of the effects of artificial intelligence on society, including on the economy, war and crime, officials at Stanford University announced Monday. The project, hosted by the university, is unusual not just because of its duration but because it seeks to track the effects of these technologies as they reshape the roles played by human beings in a broad range of endeavors. ''My take is that A.I. is taking over,'' said Sebastian Thrun, a well-known roboticist who led the development of Google's self-driving car. ''A few humans might still be 'in charge,' but less and less so.'' Artificial intelligence describes computer systems that perform tasks traditionally requiring human intelligence and perception. In 2009, the president of the Association for the Advancement of Artificial Intelligence, Eric Horvitz, organized a meeting of computer scientists in California to discuss the possible ramifications of A.I. advances. The group concluded that the advances were largely positive and lauded the ''relatively graceful'' progress. But now, in the wake of recent technological advances in computer vision, speech recognition and robotics, scientists say they are increasingly concerned that artificial intelligence technologies may permanently displace human workers, roboticize warfare and make of Orwellian surveillance techniques easier to develop, among other disastrous effects. Dr. Horvitz, now the managing director of the Redmond, Wash., campus of Microsoft Research, last year approached John Hennessy, a computer scientist and president of Stanford University, about the idea of a long-term study that would chart the progress of artificial intelligence and its effect on society. Dr. Horvitz and his wife, Mary Horvitz, agreed to fund the initiative, called the ''One Hundred Year Study on Artificial Intelligence.'' In an interview, Dr. Horvitz said he was unconvinced by recent warnings that superintelligent machines were poised to outstrip human control and abilities. Instead, he believes these technologies will have positive and negative effects on society. ''Loss of control of A.I. systems has become a big concern,'' he said. ''It scares people.'' Rather than simply dismiss these dystopian claims, he said, scientists instead must monitor and continually evaluate the technologies. ''Even if the anxieties are unwarranted, they need to be addressed,'' Dr. Horvitz said. He declined to divulge the size of his gift to Stanford, but said it was sufficient to fund the study for a century and suggested the amount might be increased in the future. Dr. Horvitz will lead a committee with Russ Altman, a Stanford professor of bioengineering and computer science. The committee will include Barbara J. Grosz, a Harvard University computer scientist; Deirdre K. Mulligan, a lawyer and a professor in the School of Information at the University of California, Berkeley; Yoav Shoham, a professor of computer science at Stanford; Tom Mitchell, the chairman of the machine learning department at Carnegie Mellon University; and Alan Mackworth, a professor of computer science at the University of British Columbia. The committee will choose a panel of specialists who will produce a report on artificial intelligence and its effects that is to be published late in 2015.In a white paper outlining the project, Dr. Horvitz described 18 areas that might be considered, including law, ethics, the economy, war and crime. Future reports will be produced at regular intervals. Dr. Horvitz said that progress in the field of artificial intelligence had consistently been overestimated. Indeed, news accounts in 1958 described a neural network circuit designed by Frank Rosenblatt, a psychologist at Cornell University. The Navy enthusiastically announced plans to build a ''thinking machine'' based on the circuits within a year for $100,000. It never happened. Still, Dr. Horvitz acknowledged, the pace of technological change has accelerated, as has the reach of artificial intelligence. He cited Stuxnet, the malicious program developed by intelligence agencies to attack Iranian nuclear facilities, as an example. ''My grandmother would tell me stories about people running outside when they saw a plane fly over, it was so unusual,'' he said. ''Now, in a relatively few decades, our worry is about whether we are getting a salt-free meal when we take off from J.F.K. in a jumbo jet.'' http : // www.nytimes.com/2014/12/16/science/century-long-study-will-examine-effects-of-artificial-intelligence.html Load-Date: December 16, 2014 End of Document Hey, A.I. Let’s Talk; Tech Fix The New York Times

Time: 17/03/2013  
you find the use of remotely piloted warrior drones troubling, imagine that the decision to kill a suspected enemy is not made by an operator in a distant control room, but by the machine itself. Imagine that an aerial robot studies the landscape below, recognizes hostile activity, calculates that there is minimal risk of collateral damage, and then, with no human in the loop, pulls the trigger. Welcome to the future of warfare. While Americans are debating the president's power to order assassination by drone, powerful momentum -- scientific, military and commercial -- is propelling us toward the day when we cede the same lethal authority to software. Next month, several human rights and arms control organizations are meeting in London to introduce a campaign to ban killer robots before they leap from the drawing boards. Proponents of a ban include many of the same people who succeeded in building a civilized-world consensus against the use of crippling and indiscriminate land mines. This time they are taking on what may be the trickiest problem arms control has ever faced. The arguments against developing fully autonomous weapons, as they are called, range from moral (''they are evil'') to technical (''they will never be that smart'') to visceral (''they are creepy''). ''This is something people seem to feel at a very gut level is wrong,'' says Stephen Goose, director of the arms division of Human Rights Watch, which has assumed a leading role in challenging the dehumanizing of warfare. ''The ugh factor comes through really strong.'' Some robotics experts doubt that a computer will ever be able to reliably distinguish between an enemy and an innocent, let alone judge whether a load of explosives is the right, or proportional, response. What if the potential target is already wounded, or trying to surrender? And even if artificial intelligence achieves or surpasses a human level of competence, the critics point out, it will never be able to summon compassion. Noel Sharkey, a computer scientist at the University of Sheffield and chairman of the International Committee for Robot Arms Control, tells the story of an American patrol in Iraq that came upon a group of insurgents, leveled their rifles, then realized the men were carrying a coffin off to a funeral. Killing mourners could turn a whole village against the United States. The Americans lowered their weapons. Could a robot ever make that kind of situational judgment? Then there is the matter of accountability. If a robot bombs a school, who gets the blame: the soldier who sent the machine into the field? His commander? The manufacturer? The inventor? At senior levels of the military there are misgivings about weapons with minds of their own. Last November the Defense Department issued what amounts to a 10-year moratorium on developing them while it discusses the ethical implications and possible safeguards. It's a squishy directive, likely to be cast aside in a minute if we learn that China has sold autonomous weapons to Iran, but it is reassuring that the military is not roaring down this road without giving it some serious thought. Compared with earlier heroic efforts to outlaw land mines and curb nuclear proliferation, the campaign against licensed-to-kill robots faces some altogether new obstacles. For one thing, it's not at all clear where to draw the line. While the Terminator scenario of cyborg soldiers is decades in the future, if not a complete fantasy, the militaries of the world are already moving along a spectrum of autonomy, increasing, bit by bit, the authority of machines in combat. The military already lets machines make critical decisions when things are moving too fast for deliberate human intervention. The United States has long had Aegis-class warships with automated antimissile defenses that can identify, track and shoot down incoming threats in seconds. And the role of machinery is expanding toward the point where that final human decision to kill will be largely predetermined by machine-generated intelligence. ''Is it the finger on the trigger that's the problem?'' asks Peter W. Singer, a specialist in the future of war at the Brookings Institution. ''Or is it the part that tells me 'that's a bad guy'?'' Israel is the first country to make and deploy (and sell, to China, India, South Korea and others) a weapon that can attack pre-emptively without a human in charge. The hovering drone called the Harpy is programmed to recognize and automatically divebomb any radar signal that is not in its database of ''friendlies.'' No reported misfires so far, but suppose an adversary installs its antiaircraft radar on the roof of a hospital? Professor Sharkey points to the Harpy as a weapon that has already crossed a worrisome threshold and probably can't be called back. Other systems are close, like the Navy's X-47B, a pilotless, semi-independent, carrier-based combat plane that is in the testing stage. For now, it is unarmed but it is built with two weapons bays. We are already ankle-deep in the future. For military commanders the appeal of autonomous weapons is almost irresistible and not quite like any previous technological advance. Robots are cheaper than piloted systems, or even drones, which require scores of technicians backing up the remote pilot. These systems do not put troops at risk of death, injury or mental trauma. They don't get tired or frightened. A weapon that is not tethered to commands from home base can continue to fight after an enemy jams your communications, which is increasingly likely in the age of electromagnetic pulse and cyberattacks. And no military strategist wants to cede an advantage to a potential adversary. More than 70 countries currently have drones, and some of them are hard at work on the technology to let those drones off their virtual leashes. ''Even if you had a ban, how would you enforce it?'' asks Ronald Arkin, a computer scientist and director of the Mobile Robot Laboratory at Georgia Tech. ''It's just software.'' THE military -- and the merchants of war -- are not the only ones invested in this technology. Robotics is a hyperactive scientific frontier that runs from the most sophisticated artificial intelligence labs down to middle-school computer science programs. Worldwide, organized robotics competitions engage a quarter of a million school kids. (My 10-year-old daughter is one of them.) And the science of building killer robots is not so easily separated from the science of making self-driving cars or computers that excel at ''Jeopardy.'' Professor Arkin argues that automation can also make war more humane. Robots may lack compassion, but they also lack the emotions that lead to calamitous mistakes, atrocities and genocides: vengefulness, panic, tribal animosity. ''My friends who served in Vietnam told me that they fired -- when they were in a free-fire zone -- at anything that moved,'' he said. ''I think we can design intelligent, lethal, autonomous systems that can potentially do better than that.'' Arkin argues that autonomous weapons need to be constrained, but not by abruptly curtailing research. He advocates a moratorium on deployment and a full-blown discussion of ways to keep humans in charge. Peter Singer of Brookings is also wary of a weapons ban: ''I'm supportive of the intent, to draw attention to the slippery slope we're going down. But we have a history that doesn't make me all that optimistic.'' Like Singer, I don't hold out a lot of hope for an enforceable ban on death-dealing robots, but I'd love to be proved wrong. If war is made to seem impersonal and safe, about as morally consequential as a video game, I worry that autonomous weapons deplete our humanity. As unsettling as the idea of robots' becoming more like humans is the prospect that, in the process, we become more like robots. http : // www.nytimes.com/2013/03/17/opinion/sunday/keller-smart-drones.html Graphic DRAWING (DRAWING BY R. O. BLECHMAN) Load-Date: March 17, 2013 End of Document Robots Are Nearing Reach of Consumers The New York Times

Time: 12/11/2014  
On a bright fall day last year off the coast of Southern California, an Air Force B-1 bomber launched an experimental missile that may herald the future of warfare. Initially, pilots aboard the plane directed the missile, but halfway to its destination, it severed communication with its operators. Alone, without human oversight, the missile decided which of three ships to attack, dropping to just above the sea surface and striking a 260-foot unmanned freighter. Warfare is increasingly guided by software. Today, armed drones can be operated by remote pilots peering into video screens thousands of miles from the battlefield. But now, some scientists say, arms makers have crossed into troubling territory: They are developing weapons that rely on artificial intelligence, not human instruction, to decide what to target and whom to kill. As these weapons become smarter and nimbler, critics fear they will become increasingly difficult for humans to control -- or to defend against. And while pinpoint accuracy could save civilian lives, critics fear weapons without human oversight could make war more likely, as easy as flipping a switch. Britain, Israel and Norway are already deploying missiles and drones that carry out attacks against enemy radar, tanks or ships without direct human control. After launch, so-called autonomous weapons rely on artificial intelligence and sensors to select targets and to initiate an attack. Britain's ''fire and forget'' Brimstone missiles, for example, can distinguish among tanks and cars and buses without human assistance, and can hunt targets in a predesignated region without oversight. The Brimstones also communicate with one another, sharing their targets. Armaments with even more advanced self-governance are on the drawing board, although the details usually are kept secret. ''An autonomous weapons arms race is already taking place,'' said Steve Omohundro, a physicist and artificial intelligence specialist at Self-Aware Systems, a research center in Palo Alto, Calif. ''They can respond faster, more efficiently and less predictably.'' Concerned by the prospect of a robotics arms race, representatives from dozens of nations will meet on Thursday in Geneva to consider whether development of these weapons should be restricted by the Convention on Certain Conventional Weapons. Christof Heyns, the United Nations special rapporteur on extrajudicial, summary or arbitrary executions, last year called for a moratorium on the development of these weapons. The Pentagon has issued a directive requiring high-level authorization for the development of weapons capable of killing without human oversight. But fast-moving technology has already made the directive obsolete, some scientists say. ''Our concern is with how the targets are determined, and more importantly, who determines them,'' said Peter Asaro, a co-founder and vice chairman of the International Committee for Robot Arms Control, a group of scientists that advocates restrictions on the use of military robots. ''Are these human-designated targets? Or are these systems automatically deciding what is a target?'' Weapons manufacturers in the United States were the first to develop advanced autonomous weapons. An early version of the Tomahawk cruise missile had the ability to hunt for Soviet ships over the horizon without direct human control. It was withdrawn in the early 1990s after a nuclear arms treaty with Russia. Back in 1988, the Navy test-fired a Harpoon antiship missile that employed an early form of self-guidance. The missile mistook an Indian freighter that had strayed onto the test range for its target. The Harpoon, which did not have a warhead, hit the bridge of the freighter, killing a crew member. Despite the accident, the Harpoon became a mainstay of naval armaments and remains in wide use. In recent years, artificial intelligence has begun to supplant human decision-making in a variety of fields, such as high-speed stock trading and medical diagnostics, and even in self-driving cars. But technological advances in three particular areas have made self-governing weapons a real possibility. New types of radar, laser and infrared sensors are helping missiles and drones better calculate their position and orientation. ''Machine vision,'' resembling that of humans, identifies patterns in images and helps weapons distinguish important targets. This nuanced sensory information can be quickly interpreted by sophisticated artificial intelligence systems, enabling a missile or drone to carry out its own analysis in flight. And computer hardware hosting it all has become relatively inexpensive -- and expendable. The missile tested off the coast of California, the Long Range Anti-Ship Missile, is under development by Lockheed Martin for the Air Force and Navy. It is intended to fly for hundreds of miles, maneuvering on its own to avoid radar, and out of radio contact with human controllers. In a directive published in 2012, the Pentagon drew a line between semiautonomous weapons, whose targets are chosen by a human operator, and fully autonomous weapons that can hunt and engage targets without intervention. Weapons of the future, the directive said, must be ''designed to allow commanders and operators to exercise appropriate levels of human judgment over the use of force.'' The Pentagon nonetheless argues that the new antiship missile is only semiautonomous and that humans are sufficiently represented in its targeting and killing decisions. But officials at the Defense Advanced Research Projects Agency, which initially developed the missile, and Lockheed declined to comment on how the weapon decides on targets, saying the information is classified. ''It will be operating autonomously when it searches for the enemy fleet,'' said Mark A. Gubrud, a physicist and a member of the International Committee for Robot Arms Control, and an early critic of so-called smart weapons. ''This is pretty sophisticated stuff that I would call artificial intelligence outside human control.'' Paul Scharre, a weapons specialist now at the Center for a New American Security who led the working group that wrote the Pentagon directive, said, ''It's valid to ask if this crosses the line.'' Some arms-control specialists say that requiring only ''appropriate'' human control of these weapons is too vague, speeding the development of new targeting systems that automate killing. Mr. Heyns, of the United Nations, said that nations with advanced weapons should agree to limit their weapons systems to those with ''meaningful'' human control over the selection and attack of targets. ''It must be similar to the role a commander has over his troops,'' Mr. Heyns said. Systems that permit humans to override the computer's decisions may not meet that criterion, he added. Weapons that make their own decisions move so quickly that human overseers soon may not be able to keep up. Yet many of them are explicitly designed to permit human operators to step away from controls. Israel's antiradar missile, the Harpy, loiters in the sky until an enemy radar is turned on. It then attacks and destroys the radar installation on its own. Norway plans to equip its fleet of advanced jet fighters with the Joint Strike Missile, which can hunt, recognize and detect a target without human intervention. Opponents have called it a ''killer robot.'' Military analysts like Mr. Scharre argue that smarter weapons should be embraced because they may result in fewer mass killings and civilian casualties. Smart weapons, they say, do not commit war crimes. On Sept. 16, 2011, for example, British warplanes fired two dozen Brimstone missiles at a group of Libyan tanks that were shelling civilians. Eight or more of the tanks were destroyed simultaneously, according to a military spokesman, saving the lives of many civilians. It would have been difficult for human operators to coordinate the swarm of missiles with similar precision. ''Better, smarter weapons are good if they reduce civilian casualties or indiscriminate killing,'' Mr. Scharre said. http : // www.nytimes.com/2014/11/12/science/weapons-directed-by-robots-not-humans-raise-ethical-questions.html Graphic PHOTOS: A Long Range Anti-Ship Missile prototype, launched by a B-1 bomber, is designed maneuver without human control. (PHOTOGRAPH BY DEFENSE ADVANCED RESEARCH PROJECTS AGENCY) Images from a computer showing a strike by a Brimstone missile, a British weapon, on an Islamic State armed truck, at left, in Iraq. The ''fire and forget'' missile can distinguish among tanks and cars and buses without human assistance. (PHOTOGRAPH BY MINISTRY OF DEFENSE/CROWN COPYRIGHT, VIA ASSOCIATED PRESS) (A18) Load-Date: February 19, 2015 End of Document How Should Antitrust Regulators Check Silicon Valley's Ambitions? The New York Times

Time: 10/07/2013  
-- We confront the problem of I.T. weaponry and national security today with the same uncertainty that we brought to nuclear weapons during the early years of the Cold War. We're aware something dangerous is in our hands; we are less certain what to do about it. And while the very newness of the field means discussion now is necessarily tentative, one of the lessons of today's technology is that newness creates the possibility for fast progress. Such a possibility exists in discussions this week between U.S. and Chinese representatives in Washington, the first ever working-level cybersecurity engagement between the two nations. The debate about U.S.-China cyberissues reflects all the symptoms of a larger unease about the information age. Machines and networks have insinuated themselves into every corner of our lives, and we get the sense that they are slipping out of our understanding, if not out of our control. Just pressing an on-off switch implies consenting to deeper, not fully clear rules and risks. This is hard enough to make sense of in the debate about domestic liberty. Cast in the context of two great and uneasy powers, the problem touches hot buttons that have fired some of the worst conflicts in history: territoriality, trust and arms race. One of the first things American and Chinese officials will acknowledge when they sit down this week is how little we know about I.T. systems and national security. But it's important they look beyond immediate issues of hacking and to the deeper problems of power in this new age. Network technology challenges many traditional international rules. The treaties of Westphalia in the mid-17th century, for instance, assumed a state monopoly on violence. But with virtual world weapons, control is harder to define. One can easily imagine a moment in which U.S. and Chinese leaders agree to dial back tensions on some issue only to see privateering nationalist hackers on both sides take up cudgels anyway. Or consider the fact that cyberattacks usually exploit unseen vulnerabilities. So nearly every strike is a ''surprise attack'' -- an anxiety-inducing quirk that argues against the ''trust first, adjust later'' approach essential for dampening the shock of the inevitable crises. Even the most basic question of any new weapons technology -- does it mostly benefit offensive or defensive military action? -- is unclear in this new world. This matters, because misjudgments on this score can lead to deadly miscalculations. A hundred years ago European leaders thought the machine gun was a devastating offensive weapon. They had it wrong and World War I proved to be a five-year defensive bloodbath. Moreover, one of the charms of new technology -- the speed of innovation -- means strategic arrangements made today may be obsolete tomorrow. Consider artificial intelligence: Every day, thinking machines are becoming more important for analyzing data. But as these machines develop, they become ever harder to regulate. If traditional hacking is stoppable because you can always find the hackers, machine-intelligence systems that probe and poke each other may be far harder to understand or regulate with treaties. Given this complexity, what might be accomplished between the United States and China? Here are three possibilities: The two sides could agree to set up a joint, open-network monitoring center staffed by civilian engineers. It should be passive at first -- a group that simply monitors and discusses things like hourly trends in data traffic or stresses on the core I.P. backbone. It should also include attempts to develop notification and management protocols for various emergencies. The effort could also lead to the creation of a ''bit line'' for cyberemergencies that can serve the purpose a ''hot line'' does for traditional security. It would allow the sides to be in immediate, technical contact, and it would foster habits of cooperation and trust. Practically, it may be desirable to set this center up as a ''learning experiment'' designed to be closed after a fixed time, say three years, and ''rebooted'' in some new form. This time-limited approach suits a world where upgrades are essential. It would also give both sides flexibility on initial terms. Similarly, the center could be a bilateral arrangement in year one and then open to other nations as observers in subsequent years. On artificial intelligence, both sides should set up programs to bring engineers together to discuss emerging norms. Informal collaborative work is already under way in this area -- if you came to next week's Association for the Advancement of Artificial Intelligence conference in Washington State, you'd see how many teams contain both American and Chinese researchers. Finally, the two sides could examine what concepts such as ''no first use'' could mean in a cyberenvironment. In particular, the United States should lead an effort to create a framework that, like the Nuclear Nonproliferation Treaty, would offer benefits to countries that sign up. In any event, this should be a part of America's new strategy for a network age. China is a good place to start. The best hope for avoiding a confrontation between rising and established powers is to be creative in developing fresh institutions. We live, after all, in a revolutionary age. The challenge the United States and China face together is not only the interoperability of two great nations. It is the future interoperability of man and machine. Joshua Cooper Ramo is vice chairman of an international consulting firm in New York and the author of ''The Age of the Unthinkable: Why the New World Disorder Constantly Surprises Us and What We Can Do About It.'' http : // www.nytimes.com/2013/07/10/opinion/global/talking-cyberthreat-with-china.html Load-Date: July 10, 2013 End of Document Viewing Robots as Assistants, Not Replacements The New York Times

Time: 29/12/2010  
The Defense Department made public today a previously secret list of technologies regarded as militarily critical that may not be exported to the Soviet Union, its allies or nations with the potential for acquiring nuclear weapons. Publication of the list, which has been revised annually since it was first drawn up in 1980, is part of the Administration's widening effort to slow or stop the flow of what it considers to be militarily useful technology to the Soviet Union and its allies. The list includes know-how - such as for computers, software and telecommunications - and two broad categories, ''keystone equipment'' and ''keystone materials,'' that appeared to apply to a wide range of products. US Defense Department makes public previously secret list of technologies regarded as militarily critical that may not be exported to Soviet Union or its allies; publication is part of Reagan Administration's efforts to slow or stop flow of such equipment to Soviet Union; list of some technical equipment on list (M) 'Unjustified Fears' A memorandum accompanying the list said that the previous secrecy ''not only hindered the utility and application of the Militarily Critical Technologies List but also raised unjustified fears in the academic world and the public at large about the scope of the list.'' The memorandum also said the list ''will aid voluntary efforts to restrict the flow of critical technology'' to the Soviet bloc. The Defense Department has recently published a directive forbidding the release of previously available information about militarily critical technologies if the department considered that information to be useful to military forces of the Soviet Union. The first and largest part of the list consists of 20 categories of know-how, including information systems, directed energy systems, semiconductors, microwave, sensor and undersea system technology. Omitted from the list published today but still in the prohibited category was technology relating to cryptographic systems and nuclear power. Similarly omitted for security reasons were the military rationale for placing any item on the list. Artificial Intelligence Among the specific items in the 20 categories were artificial intelligence technology and technologies relating to particle beams and the design of aircraft, ships, submarines and spacecraft. The second part consists of metal working, chemical, petroleum, electrical and electronic, industrial, transport and precision machinery, equipment and instruments that could be used to produce advanced military weapons. Specific examples would be filter manufacturing and inspection equipment, extrusion equipment for inertial separators and specialized sheetmetal forming machinery. A third category, keystone materials, includes boron hydrides, basic copper sylicate, high-temperature polymers, materials used in optical and X-ray sensors and special paints and coatings for satellite thermal control. In the fourth category are technical data, engineering analyses, specifications and designs that might accompany an otherwise permitted export. The reason for including that sophisticated know-how, the Pentagon said, was that restricted technology listed in the first part ''can be derived through reverse engineering, disassembly, analysis or use'' of other technical descriptions. End of Document Human vs. Machine: Which Brain Is Ahead? The New York Times

Time: 06/07/2004  
In a dusty valley in southern Lebanon, ''Sgt. John Smith'' of the Special Forces scans the scene in front of him. Ahead is a village known as Talle. His immediate mission: to find out who the local headman is and make his way to that house. All discussions with the villagers will have to be conducted in Arabic, and Sergeant Smith must comport himself with the utmost awareness of local customs so as not to arouse hostility. If successful, he will be paving the way for the rest of his unit to begin reconstruction work in the village. Sergeant Smith is not a real soldier, but the leading character in a video game being developed at the University of Southern California's School of Engineering as a tool for teaching soldiers to speak Arabic. Both the game's environment and the characters who populate it have a high degree of realism, in an effort to simulate the kinds of situations troops will face in the Middle East. Talle is modeled on an actual Lebanese village, while the game's characters are driven by artificial-intelligence software that enables them to behave autonomously and react realistically to Sergeant Smith. The Tactical Language Project, as it is called, is being developed at U.S.C.'s Center for Research in Technology for Education, in cooperation with the Special Operations Command. From July 12 to 16, real Special Forces soldiers at Fort Bragg in Northern California will test the game and put Sergeant Smith through his paces. The user plays Sergeant Smith, while the other characters are virtual constructs. Using a laptop, the user speaks for the sergeant, in Arabic, through a microphone headset and controls the character's actions by typing keyboard instructions. The project is part of a major initiative, financed by the Defense Advanced Research Projects Agency, or Darpa, to explore new ways of training troops by making use of the large installed base of existing technology, especially laptops. ''I'd like to be able to send something like this to every soldier stationed in a foreign country,'' said Dr. Ralph Chatham, the Darpa project manager. The philosophy is to deliver what Dr. Chatham calls ''tactical language,'' linguistic skills sufficient to the task at hand. Dr. Lewis Johnson, the director of the Center for Research in Technology for Education, or Carte, said, ''The basic assumption is that there's certain situations you need to face -- such as establishing a rapport with the people you meet and finding out where the headman lives -- and how do you cope effectively with those situations.'' No one is going to be able to read Omar Khayyam after this training, but the agency hopes it will enable soldiers to navigate more easily and safely through the Arab world. In its current version, the game teaches Lebanese Arabic. The U.S.C. team is also working on an Iraqi Arabic version. Darpa hopes to have at least some preliminary version to the military by the fall, Dr. Chatham said. Dr. Johnson, a linguist and an artificial intelligence expert, noted that for English speakers, Arabic is a relatively difficult language, containing sounds that they find hard to distinguish. Moreover, Arabic dialects differ considerably by region. ''People who are taught literary Arabic typically have a lot of difficulty on the street,'' he said. But it is on the street that soldiers need to be most effective. One of the tools the Carte team has developed is a virtual tutor that uses artificial intelligence software to coach individual students through the minefield of pronunciation. To do this, the researchers have had to design speech recognition software tailored specifically for language learners. At the United States Military Academy, senior-level Arabic students who tested an early version last October were ''very enthusiastic'' about it, said Sherri Bellinger, director of West Point's Center for Technology Enhanced Language Learning. ''We've had a vision of learner language speech recognition for a long time, but until recently we didn't have the computer power to make this possible,'' Ms. Bellinger said. Communicating is not just about uttering the right words, Dr. Johnson said. It also involves a huge amount of nonverbal interaction. The Tactical Language Project was born of Darpa's realization that in addition to basic vocabulary soldiers in foreign countries also need to understand basic cultural and gestural cues. Dr. Chatham tells the story of a soldier in Afghanistan, soon after the start of war there: soldiers in his unit came to a village and realized that not only did they not understand a word being spoken, they could not interpret people's nonverbal cues. In tense situations like those induced by war, nonverbal messages may be just as important as words themselves. The Tactical Language Project game is intended to teach such skills. Users learn, for example, that when Sergeant Smith starts or finishes a conversation with an important person, he can cross his right hand over his heart and bow slightly, a common gesture of respect in the Arab world. As with speech, nonverbal communication is a two-way process, and here, said Dr. Hannes Vilhjalmsson, a Carte scientist, realism becomes a critical quality. A great deal of the team's research has been directed at getting the game's virtual characters, or ''agents,'' to behave in realistic ways. Dr. Vilhjalmsson pointed out a simple example: ''When you are talking to someone, you want them to be facing you.'' Humans take this for granted, but agents have to be taught it. Such intense levels of realism may sound like a luxury, but Dr. Chatham notes that research on memory formation suggests that people retain more information when they are in a heightened state of mental engagement with their surroundings. In order to make the game's characters as realistic as possible, each one is programmed with what the researchers call a belief system. Each character has its own individual set of beliefs about the world and about Sergeant Smith that will change in response to his actions, said Mei Si, a doctoral student in charge of coding this element. One of their most critical beliefs is their trust level, Ms. Si said. If Sergeant Smith behaves appropriately, he will gain the characters' trust and they will help him; if not, he is likely to cause suspicion. ''You don't have to be obnoxious,'' Dr. Vilhjalmsson said. ''Mainly, you just have to be impolite, or not seem to care about what you are saying.'' Dr. Johnson noted that one of the first things many users have to learn is simply to say thank you. ''Most video gamers are not used to saying thank you in the context of a game,'' he said. Developing so-called intelligent agents is currently a hot research topic and U.S.C.'s Information Sciences Institute, where Carte is based, is home to world leaders in this field. Two institute scientists, Dr. David Pynadath and Dr. Stacy Marsella, have developed a program called PsychSim to model individual and group behavior among agents. PsychSim is the software platform guiding the behavior of the Tactical Language characters. Another characteristic the agents possess is what Dr. Vilhjalmsson calls their ''arousal level.'' One way of understanding this, he said, is as a form of virtual anxiety: ''If their anxiety level gets too high, it will trigger them to act.'' In a scene in a cafe, Sergeant Smith must try to find out who the village headman is. If he doesn't act properly, one of the cafe patrons will jump up and demand to know who he really is. If tensions escalate, the patron will eventually accuse the sergeant of being a C.I.A. agent. Intelligent agents have been used before in research environments, but this is the first time such sophisticated behavioral modeling has been put in a video game, Dr. Johnson said. In the second phase of the project, beginning late this year, two further languages will be included. One will probably be Dari, a major language in Afghanistan. Another under consideration is one of the Indonesian languages. Once the basic platform is designed, Dr. Chatham said, the team hopes to use it with many different languages and cultural contexts. ''We're spending a lot on developing this,'' Dr. Chatham said, noting that the cost is about $7.2 million. But the hope, he said, is that eventually such intelligent games could be used not just for teaching languages but ''for other kinds of memory-intensive training tasks.'' http : // www.nytimes.com Correction An article in Science Times on Tuesday about a project at the University of Southern California that uses artificial intelligence to help soldiers learn Arabic gave an incorrect literary example. Omar Khayyam's poetry is in Persian, not Arabic. Because of an editing error, the article also misstated the location of Fort Bragg, where Special Forces soldiers are to test a video game this month as part of the project. It is in North Carolina, not Northern California. Correction-Date: July 10, 2004 Graphic Photos: Dr. Lewis Johnson, left, and Dr. Hannes Vilhjalmsson have helped design a video game for the military that teaches Arabic language skills. (Photo by J. Emilio Flores for The New York Times) (Photo by University of Southern California)Chart: ''Tactical Language''How Arabic is taught to soldiers in a video game developed at U.S.C.The first screen teaches words and phrases. The student hears a virtual tutor, Nadim, say the phrase, then repeats it. Nadim will comment on the students pronunciation.Later, a character representing the student, Sgt. John Smith, introduces himself to an older man (standing at right) in a cafe. Smith uses a respectful gesture hand over heart, accompanied by a nod of the head.Diagram showing the difference between Arabic and American words. Load-Date: July 6, 2004 End of Document War Machines: Recruiting Robots for Combat - Correction Appended The New York Times

Time: 11/11/2014  
Defense giant Raytheon is using motion capture and video game-based technology to develop sophisticated virtual simulators for the U.S. military.  
The defense contractor uses motion capture technology to create ‘avatars,’ or virtual service members, who can help in the training of military personnel.  
Similar to a video game, service members can train on digital versions of real world equipment by moving their avatars around a virtual landscape. The avatars, for example, are used to train soldiers operating the Patriot Air and Missile Defense system. The simulation technology has also been used to train troops on the Javelin missile system and to teach sailors how to respond to onboard emergencies.  
Luis Ruiz, 3D Team Lead for Raytheon Intelligence, Information and Services told FoxNews.com that the simulation software is an authentic recreation of real world scenarios.  
“What makes it cool is the equipment,” he said. “For example, the crane that is used to reload a Patriot missile is programmed the exact same way as its real-life counterpart.”  
A cost-effective method of training on expensive military hardware, the simulation software has a ‘multiplayer’ setting that lets a number of service members participate in the same virtual task, mirroring the way a unit would perform in real life. “In a multiplayer environment, it helps to identify your teammates, as well as yourself, in that environment,” Ruiz said.  
Raytheon’s software also uses artificial intelligence. “You have the option of going through the training as a multiplayer, [but] if you don’t have enough players with you, artificial intelligence will walk through the training with you,” Ruiz said.  
Because the virtual ‘world’ is built using video game software, Raytheon employs the same off-the-shelf technology as game makers, such as game controllers, making the simulation extremely accessible to troops.  
“This generation of ‘warfighter students’ are known as the ‘video game generation,’ Patricia Vasquez, multimedia production manager at Raytheon Intelligence and Services told FoxNews.com. “We’re using technology to bring their training into a form that they can easily understand.”  
Raytheon, which manages a range of military training at over 600 locations around the world, has been using motion capture on its virtual simulations for the last 2 years. The company builds the avatars by capturing actors’ movements on a series of cameras set up at a facility in El Paso, Texas.  
“Motion capture reduces the amount of hours that an artist needs to animate because the actor drives the performance,” Ruiz said. “It can create a series of avatar animations in one day that would take an artist two weeks.”  
The video game industry, however, is constantly evolving, and Raytheon expects to build some of the latest technologies into the next version of its software. “We’re exploring Oculus Rift, and new game controllers, augmented reality, and mobile,” Vasquez said. “We expect to develop more of these multiplayer scenarios.”  
With hackers posing an ongoing threat to the U.S. military and its tech partners, however, Raytheon told FoxNews.com that it keeps its virtual training software well away from the cloud. “We still deliver the disk [to the military] to avoid cloud-based vulnerabilities,” Ruiz explained.

Time: 23/02/2013  
President Obama's recent announcement of a plan to invigorate the study of neuroscience with what could amount to a $3 billion investment, a reasonable taxpayer might ask: Why brain science? Why now? Here's why. Imagine you were an alien catching sight of the Earth. Your species knows nothing about humans, let alone how to interpret the interactions of seven billion people in complex social networks. With no acquaintance with the nuances of human language or behavior, it proves impossible to decipher the secret idiom of neighborhoods and governments, the interplay of local and global culture, or the intertwining economies of nations. It just looks like pandemonium, a meaningless Babel. So it goes with the brain. We are the aliens in that landscape, and the brain is an even more complicated cipher. It is composed of 100 billion electrically active cells called neurons, each connected to many thousands of its neighbors. Each neuron relays information in the form of miniature voltage spikes, which are then converted into chemical signals that bridge the gap to other neurons. Most neurons send these signals many times per second; if each signaling event were to make a sound as loud as a pin dropping, the cacophony from a single human head would blow out all the windows. The complexity of such a system bankrupts our language; observing the brain with our current technologies, we mostly detect an enigmatic uproar. Looking at the brain from a distance isn't much use, nor is zooming in to a single neuron. A new kind of science is required, one that can track and analyze the activity of billions of neurons simultaneously. That's a tall order, but it's worth it, because this is an exceptionally personal mystery to crack. Our thoughts, desires, agonies and ecstasies all emerge from the details of the neural landscape. Just as an alien studying the planet could catalog several large-scale calamities -- disease epidemics, volcanic eruptions, political-feedback loops that lead to war -- so can we observe disasters transpiring in the dense communities of our brain cells. We give them names like neurodegeneration, stroke and epilepsy. But just because we can name them doesn't mean we know how to fix them. For example, we have little idea how to mend the damage from the widespread destruction of a traumatic brain injury (the signature injury of America's wars). The same goes for diseases like Alzheimer's, Parkinson's and Huntington's, and for brain tumors, autism, dementia, paralysis and so on. While we have improved our ability to diagnose problems, we have yet to understand how to remedy them. Learning to better speak the language of the brain is our best hope for turning the chaos into order, for unmasking and addressing the hidden patterns behind disease. But deciphering the neural code is not only about physical health. Consider the implications for societal health. A deeper understanding of mental illness will improve early detection, resources and rehabilitation, potentially helping us find a way to stop using our prisons as a de facto mental health care system. Similarly, we can leverage brain science for a more cost-effective approach to drug crime. We cannot win the war on drugs simply by attacking supply; we must focus on demand. And that requires decoding the circuitry and pharmacology in the brain of the addict. Beyond social policy, a better understanding of the brain will steer the future of our technologies. Smart people have been beating at the door of artificial intelligence for decades with only limited success. Google Translate can convert any language to any other, but understands nothing of the content. Watson still can't answer simple questions like, ''When President Obama walks into a room, does his nose come with him?'' Our most promising hope for creating artificial intelligence is figuring out how natural intelligence works. It can also usher in an era of bio-inspired machinery. You can't pull a piece of circuitry out of your smartphone and expect the phone to function. But when a young child with severe epilepsy has half of her brain surgically removed, she tends to do just fine: the remaining brain tissue automatically rewires itself to take over responsibility for the parts that are missing. Similarly, when an animal breaks a leg, its brain adapts the gait of the remaining legs so the animal can keep moving. We don't know how to build self-configuring machines like these. When a Mars rover loses a wheel, our investment ends: it becomes another piece of immovable space junk. Imagine a future in which we capitalize on the principles of neural reconfiguration, producing devices -- from smartphones to cars to space stations -- that flexibly adapt rather than bust. For now, the brain is the only functioning example of such futuristic machinery on our planet. Brain health, drug rehabilitation, computer intelligence, adaptive devices -- these economic drivers would lavishly pay back any investment in brain research. So when a taxpayer asks how to endow our country with a confident future, you can reply, the answer is right in back of your eyes. http : // www.nytimes.com/2013/02/23/opinion/what-our-brains-can-teach-us.html Graphic DRAWING (DRAWING BY KRISTINA COLLANTES) Load-Date: February 23, 2013 End of Document Top Universities Test the Online Appeal of Free The New York Times

Time: 29/03/2012  
The federal government is beginning a major research initiative in big data computing. The effort, which will be announced on Thursday, involves several government agencies and departments, and commitments for the programs total $200 million. Administration officials compare the initiative to past government research support for high-speed networking and supercomputing centers, which have had an impact in areas like climate science and Web browsing software. ''This is that level of importance,'' said Tom Kalil, deputy director of the White House Office of Science and Technology Policy. ''The future of computing is not just big iron. It's big data.'' Big data refers to the rising flood of digital data from many sources, including the Web, biological and industrial sensors, video, e-mail and social network communications. The emerging opportunity arises from combining these diverse data sources with improving computing tools to pinpoint profit-making opportunities, make scientific discoveries and predict crime waves, for example. ''Data, in my view, is a transformative new currency for science, engineering, education, commerce and government,'' said Farnam Jahanian, head of the National Science Foundation's computer and information science and engineering directorate. ''Foundational research in data management and data analytics promise breakthrough discoveries and innovations across all disciplines.'' On Thursday, the National Science Foundation will announce a joint program with the National Institutes of Health seeking new techniques and technologies for data management, data analysis and machine learning, which is a branch of artificial intelligence. Other departments and agencies that will be announcing big data programs at a gathering on Thursday at the American Association for the Advancement of Science in Washington include the United States Geological Survey, the Defense Department, the Defense Advanced Research Projects Agency and the Energy Department. These initiatives will mostly be seeking the best ideas from university and corporate researchers for collaborative projects. The private sector is the leader in many applications of big data computing. Internet powers like Google and Facebook are masters at instantaneously mining Web data, click streams, search queries and messages to finely target users for online advertisements. Many major software companies, including I.B.M., Microsoft, Oracle, SAP and SAS Institute, and a growing band of start-ups, are focused on the opportunity in big data computing. Still, there is an important complementary role for the government to play where the incentives for private investment are lacking, according to administration officials and computer scientists. Such areas, they say, include scientific discovery in fields like astronomy and physics, research into policy issues like privacy, and funding for research at universities, where the high-technology work force of the future is educated. But for government departments and agencies promoting and mastering big data computing, there is self-interest as well. ''There is recognition by a broad range of federal agencies that further advances in big data management and analysis are critical to achieving their missions,'' said Edward Lazowska, a computer scientist at the University of Washington. ''It doesn't matter whether the mission is national defense, energy efficiency, evidence-based health care, education or scientific discovery.'' At the session on Thursday, there will be presentations by scientists who are experts in big data computing. Astronomy is a pioneering discipline for the approach. The Sloan Digital Sky Survey has used digital sensors to scan distant galaxies from an optical telescope in New Mexico, collecting vast amounts of image data that are processed with powerful computers. The resulting three-dimensional mapping has yielded a ''visual representation of the evolution of the universe,'' said Alexander Szalay, a professor at Johns Hopkins University. He calls the digital sky program a ''cosmic genome project.'' At Stanford University, an intriguing big-data experiment in online education is under way. Last year, three computer science courses, including videos and assignments, were put online. Hundreds of thousands of students have registered and participated in the courses. The courses generate huge amounts of data on how students learn, what teaching strategies work best and what models do not, said Daphne Koller, a professor at the Stanford Artificial Intelligence Laboratory. In most education research, teaching methods are tested in small groups, comparing results in different classrooms, Ms. Koller explained. With small sample groups, research conclusions tend to be uncertain, she said, and results are often not available until tests at the end of school semesters. But in an online class of 20,000 students, whose every mouse click is tracked in real time, the research can be more definitive and more immediate, Ms. Koller said. ''If 5,000 people had the same wrong answer, it's obvious a concept is not getting through, and you have a clear path that shows where students went wrong,'' she said. That kind of data tracking in education, she said, provides ''an opportunity no one has exploited yet.'' http : // www.nytimes.com Graphic PHOTOS: The Sloan Digital Sky Survey collects image data from an optical telescope in New Mexico, top at left. Tom Kalil, above, of the White House Office of Science and Technology Policy. (PHOTOGRAPHS BY FERMILAB VISUAL MEDIA SERVICES PHIL LARSON) Load-Date: March 29, 2012 End of Document A Graphic Novel With Teeth (and Claws) The New York Times

Time: 15/01/2013  
When Ray Kurzweil discusses human destiny, it is not always clear whether he's talking about technology or theology. It is technology that defines his resume; he has spent 34 of his 51 years inventing ingenious uses for artificial intelligence. But like a priest caught playing in a physics lab, he keeps coming up with inventions inspired by aesthetics and social conscience. For instance, when he was still in high school, he wrote a program that composed music, while his latest software, available at his Web site, writes poetry. In between he created machines that read to the blind, software that draws and paints, electronic keyboards that produce the sounds of acoustical instruments and one of the most advanced and commercially successful forms of computer speech recognition. All were concrete products of a restless mind consumed by the question of what will be. A more abstract product of that vision is his latest book, "The Age of the Spiritual Machine: When Computers Exceed Human Intelligence" (Viking, 1999). In it, he looks at the exponential increase in calculating power since the turn of the century and concludes that within 50 years, machines will not only be smarter than humans but also smart enough to persuade us that they are conscious beings in their own right. That assertion, not surprisingly, has drawn the wrath of several prominent philosophers who question his definitions of both intelligence and consciousness. John R. Searle, the renowned University of California at Berkeley professor of philosophy, wrote in The New York Review of Books that the fatal flaw in "Kurzweil's entire argument" is that "it rests on the assumption that the main thing humans do in their lives is compute." In a phone interview this week he added: "Kurzweil's proposals are preposterous science. I think he got a little carried away and made massive philosophical errors, too." But while the debates about what defines intelligence and consciousness have gained the most public attention, the far more compelling idea in the book is his prediction that our progeny -- if not some of us alive today -- are destined to be human-machine hybrids. Based on current trends in computer and biological sciences, he says that a superpowered intelligence will result from such a hybrid. The merging of human brains and computer circuits, he asserts, will enable the species to redesign itself and determine not just its own destiny but the fate of the universe. To become, in other words, God-like. "In my view," Mr. Kurzweil writes in the book's conclusion, "the primary issue is not the mass of the universe or the possible existence of antigravity or of Einstein's so-called cosmological constant. Rather the fate of the universe is a decision yet to be made, one which we will intelligently consider when the time is right." In his review Mr. Searle writes in an amazed tone: "Kurzweil does not think he is writing a work of science fiction or a parody or satire. He is making serious claims that he thinks are based on solid scientific results." Over dinner at a Boston hotel, Mr. Kurzweil insisted, "This stuff isn't science fiction." His voice was soft, almost emotionless, but the ideas emerged fully formed, articulated with machinelike precision. On this night, he was clearly multi-tasking -- answering questions and expounding on complex technologies without so much as a pause for a breath, his eyes all the while parsing the salmon entree before him. (He takes eating very seriously indeed. His previous book, "The 10 Percent Solution for a Healthy Life," was about nutrition, specifically about a low-fat diet he put together to battle his own congenital heart disease.) The "stuff" he's talking about is no less than a physical hybrid of human beings and their technology. He says the machines being created today are the beginning of our metamorphosis from thinking mammal to all-knowing hybrid. Biological evolution has already given way to much more rapid and less random technological evolution, Mr. Kurzweil argues. And within 30 years, he predicts, direct links will be established between neurons in the human brain and computer circuitry. The implications are mind-boggling. Such links would mean that the entire contents of a brain could be "insubstantiated" -- copied (and preserved) in an external database. Not only would the brain's biological capacity be supplemented with enormous amounts of digital memory, it would also be linked to vast information resources like the Internet at the speed of thought. And it would produce, through direct neural stimulation, a virtual reality indistinguishable from objective reality. Mr. Kurzweil cites medical treatments in which silicon chips have been successfully implanted in human brains, for example, to alleviate symptoms of Parkinson's disease, or been made to communicate with neurons, as they do in cochlear implants for the deaf, as examples of primitive steps toward his predictions. While these sorts of visions might seem far-fetched, other respected futurists find Mr. Kurzweil's ideas compelling. Marvin Minsky, Toshiba professor of media arts and science at the Massachusetts Institute of Technology, has called him "a leading futurist of our time," while the techno-guru George Gilder says, "This book makes all other roads to the computer future look like goat paths in Patagonia." That Mr. Kurzweil's theories are given a serious hearing is testament to his credentials. Since his teenage years he has been harnessing computer power to "pattern recognition," which Mr. Kurzweil describes as "that part of the artificial intelligence field where we teach computers to recognize abstract patterns, a capability that dominates human thinking." In 1965, at age 17, his music composing program won a Westinghouse science award, a visit to the White House and a spot as a contestant on the old television game show "I've Got a Secret." (Young Ray's secret stumped the former Miss America, Bess Myerson, but was guessed by the second panelist, the actor Henry Morgan.) By the time he graduated from M.I.T. in 1970, Mr. Kurzweil had already achieved his first business success, having founded a computer database service that helped high school students choose the right college. That endeavor, which he sold for $100,000, was followed by a string of successful businesses built on his inventions. Among his best-known is the Kurzweil reading machine for the blind, which was a true marvel when it was introduced. CBS News was so impressed with the device that Walter Cronkite used it to deliver his signature sign-off, "And that's the way it was, on Jan. 13, 1976." Along the way, Mr. Kurzweil has won a raft of accolades in both business and academia and received nine honorary doctorates. Today, in addition to writing his next book, he is developing Fat Kat, an artificial intelligence system that applies evolutionary algorithms to securities investment decisions. In Mr. Kurzweil's vision of the future, the man-machine hybrid will be accomplished not through some Frankenstein-like amalgam but through an elegant technology: microscopic, self-replicating robots called nanobots that will be introduced through the bloodstream and will interact with individual neurons throughout the brain. "The idea," Mr. Kurzweil said, "is to direct nanobots to travel through every capillary in the brain, where they will pass in very close proximity to every neural feature." This, he says will enable the tiny machines to scan each neuron and "build up a huge database" -- basically, the entire contents of a brain. "And all these nanobots would be communicating with each other," he said. "They'd basically be on a wireless network. They could also be on the Web and communicating with computers maintaining the database outside the brain." The breakthrough in nanotechnology came several years ago with the discovery of the nanotube, a carbon molecule of enormous strength. Just about anything can be fabricated from nanotubes, at many times the strength and at a fraction of the weight possible with conventional materials. What's more, nanotubes have a far greater capacity for raw computing power than the commonly used silicon. This combination of features holds out the possibility of building machines no larger than a blood cell that are fully programmable and perhaps even able to construct replicas of themselves from carbon atoms. The size of the technology is shrinking so rapidly, Mr. Kurzweil says, that "within 30 years, both the size and cost of this scenario will be feasible." Of course, such technology would inevitably be accompanied by terrifying dangers. By scanning a brain into a database, a person's most private thoughts and memories would be vulnerable to intrusions by hackers. And wouldn't the brain also be vulnerable to external control of information, thought processes and even perceptions of reality? "Those are real concerns," Mr. Kurzweil admits. "Organizations like governments or religious or terrorist groups or just clever individuals could put nanobots in food or water supplies, trillions of them. These would then make their way inside people and would monitor their thoughts and even could control them and place them into virtual environments." But he adds: "We won't be defenseless. We have these concerns today at a primitive level with Trojan horses that make their way into our computers." In any case, Mr. Kurzweil says there is no turning back. Once evolution produced a technological species, it locked us into a relentless quest for understanding and control of our universe. "I tend to be optimistic, but that's more of a personal orientation than something I could scientifically argue for," he admits. "There definitely are dangers, and we do tend to address them imperfectly, so there is some possibility that this will fail." http : // www.nytimes.com Correction An article in Arts & Ideas on Saturday about the possibility of physically linking the human brain to computers misstated the medical condition of Ray Kurzweil, the author of a book on the subject. He wrote a previous book about nutrition because his family has a history of heart disease; it is not he who has congenital heart disease. Correction-Date: November 9, 1999, Tuesday Graphic Photo: Ray Kurtzweil, author of a new book, "The Age of the Spiritual Machine: When Computers Exceed Human Intelligence," in his office in Wellesley Hills, Mass. (Michael Lutch for The New York Times) Load-Date: November 6, 1999 End of Document Made in the U.S., By Motorola The New York Times

Time: 21/12/2012  
 When the Mayan "Long Count" calendar ends on Friday, December 21, some people predict it could mark the end of the world as we know it. But despite the attention that December 21 is garnering, many apocalyptic believers don't actually give much thought to the hype surrounding the Mayan calendar. Some doomsday believers pinpointed 2012 as a pretty good year for disastrous solar flares, giant asteroids or global pole shifts that could likewise signal the apocalypse. Other theories that may or may not happen this year involve the Rapture, the catastrophic collapse of civilization or even a zombie uprising. There is diversity among apocalyptic "prepper" groups, and to paint them all with a broad stroke of the crazy brush is to ignore the nuances in what these various groups believe. John Hall, author of "Apocalypse: From Antiquity to the Empire of Modernity," said groups organized around 2012 end-of-world predictions -- driven by pseudoscientific or numerological predictions -- are "more fanciful" than some other doomsday believers. That's because they look toward dramatic external events, as opposed to others that approach theories with a "fair amount of scientific basis," such as the disappearance of natural resources. Although Hall and his colleagues have spent years trying to define or connect them, the groups can be as hard to explain as their disparate beliefs. "It's not like a pie of apocalyptic stories that can be divided up so much as it is a story where people coming from many different places can ... express the urgency of the crisis they foresee," Hall said. For instance, Hall said the survivalists -- both those of the fundamentalist religious persuasion and the nonreligious -- are looking to opt out of post-apocalyptic strife. That analysis applies to Dan Martin, a survivalist living off the grid and author of "Apocalypse: How to Survive a Global Crisis," a book that teaches skills for living a self-sufficient life after what he perceives to be an oncoming collapse of civilization and governments. He said his readers are "normal middle-class" soccer moms and teachers who read about world events and "connect the dots." "Most of my readers aren't die-hard, end-of-the-world subscribers or enthusiasts," he said. "They don't want things to change, but aren't ignorant to the fact that they most likely will within our own lifetime, so preparing for such a strong possibility isn't desperation or ignorance or naivety, it's just another insurance policy." Insofar as civilization's collapse is something we're bringing upon ourselves with a little help from world powers, Martin and his readers might relate to radical environmentalists or peak oil environmentalists, who subscribe to the theory that there is a date when petroleum production will max out and decline rapidly. Hall sees a connection between the survivalists and religious rapturists who "look at themselves as missing out on the agonies of the apocalypse because they're going someplace else." Jerry Jenkins, co-author of the "Left Behind" book series about the Rapture within the Christian Bible's end-of-days Book of Revelation, doesn't completely agree with Hall's assessment. He said the media has incorrectly portrayed his readers as triumphalists who boast "We're going, you're not, too bad for you." The whole point of the "Left Behind" books, Jenkins said, was to encourage people to read the Revelation prophecies because religious rapturists want all people to have a better life in heaven. "[We're not] saying 'good' people go and 'bad' people are left behind," said Jenkins, who believes the key to being raptured (or taken into heaven before the Apocalypse happens on Earth) is to receive Jesus Christ. But Jenkins added that even those "looking forward to being rescued" are still dedicated to improving life for everyone on terra firma before they go. Interestingly, Jenkins said Christ himself said he didn't even know the day or hour of the Rapture, so the ilk of Christian radio broadcaster Harold Camping who attempt to predict its timing are "crazies" engaged in folly that "make us all look like idiots." Camping claimed he was able to use the Bible to calculate the exact date of the Rapture (most recently it was supposed to be May 23, 2011, and before that in 1994). Those who point to science instead of Biblical lore to predict the end of the world are another apocalyptic subculture, according to Hall. These groups are comprised of theoretical physicists and futurologists -- such as Michio Kaku -- whom Hall calls "optimistic utopian prophets." These people believe in the Technological Singularity theory: The possibility that technologically augmented intelligence will change human life as we know it or possibly wipe it out completely. There's even a think tank of sorts formed around this logic. The Singularity Institute is comprised of scientists, philosophers and philanthropists from places such as the Research Triangle and Silicon Valley, and universities such as Oxford, Harvard and Stanford, said Michael Anissimov, media director at The Singularity Institute. Their goal? Constructing a smarter-than-human intelligence that has the values of humanity. Instead of avoiding the growth of artificial intelligence, the Singularity Institute is trying to manage the risk. If peak oil theorists believe we're rapidly running out of a major resource, the institute postulates that technology itself is advancing so rapidly that society will have an overabundance of it -- and an artificial intelligence is set to emerge that will not necessarily pursue mankind's best interests. "We do think it's possible, if not probable, that it could actually lead to either the marginalization or end of humanity," said Anissimov. Whereas religious and scientific apocalyptic subcultures converge and diverge on various points, there is one end-of-world scenario that manages to reflect all their anxieties: the zombie apocalypse. The zombocalypse of popular culture has become something of a Rorschach test of apocalyptic fears. Depending on the point of view, zombies may result from an act of God, the irresponsible use of science, an environmental disaster, a cosmic event and so forth. Scott Kenemore, author of "The Zen of Zombie" and a member of the advisory board of the Zombie Research Society, said the zombie apocalypse can represent a validation of sorts for people awaiting their particular extinction event. Hall agreed that the pop-culture connection of zombies to apocalyptic groups is "a shared motif of a dystopian world emerging." He added that zombies are a stand-in for "The Other," an alien group, process or force that is "almost always" the basis for apocalyptic developments. Zombies can be a substitute for a corrupt government, an oil-based economy, foreigners or even a Sodom and Gomorrah society itself. "[H]ow you deal with the threat is an open question," he said. Whatever route to the end (or new beginning), Hall thinks the very diversity of subcultures underscores the fact that we have reached an apocalyptic apex. "In this moment, people are seeing the old ways of life recede," he said. "That's the occasion when all kinds of different people from all kinds of different directions come forward with one or another apocalyptic scenario." Load-Date: December 22, 2012 End of Document The 10 best video games of 2012 CNN Wire

Time: 25/06/2001  
 apparently she's part of this fictional university called Bangalore University, and there are all these links, it's like -- it's is a labyrinth of sites. SYLVESTER: We went searching for signs of intelligent life with Brandon Gray from Zap2it.com. GRAY: If you go to Google.com, which is a search engine, and if you type in "Jeanine Salla," you'll be taken to a number of sites. I believe this is the group that's trying to liberate the robots or the artificial intelligence, so that they have the same rights as human beings. This is the Coalition for Robotic Freedom, is the name. You'll find links to the actual fan sites that are trying to figure this whole thing out. Like, here's this Yahoo! club about the Jeanine Salla conspiracy. SYLVESTER: "Planet of the Apes" has gone into cyberspace with a real-life scavenger hunt. Click on "Project Ape" to find coordinates to use with a global positioning satellite. Props from the film and other prizes can be found around the world. GRAY: Mission number four: Southern Bowl. It's hidden somewhere in South America. SYLVESTER: No one knows who is playing this game, or another, operation "Swordfish." Here, cracking the code requires watching the film's final credits. For the studios, it's cheap cross-promotion. SCHATZ: They've managed to create this whole online world, and people go to these Web sites and have started all of this buzz and interest around the movie without having to purchase extra commercials, extra TV time, extra trailer time. SYLVESTER: But is it all just an elaborate tease? The "A.I." searchers called cloudmakers say watch for the eyes to spot a web of deceit. UNIDENTIFIED MALE: It will pop up right here. See that? You get two little blue eyes, the "A.I." eyes of Haley Joel Osment. SYLVESTER: So we asked Osment about Jeanine Salla. HALEY JOEL OSMENT, ACTOR: I actually didn't have that much work with her because she's postproduction. SYLVESTER: Maybe a case of artificial intelligence. (END VIDEOTAPE) TUSH: For more on how the big summer movies did this weekend, catch our next "Showbiz Today Reports" in the 11:00 hour. I'll be here with our box office analyst, the always jolly Marty Grove. I'll see you then. TO ORDER A VIDEO OF THIS TRANSCRIPT, PLEASE CALL 800-CNN-NEWS OR USE OUR SECURE ONLINE ORDER FORM LOCATED AT www.fdch.com Load-Date: July 11, 2003 End of Document Studios Use the Web in Creative Ways to Promote Movies CNN CNN NEWS SITE 16:00

Time: 01/09/2002  
the de facto end of summer upon us, there is a natural tendency for the pulse to quicken, for the mind to snap out of repose and for debate to begin on the immediate burning questions of the fall. Will an invasion of Iraq come before Christmas? Which fashion fad will we succumb to first -- pencil skirts or rugby shirts? The Web site Longbets.org urges a longer -- and less idle -- view. Designed to sharpen long-term thinking on issues of social or scientific significance, the nonprofit site (a spinoff of the Long Now Foundation, headed by veteran Silicon Valley pundits Stewart Brand and Kevin Kelly), solicits prophecy backed by currency. To divert gamblers and kibitzers from the mesmerizing press of the next five minutes, the minimum bet is $1,000 and the minimum period is two years. Bets are tax deductible and winnings (all in good time) go to a charity of the victor's choice. Since its debut in April, Longbets has published 11 bets on topics ranging from where alien life will be discovered to when commercial planes will regularly fly without pilots. The prognosticators with deep pockets include technology executives, scientists, writers, philosophers -- and the actor Ted Danson. Both sides must post a defense of their position, and anyone can participate in the ensuing online discussion. Before the short-range seduction of September kicks in, then, here are excerpts from conflicting visions of a more distant future, and some wagers still in search of a taker. AMY HARMON The biggest bet (so far) "A computer or 'machine intelligence' will pass the Turing test by 2029" Most Longbettors stick to the minimum stake of $1,000 each. Here Mitchell Kapor, the founder of Lotus Development, explains why he was confident enough to wager a $10,000 that no computer in the next 27 years will be able to impersonate a human well enough to fool a human judge (the Turing test): While it is possible to imagine a machine obtaining a perfect score on the SAT or winning Jeopardy -- since these rely on retained facts and the ability to recall them -- it seems far less possible that a machine can weave things together in new ways or to have true imagination in a way that matches everything people can do, especially if we have a full appreciation of the creativity people are capable of. . . . Computers look relatively smarter in theory when those making the estimate judge people to be dumber and more limited than they are. Ray Kurzweil, an artificial intelligence pioneer and entrepreneur, on why he is equally sure Mr. Kapor is wrong (and why he believes the $20,000 total will go to his selected charity, the Kurzweil Foundation): The brain is self-organizing, which means that it is created with relatively little innate knowledge. Most of its complexity comes from its own interaction with a complex world. Thus it will be necessary to provide an artificial intelligence with an education just as we do with a natural intelligence. But here the powers of machine intelligence can be brought to bear. Once we are able to master a process in a machine, it can perform its operations at a much faster speed than biological systems. As I mentioned, contemporary electronics is already more than 10 million times faster than the human nervous system's electrochemical information processing. Once an AI masters human basic language skills, it will be in a position to expand its language skills and general knowledge by rapidly reading all human literature and by absorbing the knowledge contained on millions of Web sites. . . . The longest bet (so far) "At least one human alive in the year 2000 will still be alive in 2150" Unless one of the bettors turns out to be the human in question, they'll never know who won. But according to the rules of the service, which is set up to be administered for several centuries, Longbets will award the winnings in 148 years "with great fanfare." Peter Schwartz, a futurist, makes a case for scientific progress: If one simply looks at the historical trend, one finds that over the last century, we have nearly doubled human life span. The average lifespan of human beings (average, not maximum) has gone from about 45 to about 85. With the advances in microbiology and molecular biology, there's no reason to imagine that we won't do at least as much in the next century. . . . Melody K. Haller replies with her own unique interpretation of Darwin: Humans may succeed in overcoming self-limiting life spans but the result is likely to be contra-indicatory to the continued success of humans and other life. . . . I am betting money against his prediction purely because I believe that the further radical prolonging of human (and pet) longevity would not benefit the human species. . . . The sports bet "The U.S. men's soccer team will win the World Cup before the Red Sox win the World Series." Nestled in among propositions on the fate of the universe and the likely future Nobel Prize, this bet might seem to flout the "social or scientific significance" rule, but Mike Elliot, an editor-at-large for Time magazine, somehow manages to wrap in globalization and metaphysics: As immigration and technology continue to make the U.S. a more international nation, so the quality of its soccer team will continue to increase. Already, American teenagers can hold their own with players from more established countries, while players like Claudio Reyna and Kasey Keller have become acknowledged international stars. The Curse of the Bambino, on the other hand, is one of those mystical truths that are beyond the reach of human intervention. Cheers, Ted. Perhaps not one for intellectual pretense, Ted Danson, who played a retired Red Sox pitcher on the sitcom "Cheers" for 11 seasons, grounds his reply in pragmatism: The Red Sox have had such bad luck in the 20th century, I have to believe that in the new millennium it can only get better. Besides, statistically, scoring goals is harder than hitting a home run, and in the World Cup, you have the whole WORLD against you, but in baseball, the Red Sox only really have to beat the Yankees. Count on a discussion group participant, "micromike" to return to more sober astronomical postulation. In a post titled "I feel bad for Danson," he writes: It must be hard living a delusional life thinking that Boston will ever win the World Series!!! A team from outer space will win the series before Boston does. . . . Tired of the future? Ready to embrace back-to-school shopping for things you can use, say, next week? But wait, before deliberations begin on what's for dinner, say, tonight, here's a sampling of the more than 20 bets that remain open. Any can be joined with $1,000 and a few clicks at www.longbets.org. \* By 2100 a world government will be in place and in control of: business law, environmental law and weapons of mass destruction. \* By 2020, bioterror or bioerror will lead to one million casualties in a single event. \* By the year 2015 solar electricity will be as cheap or cheaper than that produced by fossil fuels. \* By 2030 all surgical anesthesia will be administered and monitored by computers, with no need for professional medical supervision beyond the surgeon. \* By 2050, we will receive intelligent signals from outside our solar system. \* By 2070, at least six countries will have officially implemented a 4-day working week. http : // www.nytimes.com Graphic Photo: You'll need more than a quarter to play these numbers. (Andrea Mohin/The New York Times) Load-Date: September 1, 2002 End of Document Cognitive Rascal in the Amorous Swamp: A Robot Battles Spam The New York Times

Time: 13/04/2005  
On Language, Learning, and Artificial Intelligence. By Roger C. Schank with Peter G. Childers. 268 pp. Reading, Mass.: Addison-Wesley Publishing Company. $17.95. THE KNOWLEDGE MACHINE Artificial Intelligence and the Future of Man. By Donald Michie and Rory Johnston. 300 pp. New York: William Morrow & Company. $16.95. O VER 25 years ago, computer science produced a discipline called artificial intelligence. Its goal was to simulate the human thinking process on a computer. But as initial advances became known, such as programming a computer to outwit master chess players, many people feared that humans could be replaced by sturdy, tireless and imperturbable silicon reasoning machines. That fear was perhaps most eloquently articulated in 1961 by Adrienne Rich in ''Artificial Intelligence,'' a poem addressed to a chess-playing computer: Still, when they make you write your poems, later on, who'd envy you, force-fed on all those variorum editions of our primitive endeavors, those frozen pemmican language-rations they'll cram you with? denied our luxury of nausea, you forget nothing, have no dreams. As time went on, however, it became clear that computers were hopeless at doing many things humans could do easily. A chess-playing computer didn't know anything about things that we are perhaps born knowing - for example, that if an object is in one place it isn't also in another. Computers of the sorting and calculating type, however, rapidly encroached on our daily lives. They generated the bills we got, the airline reservations we made and the loans we took out on credit cards to buy dinners. But they didn't dazzle or transform lives in any meaningful way. Consumers weren't even cowed by warnings that our children would suffer in the job market if they weren't ''computer literate.'' Scientists succeeded in making computers perform some activities that seemed to be intelligent behavior -medical diagnoses for example - but still seemed far from complex human reasoning. ''The Cognitive Computer,'' by Roger G. Schank with Peter G. Childers, and ''The Knowledge Machine,'' by Donald Michie and Rory Johnston, offer inside views of current research in artificial intelligence. Mr. Schank is one of the founders of the group studying artifical intelligence at Yale University, where some of the most significant work on computer comprehension of human language has been done. Donald Michie is the dean of the artificial intelligence movement in England and a leader in developing so-called ''expert systems.'' Their books, each written with a nonscientist, are cogent accounts of different approaches to machine intelligence. ''The Cognitive Computer'' is clear, funny and smart about the central problems involved in trying to get computers to mimic human reasoning. Mr. Schank sets the reader at ease immediately. The reason to care about computers, he tells us, ''is that they might contribute to daily life by providing some kind of service.'' He adds, ''If you can't use computers without pain, then just wait. It's the computers that will have to change, not you.'' He says that his work on computer comprehension of human language is basic research on the big problem, the one that has stumped philosophers since Plato and Aristotle - how does the mind work? He believes that ''if computers gain any semblance of intelligence, it will be because we have begun to unravel some of the mysteries of human intelligence and model them on the computer.'' Whether computers will ever really ''think'' like people is not an interesting question to him. He wants to build ''intelligent machines, not people.'' But for such a machine to be useful, it has to be able to talk with people in their own language. To do this, it has to ''know'' a great deal about people's motives and desires, how they plan and how they reach their goals. Mr. Schank has developed a bare-bones way of describing for a computer what happens beneath the surface of language and other human behavior. His formulas allow the computer to draw inferences from certain situations. Suppose the computer is told a story about a person ordering food in a restaurant. Through the use of a specially designed parsing program, Mr. Schank's computers are able to correctly analyze sentences in that context. They would know, for example, that the word ''tip'' in a restaurant story would refer to money and not to the pointed end of something. The computer has proved enormously helpful in efforts to understand the mind, Mr. Schank believes, because it is the theory-tester Plato and Aristotle did not possess. The computer knows nothing before it is programmed, so its mistakes point out mistakes in the formulas according to which it is programmed. Take the program ''Tale-Spin,'' which tried to get the computer to make up stories out of a group of concepts and a set of rules on how to use those concepts. Mr. Schank quotes one of Tale-Spin's first efforts: ''One day Joe Bear was hungry. He asked his friend Irving Bird where some honey was. Irving told him there was a beehive in the oak tree. Joe walked to the oak tree. He ate the beehive.'' Mr. Schank comments that ''since the program contained a conceptual representation for 'source of food' we merely told it that 'beehive' was one. 'Beehive' is indeed a source of food, but we forgot to mention that 'source as container' is different from 'source as object.' Finding a refrigerator will do when you are hungry, if you know to look inside it, and not to eat it. None of this is obvious to a machine.'' By now, research has evolved to the point where computers can ''make sense'' of events, according to Mr. Schank, and he expects that within the next few years computers will be able to serve as financial and medical advisers. Later we can expect sophisticated learning systems that know the principles of cooking and are able to invent dishes according to individual whims. In 10 years, Mr. Schank predicts, the machine will be able to explain why it came to the conclusions it did, what lines of reasoning it rejected and why it rejected them. But computers will never have empathy for human beings, he notes, because human ''output'' at the level of empathy cannot easily be put into words or ''representations.'' For example, ''what happens when the output is a kiss or a backrub, or a wonderfully cooked dinner, or a vase of flowers?'' The central theme of ''The Knowledge Machine'' is that in an increasingly complex world we need all the sources of knowledge we can get, including machines. Donald Michie makes his case by surveying the accomplishments in ''expert systems'' or ''knowledge-based systems.'' These are sets of computer software that contain the knowledge of an expert in a particular field. For instance, some programs now capture the expertise of one or several experts in chemical synthesis, oil exploration or the design of computer systems. Expert systems combine textbook knowledge with the rules of thumb that experience teaches, and then make informed guesses. They work tirelessly, often with higher accuracy rates than human beings can achieve. It is beyond dispute that expert systems can be helpful, Mr. Michie says, and he also contends that a properly engineered system can ''create'' knowledge by taking fragmentary, inconsistent and error-ridden information and turning it into something more precise, reliable and comprehensive. He cites the case of ''dendral,'' a program designed to help organic chemists determine the molecular structure of compounds. Chemists who knew of it asked for copies, not of the program, but of the rules the program had assimilated. ''They found these rules useful,'' he says, ''because they were a much clearer codification of the subject than had existed before.'' Mr. Michie calls this byproduct of expert-system engineering ''knowledge refining,'' and he finds it has already improved medical texts and suggested new assembly techniques in automation. He envisions ''machine-based craft shops set up for the sole purpose of generating new knowledge, using as their raw material both the expertise of humans and the ruminations of huge computer models and look-ahead systems.'' With such a ''knowledge refinery,'' one could begin to ''sort out the many man-centuries of mental work,'' that ''gather dust on library shelves - contradictory, disparate and indigestible'' and turn it into ''accurate usable knowledge.'' M R. MICHIE sees great danger ahead if science fails to design machines that don't convey knowledge in forms humans can grasp. He argues that efficient machines, if they are a mystery to humans, can actually slow things down. He cites a commentary on the installation of a highly automated hot strip mill by a Dutch steel company: ''The operators became so unsure of themselves that, on some occasions, they actually left the pulpits used for control unmanned. . . . [They] also failed fully to understand the control theory of the programs used in the controlling computer, and this reinforced their attitude of 'standing well back' from the operation - except when things were very clearly going awry. By intervening late, the operators let the productivity drop below that of plants using traditional control methods. So automation had led to lower productivity and operator alienation simultaneously.'' In the Information Age knowledge is an instrument like money. It's not an end but a means. The work described in these books is an attempt to diffuse knowledge as widely as possible, making it accessible to the many rather than the few. Given that the right information at the right time can change a person's life, the story of how scientists intend to capitalize on the computer's lust for order to bring it to us is very exciting. Graphic Drawing End of Document Oren Etzioni The New York Times

Time: 12/09/2005  
Heroes of the Computer Revolution. By Steven Levy. 458 pages. Anchor/Doubleday. $17.95. There was the great chess showdown of 1965, when MacHack won a chess game against a critic of artificial intelligence named Herbert Dreyfus, who had bluntly asserted that no computer program would ever be able to beat even a 10-year- old. None of the computer specialists at the Massachusetts Institute of Technology cheered when the program won, because they knew it was going to happen. They lived in the world of hackers, a mere extension of the incredible computer environment. There was the Great Subway Hack, in which an M.I.T. student programmed a computer to figure out a route by which someone could ride the entire New York City subway system on a single token, and then a bunch of his fellow students went out and actually did it. And there was the incident when the security people in charge of M.I.T.'s Artificial Intelligence laboratory had to ask one of the hackers to crack a safe that had been acquired precisely to secure certain information from the hackers, who regarded any secret as an insult to their ingenuity. A remarkable spirit of fun and adventure prevailed at M.I.T.'s Artificial Intelligence lab in the 1950's, and Steven Levy has captured it alive in the opening section of his ''Hackers: Heroes of the Computer Revolution.'' He has introduced and made us understand those weird kids ''with owl- like glasses and underdeveloped pectorals who dazzled math teachers and flunked PE, who dreamed not of scoring on prom night, but of getting to the finals of the General Electric Science Fair competition.'' No wonder they evolved such a peculiar style of living, with nonstop 30-hour work sessions, and forays deep into the arcana of the Cambridge Chinese-restaurant system, and a colorful jargon full of odd, teddy-bearish words like ''winnitude,'' ''gronk,'' ''foo'' and ''milliblatt'' (the last coined to designate a new ''olfactory measure'' in honor of a particularly ''grungy'' hacker named Greenblatt). They were a unique band of adventurers. And if the spirit of ''Hackers'' is sometimes reminiscent of Tom Wolfe's ''Right Stuff,'' it is neither a coincidence nor a result of imitation. If Mr. Wolfe's test pilots and astronauts were pushing back the boundaries of outer space, then Mr. Levy's heroes are just as courageously exploring mindspace, an inner world where nobody had ever been before. Why then does Mr. Levy's book begin to limp halfway through - to bog down in details that are somehow less and less exciting? Partly it has to do with the decline and death of what Mr. Levy calls ''the hacker ethic,'' which is what his book is really all about. The M.I.T. hackers believed that working with computers was an end in itself, that whatever they discovered was to be shared with anyone else who was interested, that there were no secrets and that no one was to earn a profit. Mr. Levy captures this spirit wonderfully, and its inevitable decline is a depressing thing to witness. But if he tells a story of decline, he also tells one of diminishing significance. Mr. Levy divides his history into three sections, covering three phases of the computer revolution, and each seems more trivial than the one preceding it. The first, as will be evident by now, focuses on the groundwork that was done during the 1950's and 60's by the whiz kids at M.I.T. From there the scene shifts to California in the 1970's, where out of the counterculture's search for an anti-establishment technology there evolved the microcomputer business in general and Stephen Wozniak's highly profitable Apple II in particular. This too may be an important chapter in the evolution of the home computer. What's more, the commercial success of the Apple computer may well have been a step in the decline of the hacker ethic, which certainly didn't include profiting hugely from one's discoveries. But somehow in telling this part of his story, Mr. Levy, who covers technology for Rolling Stone magazine, loses his perspective, for it's hard to tell whether he is celebrating the arrival of an inexpensive home computer or lamenting its astonishing profitability. Finally, when he arrives at the third phase of his story - the adventures of the ''game hackers,'' or those programming prodigies who put their genius into translating video games like ''Frogger'' from one computer system to another - he appears to have lost his way completely. For if, as the shape of Mr. Levy's book implies, the point of the entire computer revolution was to try to get a frog across a road and stream without being either run over by trucks or eaten by crocodiles, then it's not only unsurprising that the hacker ethic died; it isn't even sad. Still, it's a remarkable collection of characters that Mr. Levy has gathered in these pages - from the hacker who, purely for the challenge, programmed a computer to be ''an expensive typewriter'' (or what turned out to be one of the first word processors) to the demon telephone hacker, Captain Crunch, who discovered that when one blew the whistle that came in the breakfast cereal of that name, the result was the precise 2,600-cycle tone that the phone company used to shuffle long-distance traffic over its lines. And it's significant history that lies buried beneath all the gossip - the story of how the hackers nearly won out over the bureaucrats, who were forever symbolized in the hacker mind by the hulking giant of International Business Machines. The irony was that I.B.M. eventually turned out to be the biggest hacker of them all, when it came up with a microcomputer that nobody thought it was capable of producing. And how did I.B.M. accomplish this? That is probably an interesting story. But it doesn't fit into the thesis of Mr. Levy's book, which is simply that the hacker spirit grew corrupted by wealth and power. So instead of writing about what happened on the forefront of the microcomputer revolution, he ends up writing about frogs and mazes. Graphic photo of Steven Levy End of Document Google Searches Get Personal The New York Times

Time: 08/09/2002  
can't ask more of a teddy bear than to save a lock of Mom's hair for 2,000 years. Many people either love Teddy's movie -- Steven Spielberg's A.I.: ARTIFICIAL INTELLIGENCE (2001) -- or despise every minute of it, but who could resist the little bear (with the deep, grown-up voice of Jack Angel), a supertoy who sticks by his owner to the end? The owner is David (Haley Joel Osment), a little-boy robot who can be adopted by humans and programmed to feel love. Unfortunately, when his adoptive parents' human son finally comes out of his coma, David can't be deprogrammed. In some ways this is two films: the Kubrickian first half (sterile serenity) and the Spielbergian second half (honky-tonk future Vegas). And it's now clear why the movie doesn't end after the Blue Fairy encounter: it would have robbed Teddy of his big moment -- Saturday at 10 p.m. on Cinemax. War has to be terrifying for children, but they can make magic almost anywhere. When World War II begins, in John Boorman's dreamlike HOPE AND GLORY (1987), Billy (Sebastian Rice-Edwards) and his friends turn their bombed-out London neighborhood into a pretend world where it's O.K. to smash things up. Even his teenage sister, Dawn (Sammi Davis), feels childlike. "It's lovely!" she shouts as the blitz hits the neighborhood. "Come and see the fireworks." Life is grimmer for the adults, like Billy's mother (Sarah Miles), but they manage to cherish family and the circle of life while the lights in Europe are going out all around them -- Sunday at 2 p.m. on IFC. Fletcher Reede (Jim Carrey), a proudly devious lawyer, knows something is wrong when after a first-time sexual encounter he hears himself tell his bed partner, "I've had better." In Tom Shadyac's LIAR LIAR (1997), this is the beginning of Fletcher's inability to tell an untruth for 24 hours. (His son, played by Justin Cooper, wished for that on his 5th birthday and blew out all the candles.) For Fletcher, being able to tell only the unvarnished truth is a problem in the courtroom, and Mr. Carrey makes his character's torture (he repeatedly objects to himself) a joy to behold -- Thursday at 8 p.m. on Channel 7. It's all so simple, Cary Grant tells the hotel manager in MY FAVORITE WIFE (1940), but he just can't seem to explain. You see, his beloved wife, Ellen (Irene Dunne), disappeared seven years ago after a shipwreck off the coast of Indochina. Nick (Grant) finally has her declared legally dead and marries Bianca (Gail Patrick). But on their wedding day, Ellen turns up, having been rescued from a remote island. Oh, and there's a handsome man who was also on that island all those years. It's delicious, de-lovely romantic comedy, directed by Garson Kanin, that old rascal -- Saturday at 10:55 p.m. on Channel 13. David (Tobey Maguire), a stressed-out 90's teenager, yearns for the serene, predictable 50's "Father Knows Best" world that he sees in reruns of his favorite sitcom. But he's not at all pleased when a magic television remote transports him and his enthusiastically trampy sister (the fabulous Reese Witherspoon) into that black-and-white world in Gary Ross's PLEASANTVILLE (1998). At first they want out; then they begin to introduce new concepts (like sex, art and rain) to the locals. David questions doing this, since these people seem happy the way they are. "No, David," Ms. Witherspoon's character explains. "Nobody is happy in a poodle skirt and sweater sets" -- Friday at 8 and 10:30 p.m. on TNT. http : // www.nytimes.com Graphic Photos: Sebastian Rice-Edwards and Geraldine Muir in "Hope and Glory." (Columbia Pictures); Haley Joel Osment and Frances O'Connor in "A. I.: Artificial Intelligence"(2001). (David James/Warner Brothers and DreamWorks) Load-Date: September 8, 2002 End of Document BULLETIN BOARD The New York Times

Time: 13/09/2010  
The highest compliment I can pay Halo: Reach, set for release Tuesday for the Xbox 360, is to say that as soon as I finished it, I wanted to return to November 2001 and start the Halo saga all over again. I wasn't paying much attention to game consoles back then. I had hunkered down in New York City that difficult autumn with Internet PC games like Diablo II, and when Microsoft introduced the original Xbox that month, the news didn't really register with me. But even in my online worlds (consoles were rarely networked back then), I almost immediately heard about Halo: Combat Evolved, the big new science-fiction shooter that Microsoft had released alongside its new game machine. It was immediately obvious that Halo was the Xbox's killer app: the essential new experience that drives people to buy new technology. And that was because Halo was the first truly modern first-person shooter on any console. (GoldenEye 007 for the Nintendo 64 was not as advanced.) After years of development on the PC through franchises like Doom, Quake and Unreal, someone had finally figured out how to make a real shooter -- an exciting, story-driven one at that -- on a living-room console. So it is fair to say that the entire Xbox franchise would not be the success it is today if not for the Halo series. And yet until now I was never quite a fan. And that is because, I have to admit, that as a PC gaming snob, I have always struggled at some level to take console shooters seriously. And last year's lackluster Halo 3: ODST cemented my skepticism about the whole Halo experience. But now Reach has cured me. You could call it ''How I Learned to Stop Worrying and Love Halo.'' The development studio Bungie invented Halo, but is now leaving it behind after Reach. (Microsoft will retain the brand while Bungie moves on.) For its last go-round with its most famous franchise Bungie has produced a superbly enjoyable science-fiction combat romp. In my ODST review last year I described Halo as ''the consummate middlebrow science-fiction space opera with a lot of fun in the shooting but without much wit or character.'' Reach casts the same elements in quite different proportions: the shooting and combat are so much fun and look so attractive that you stop caring about wit or character. You get to run and fly around spectacular virtual environments while firing all manner of high-powered futuristic weapons at computer-controlled aliens or other players online. And you get to do it in style and comfort. What more do you want from a game like this? Reach is actually set as a prequel to the previous Halo games, so you won't be seeing or playing as the faceless Master Chief character that has become the series hallmark. Instead, Reach tells the story, in 2552, of the beginning of humanity's war with the alien species called the Covenant. Instead of Master Chief you play as the even more cipherlike Noble 6, a member of the space commandos called the Spartans (naturally). The earlier Halo games annoyed me with mawkish dialogue and some loony, over-the-top storytelling. Reach tones down its attempts at emotional connection and finds itself in fewer awkward situations of forced melodrama. Bungie is allowing Reach's fairly typical cast of characters to fade into the background a bit, which is where they belong. There are moments of self-sacrifice and loss, but Reach doesn't oversell them. So I found myself stop trying to take them seriously. Instead I was able to focus my attention in the roughly 10-hour single-player campaign squarely where it belongs -- on the slick visuals; the fabulous environment design; the admirably realistic and varied artificial intelligence; and the tight, polished combat mechanics. If there's anything I can't stand in flat-out combat shooters it is tunnels. (A survival-horror-type game is different.) Put me in a tunnel, shooting guys coming at me for more than a minute, and I start to frown. There are almost no tunnels in Halo: Reach. At its best Reach sets you on one end of fairly open battlefields, with lasers and missiles flying everywhere and humans battling aliens all over the place, and it tells you: Get to the other side. You may have to trip some switches along the way or accomplish some other objective, but the game offers the player a wide range of tactical flexibility in conquering obstacles. You might prefer a shield or healing power for your armor, or you might choose to project a holographic image to confuse the enemy. Combine such abilities with an assortment of weaponry from shotguns to sniper rifles, as well as enemies who hunt you intelligently, and you have an excellent combat game. And, this being a Halo game, it doesn't limit you to your feet. Tanks, gun-festooned hovercraft and even small spaceships are yours to command. I tried only a few matches online in multiplayer mode, but it should almost go without saying -- given Bungie's track record -- that the play seemed smooth and the matchmaking options both varied and robust for competitive and cooperative play. Like recent Call of Duty games, Reach will certainly find its real legs online. After all of these years Bungie finally made a Halo fan out of me. Time to kick back and fry some aliens. http : // www.nytimes.com Graphic PHOTOS: Halo: Reach, set as a prequel to the previous Halo games, will be released on Tuesday for the Xbox 360. (C1) Halo: Reach has futuristic weapons, slick visuals and realistic artificial intelligence. (PHOTOGRAPHS BY BUNGIE) (C7) Load-Date: September 13, 2010 End of Document Seeking True Marriage of Sex and the Xbox Factor The New York Times

Time: 13/06/2010  
MIND By Marvin Minsky. Illustrated. 339 pp. New York: Simon & Schuster. $19.95. ''HOW could solid-seeming brains support such ghostly things as thoughts?'' Marvin Minsky asks in ''The Society of Mind.'' It is not as though the brain were particularly solid. It is more like a blancmange, soggy and quivery - a frail vessel to contain the human mind. Yet the nerve cells of a brain outnumber the human population of the earth and they can communicate with one another in a thousandth of a second. Suppose we look at the brain as a collection of units or agents, ''each mindless by itself.'' If each agent is linked to 30 other agents, it can reach 1,000 agents in two steps and a million others in four steps. How does one try to mimic nature and build an intellect from such small components? How can an artificial intelligence perceive the outside world and react to it? Mr. Minsky explores means of explaining the world to a computer, translating it into language that you and I can understand, providing we accept some new concepts and terms. Marvin Minsky, a professor of mathematics at Massachusetts Institute of Technology with a background in psychology, evolved through cybernetics and earlier attempts to make ''thinking machines,'' and developed the M.I.T. Artificial Intelligence Laboratory. He turns out to be a poet and philosopher as well. The neurological sciences accept the brain as a found object and explore it from the outside in, finding how nerve cells connect and communicate to produce mind, the ultimate product of the brain. Computer experts start inside and work outward. What assemblies of units are needed to register awareness of external objects, their relation to one another and the story they tell? How can such perception lead to appropriate action? If you expect this book to guide you through each of these stages and end with a design for a humanoid robot or thinking machine, you will be disappointed. If you want to gain an insight into the designer's thought processes and be entertained along the way, you will be rewarded. ''The Society of Mind'' is an ingenious and stimulating book, repetitive at times to be sure, but leaping from thought to thought with admirable agility. Each thought or two is granted a section and each section occupies a page, so the book can be encompassed in stages, even by those with a short attention span. The style is crisp, the text packed with quips, aphorisms and homely illustrations. The author starts by taking the building blocks of human behavior and discussing their possible interrelationship, as though a child were playing with them. The poet walks hand in hand with the scientist: ''Smashing takes so little time that Wrecker, freed from Play's constraint . . .'' is worthy of Pope. After this introduction, a philosophical thread is woven with the materialistic. ''People ask if machines can have souls,'' Mr. Minsky writes. ''And I ask back whether souls can learn. It does not seem a fair exchange - if souls can live for endless time and yet not use that time to learn - to trade all change for changelessness.'' The human mind must have the ability to change, to allow the impact of memory and emotion on the straight chain of cause and effect. One's self is not just a single self but a number of selves, at times jostling for the acceptance of a particular belief or plan, or to make a choice between attractive alternatives. Beneath the obvious characteristics that make us instantly recognizable to our friends lie complex and possibly turbulent interactions. The prerequisite for the brain to function as mind is consciousness. The machine must be switched on before it can perceive the signs and signals that prompt thought or action. Relatively simple parts of the brain are responsible for our perception of the outside world by smell, sight, sound and touch. Other parts of the brain act as consultants to advise on the meaning of perceived objects and our reactions to them. Perception has no meaning for us unless it can be related to things perceived in the past and committed to memory. ''Each mind evolves its own internal universe,'' Mr. Minsky says. That universe is usually orderly, regulated and compartmented. But beware of a sudden breaking of the rules - a revelation that makes all things clear: ''One remembers that no questions went unanswered but forgets that none were asked!'' How do we start analyzing intelligence in Mr. Minsky's paradigm? Is it just the ability to solve hard problems? It is often easier for a machine than for the mind to solve hard problems, providing the problem is sufficiently specialized to be split into simple components. Only man or his close relatives can solve problems that involve using the same agencies for different purposes. For any machine to achieve an apparent goal, it must have an internal program or concept of the desired objective, then a means to assess the difference between observed reality and the desired goal, and finally it must take action to narrow the gap between the two. It is then acting as a ''difference engine.'' In Mr. Minsky's terms, the registration of memory can be simplified as knowledge lines (K-lines), each leading to parts of the brain that retain a certain memory, the agents of memory that comprise the mental state. The K-line attaches strongly to some agents, weakly to others in levels or bands of relative importance. When a new K-line is formed it tends to attach to other K-lines that are active at a certain level. If this is all getting too much for you, use a skip line (S-line) to skip over a few pages and get to the next bit. A mind is not just a memory bank, a data-acquiring machine. It must develop new ways to use the knowledge acquired. The judgment of children about simple comparisons such as ''more'' or ''less'' matures with age. The accumulation of new knowledge need not displace the old until that proves to have been superseded. The ability to learn is inherited, but Mr. Minsky says it is more economical for each individual to undergo the learning process than to be born with a genetic program to cover all eventualities. Each step in learning involves identifying in any perceived object what is essential for the functioning of that object - Mr. Minsky's homely example involves trying to discover what really makes a chair a chair. The learner selects the relevant data from an accumulated mass, thus forming a bridge between concepts, a ''uniframe.'' The act of perception is often influenced in other ways by our expectation of what we are going to see or sense. New ideas may have to break through the restriction imposed by our previous investment in ideas or skills. The investment principle also has a beneficial aspect - once a certain skill surpasses its competitors, it is more likely to be used in the future so that a phase of rapid progress may follow. The ultimate embodiment of this investment principle is the genetic code, which prescribes the detailed structure of every living thing; it is our ''general purpose'' machinery. Perhaps the most awkward component to fit into a mechanistic concept of mind is emotion. Mr. Minsky's solution is to regard emotion as a variety of thought. ''Machinelike'' implies an agency without emotions. Can a machine be intelligent without emotions? It is curious that we accept intellectual incompetence in our fellow humans as the genetic hand dealt them by fate but regard emotional incompetence as an illness to be remedied. Nevertheless we form both intellectual and emotional attachments. I found it disappointing that this intriguing topic was left at this stage and not pursued later in the book. Functioning of the brain depends on links between its various parts, and parallel connections are more dependable than connections in series. The mind, in Mr. Minsky's model, works by communication between the ''agencies'' or ''societies'' of the brain. Because many of these societies share the same function, the brain has the ability to retain considerable thinking power after damage to part of the structure. UNDERSTANDING the outside world requires processing of information - using the linkage between agencies registering such properties as size, shape, color, smell and taste. Some words act as ''polynemes,'' meaning that they trigger connections with many such agencies so that we can conjure up the smell and taste of an apple as well as its appearance. An object satisfying the majority of criteria established in memory agencies will be recognized as an apple, a chair or whatever. It is thus possible for the memory of a whole object to be retrieved by sensing only some of its properties, particularly when they are taken in context. It is not feasible to have a one-to-one connection between agencies of the brain, Mr. Minsky points out, so nature economizes by making one transmitting agent activate many agencies at once. It thus receives a pattern of input from the outside world as well as from other parts of the brain, a pattern that may be distinctive for the transfer of information or of ''frame-recognition'' (the appreciation of an object or scene as a whole). The perception of an object in three dimensions may depend on the visual images from different angles forming a family of different frames, called ''frame-arrays'' by Mr. Minsky. Words may evoke a frame array from past experience so that other words that fit the occasion are brought into awareness together. ''Recognition agents'' perceive the story conveyed by word sequences and anticipate possible consequences and reactions. ''Suppressor agents'' inhibit an undesirable reaction and ''censor agents'' act to deflect a line of thought. A joke is regarded as an incongruous thought that slips past the barriers of suppressors and censors. Parallel frame arrays could represent different interpretations of the same phrase or story in physical, social, poetic or other realms of thought and they could represent in the mind a model of things we know. We are confronted with one of nature's paradoxes - the physical world of the brain provides no room for freedom of will although this concept is an essential ingredient for our peace of mind. This is a disturbing book for a neurologist to read because the summation of mathematics + psychology + philosophy still does not approach the complexity of neurology. And yet the text pursues an exciting trail to an elusive goal. ''If we could deliberately seize control of our pleasure systems,'' Mr. Minsky says, ''we could reproduce the pleasure of success without the need for any actual accomplishment. And that would be the end of everything.'' This book has given me pleasure to read, and the accomplishment must give pleasure to the author for it is surely a success. You may or may not like Mr. Minsky's way of setting out to build a brain, but it will make you think. And that's what brains are for. Graphic Drawing End of Document Making Fast Food Even Faster The New York Times

Time: 26/12/2006  
Artificial Intelligence and Japan's Computer Challenge to the World. By Edward A. Feigenbaum and Pamela McCorduck. 275 pages. Illustrated with diagrams. Addison-Wesley. $15.75. THIS isn't just another of those books that says Japan is better than we are and therefore is going to keep on whipping us in productivity. ''The Fifth Generation'' goes considerably further than that. It points with a trembling finger at Japan's commitment to produce within a decade a new generation of computers so immensely powerful that they will in effect constitute a new and revolutionary form of wealth. KIPS, these computers will be called, an acronym of knowledge information processing systems. They will exploit the recent speculation that intelligence, be it real or artificial, doesn't depend so much on the power to reason as it does on a ''messy bunch of details, facts, rules of good guessing, rules of good judgment, and experiential knowledge,'' as the authors put it. They will be so much more powerful that where today's machines can handle 10,000 to 100,000 logical inferences per second, or LIPS, the next-generation computer will be capable of 100 million to 1,000 million LIPS. These computers, if the Japanese succeed, will be able to interact with people using natural language, speech and pictures. They'll transform talk into print and translate one language into another. Compared to today's machines, they'll be what automobiles are to bicycles. And because they'll raise knowledge to the status of what land, labor and capital once were, these machines will become ''an engine for the new wealth of nations.'' Will the Japanese really pull this off, despite their supposed tendency to be ''copycats'' instead of innovators? The authors insist that this and other stereotypes are largely mythical; that every great industrial nation must go through a phase of imitation. Sure, the Japanese can do it. And even if they fail to fulfill their grand design, they'll likely achieve enough to make it pointless for any other nation to compete with them. Meanwhile, the United States will assume the role of ''the first great post-industrial agrarian society.'' It's quite an awesome picture that Edward A. Feigenbaum and Pamela McCorduck have painted. What's more, they have impressive credentials - Mr. Feigenbaum as professor of computer science at Stanford University and a founder of TeKnowledge Inc., a pioneer knowledge engineering company; Mrs. McCorduck as a science-writer who teaches at Columbia and whose last book was a history of artificial intelligence called ''Machines Who Think.'' And their Jeremiad is extremely well written, even quite witty in places. It's certainly more articulate by an order of magnitude than ''In Search of Excellence,'' the book that defends America's managerial potential and now sits atop the nonfiction best-seller list. So what are we supposed to do in the face of this awesome challenge? The authors list various possibilities, such as joining up with Japan or preparing for our future as the world's truck garden. But what they'd really like to see is ''a national center for knowledge technology'' - that is, ''a gathering up of all knowledge,'' ''to be fused, amplified, and distributed, all at orders of magnitude, difference in cost, speed, volume, and usefulness over what we have now.'' Let that be as it may. While ''The Fifth Generation'' makes a powerful case, there are those who believe that, between the Pentagon's Defense Advanced Research Projects Agency (DARPA) and several interindustry groups that have been formed, we have already been sufficiently aroused to compete in this new race for world leadership. (The Soviet Union, by the way, is out in left field, according to the authors.) Whether the apocalypse it foresees is real or not, ''The Fifth Generation'' is worthwhile reading. Pamela McCorduck is very good on the debate over the ability of the machines to think, concluding that the condemnation they have met has been largely political - amusingly similar to ''the reasons given in the nineteenth century to explain why women could never be the intellectual equals of men.'' Mr. Feigenbaum is fascinating on his firsthand impressions of the Japanese computer establishment. (Each of the co-authors becomes a character in the narrative when his or her specialty happens to come up.) Together they are lucid on what the fifth-generation machines will be like. And there is the standard mind- bending section on future computer applications. I particularly like Mrs. McCorduck's vision of the geriatric robot. ''It isn't hanging about in the hopes of inheriting your money - nor of course will it slip you a little something to speed the inevitable. It isn't hanging about because it can't find work elsewhere. It's there because it's yours. It doesn't just bathe you and feed you and wheel you out into the sun when you crave fresh air and a change of scene, though of course it does all those things. The very best thing about the geriatric robot is that it listens . 'Tell me again,' it says, 'about how wonderful/dreadful your children are to you. Tell me again that fascinating tale of the coup of '63. Tell me again . . .' And it means it.'' Graphic photo of Pamela McCorduck; photo of Edward A. Feigenbaum End of Document No Headline In Original The New York Times

Time: 27/06/2014  
The United States-Germany soccer match on Thursday was a roller coaster of emotions. And an analysis of the social media communications before, during and after the match shows the minute-by-minute shifts in sentiment and in subjects discussed, as the American team lost to Germany but moved on in the World Cup competition. Luminoso, a text analysis and artificial intelligence start-up, which grew out of research done at the M.I.T. Media Lab, created a visualization of the social media communications on Twitter, Facebook and Google Plus, 900,000 in all. The graphic shows, first, the optimism before the match began, as reflected in the high volume of posts with the hashtag #IBelieveWeWillWin. Today's going to be a great day! #IBelieveThatWeWillWin #USA - Ki Hong Lee (@kihonglee) 26 Jun 14 Then, reality sets in, as a strong German team dominates in time of possession and is the aggressor. We see three elements: messages with negative and positive sentiment, and more negative than positive; and discussion of the American team's defense, which figures prominently since German has the ball most of the time. Two beleaguered American midfielders, Michael Bradley and Jermaine Jones, are the most criticized players. #USA being forced to play defensively all half made me forget Dempsey was even on - shutup keif (@tweetDboney) 26 Jun 14 Later in the match, discussion of the crucial game between Portugal and Ghana, being played at the same time in another stadium in Brazil, begins to bubble up. An assist from Portugal, which beat Ghana 1-0, ensured that the United States would move on in the World Cup. After the game, the online messages shift again to optimism - lots of #IBelieveWeWillWin posts - and to comments about the Ghana-Portugal match and its implications for the United States team. Just 30 more minutes and if these results hold (#GHA 1-1 #POR, #USA 0-1 #GER) the #USMNT goes through to round of 16. Tick. Tick. Tick ... - Joe Lago (@joelago) 26 Jun 14 Luminoso has been conducting this analysis and sorting throughout the World Cup, mainly to feed Sony's One Stadium Live website and mobile application. One feature of this match, not seen during earlier contests, was the social-media cross talk - the Portugal-Ghana discussion during the United States-Germany match. "This time, you see conversations interacting," said Catherine Havasi, co-founder and chief executive of Luminoso. "That is a different kind of dynamic than we had seen before." Luminoso's software goes beyond sentiment analysis, which correlates words and phases with positive or negative emotions. "That was great." "That was horrible." "Go team." Its technology also includes a knowledge base, which is built off a crowdsourced project at the Massachusetts Institute of Technology that began in 1999 and is called the Open Mind Common Sense Project. So its smart technology understands, in its way, concepts instead of just words. Examples of such concepts, said Ms. Havasi, a research scientist in artificial intelligence and computational linguistics, are: "The sun is hot." "Coffee comes in mugs." "People want to be respected." It uses those techniques to tease out soccer concepts that can be inferred, if not stated directly, like "US Defense" in the graphic above. "We do that in a fairly unstructured way, so it can be done as the data streams by, on the fly," Ms. Havasi said. Luminoso, founded in 2010, mostly works with consumer product companies and retailers, including Pepsi and Amazon. Load-Date: June 27, 2014 End of Document Big Investors Are Placing Bets on China’s Facial Recognition Start-Ups The New York Times

Time: 24/06/2012  
AN ANDROID The True Story of Philip K. Dick's Robotic Resurrection By David F. Dufty Illustrated. 272 pp. Henry Holt & Company. $26. ''How to Build an Android'' is the honest title of an earnest book, the first by David F. Dufty, a senior research officer at the Australian Bureau of Statistics. It explains how a team of researchers at the University of Memphis collaborated in 2005 with an artist and robotics expert, David Hanson, to create what was then the most sophisticated android anywhere, a replica of the science-fiction writer Philip K. Dick. They called him Phil. If you have heard of him, you probably know that he is missing, or at least his head is. It disappeared in December 2005, when Hanson was flying from Dallas to San Francisco to show Phil off to Google. Hanson changed planes in Las Vegas, but left Phil's head in a carry-on bag in the overhead bin. He didn't realize what he had done until he got to San Francisco. The bag continued on to Orange County, and has never been recovered. Where did Phil go? To many people the disappearance sounded like something out of Philip K. Dick, whose lurid, drug-enriched work inspired Hollywood's dark science-fiction thrillers ''Blade Runner,'' ''Total Recall'' and more. He wrote a lot about artificial intelligence, impenetrable conspiracies and androids going missing. And he had lived in Orange County until his death in 1982. Did Phil decide to go there on his own? Was he stolen, or did he escape? What had he been thinking? Dufty admits right away that nobody knows. He goes searching anyway, visiting the warehouse in Scottsboro, Ala., where the nation's unclaimed baggage goes to die. He wanders among the miles of abandoned toiletries, electronics, T shirts and toys: Nope, no Phil. This is the point where a storyteller might be lured toward the paranoid or paranormal. But all Dufty wants to do is tell what he says is the all-true back story: Who was Phil, and how did he come to be? Dufty was a postdoctoral fellow then at the Institute for Intelligent Systems at the University of Memphis, where he worked closely with the scientists building Phil. His reconstruction through interviews with the participants is an appealing depiction of brilliant minds dreaming big on shoestring budgets -- particularly Hanson, a skilled sculptor whose company, Hanson Robotics, had been pushing the frontiers of android making for years, and Andrew Olney, a programmer whose job was to give Phil the spark of artificial intelligence: the ability to recognize and convincingly respond to human speech. Phil had Dick's face, sculptured from photographs using a spongy, skinlike polymer called Frubber. With motors and cables as his facial muscles, his mouth moved when he talked. He made faces, and met a visitor's gaze. He had Dick's own clothing, provided by the author's family. The clothes hung on an inanimate mannequin; this android was advanced but not that advanced. The sum total of Phil's animate presence was in his head. For he had Dick's brain, or at least the closest that Olney and his collaborators could assemble using the best /early-21st-century technology -- software that combed through an immense database of Dick's own words as expressed during his lifetime in books and interviews, and shaped it into speech. It wasn't perfect -- even a writer as well known and talkative as Dick did not leave enough recorded traces of himself to allow an android imitator to even begin approaching the vast totality of a human mind. Phil could spit out an accurate Dick answer to a specific question if it found a match. If it didn't, Olney's solution was to program Phil to improvise, to spin related words into phrases in a way that (he hoped) sounded coherent. Phil was also given canned responses to predicted exchanges, like this: Q. What are you? A. I am Phil, a male Philip K. Dick android electronic brain, a robotic portrait of Philip K. Dick, a computer machine. The sum of these parts -- that was Phil. He was a dazzling blend of technology and art. He was also erratic, as you might expect any first-generation android to be. Unexpected questions and loud noises threw him off. Androids have a hard time responding to human speech cues, knowing when to answer and when to stop. Sometimes Phil would get into a self-/perpetuating conversational loop. His handlers -- who monitored his responses on a computer screen -- had to keep a close eye. Once someone asked Phil what he thought of ''Blade Runner.'' He started talking about commercializing literature and merchandising rights. Then he kept talking, and talking, as Hanson watched the dialogue monitor with alarm: ''There seemed to be a large amount of output waiting in the buffer, and it was growing larger every second.'' Phil wasn't going to shut up. Hanson cut off Phil's mike, so he seemed to stop, though his lips kept moving and the words kept (silently) flowing. Dufty provides an exhaustive understanding of how to build an android, but seems to have missed some of the /memos on how to build a book. His prose has the curiously flat quality of computer-/generated speech, and his flights of insight and imagery are too often earthbound. He has a lot of technical ground to cover, but his narrative tends to unfold with the dread linearity of PowerPoint slides. This technical-manual approach sometimes slows the drama, but Dufty finds it where he can. He is hip to campus office politics and the way egos rub together, and the suspenseful anxiety of grant applications. When a Chicago Tribune reporter writes about Phil's celebrated appearance at a technology expo and mentions Hanson Robotics but not the whole Memphis team, the hurt feelings are worth a couple of tense pages. But the character who ends up being most intriguing is poor nonhuman Phil, whose unknown destiny gives the book a tinge of sorrow. Tied as he is to the life and words of a deeply troubled and testy namesake, he can be churlish at times, giving snotty answers to simple questions. A Wall Street Journal writer said of Phil, ''The most advanced robot on exhibition was also, in my view, the most obnoxious.'' That's hardly surprising. But one mystery is why Phil's creators never gave him an answer to a question you would expect anyone to ask Philip K. Dick. It's the title of the story that inspired ''Blade Runner'': ''Do androids dream of electric sheep?'' As Dufty explains, no one ever thought of it. When the question inevitably arrived, Phil's unscripted reply began: ''Yeah, exactly. But I couldn't explain that feeling. I just couldn't give an explanation of it. But um, well, I remember one dream I had. In the dream Tess and I were in the kitchen on a high stool, we'd found a cereal box and on the back of the cereal box is extremely valuable information directed at us, and we were both reading it. And the relationship between that and 'Ubik' is an obvious one.'' Poor Phil. He was a little nutty, but he was A.I.'s pioneer. Hanson has since built a more advanced version, minus the programming. Huge corporations are using their computing power and money to make big gains in artificial intelligence. Apple has devised a ''personal assistant'' for the iPhone, Siri, that gives eerily conversational answers to plain-speech questions. She's very good, and supposedly will get better. But this is how Siri handles the question: Q. Do androids dream of electric sheep? A. I found three livestock services a little ways from you. I like to think Phil could do better, given another chance. http : // www.nytimes.com Graphic PHOTO (PHOTOGRAPH OF PHILIP K. DICK ANDROID BY ERIC MATTHEWS) Load-Date: June 24, 2012 End of Document What Apple Could Buy With Its $159 Billion The New York Times

Time: 18/11/2007  
71, a rumpled-looking man who wears shirts mended with masking tape, is Toshiba professor of media arts and sciences and professor of electrical engineering and computer sciences at the Massachusetts Institute of Technology, and one of the world's leading theorists of artificial intelligence. In the late 1950's, Dr. Minsky and John McCarthy, a professor of computer science at Stanford University, founded a research program that would evolve into the MIT Artificial Intelligence Laboratory. In addition to inventing and building thinking machines, Dr. Minsky wrote the classic "The Society of Mind," (Simon & Schuster, 1986) in which he tries to show how intelligence works "by the particular way the agents in the brain have evolved to interact." "The Turing Option," (Warner Books, 1992) a novel by Dr. Minsky and Harry Harrison, is about superintelligence in not-too-far-off 2023. Q. In the 1960's, science students, particularly those at M.I.T., talked of artificial intelligence, or A.I., as if it would create world revolution. Were they too optimistic? A. Well, it got stuck. A.I. was able to produce all kinds of wonderful things . . . programs that did better than the average stockbroker or portfolio manager, programs that could fix some piece of equipment. Around 1980, progress stopped in some ways and people went off in a number of other directions to try to find some way to get back. It stopped because we'd done the easy things. In the eye of eternity, it got stuck for a moment. A good example is, in 1964 or 1965, one of our students, Daniel Bobrow (now a vice president at the Xerox Corporation) wrote a program that could read a question from a high school algebra book, and sometimes, solve the problem. So it could figure out a little bit of language and algebra. It didn't get most of the problems because it couldn't understand the words. What people tried to do then is get a program that would read a story from a first- or second-grade children's book. But what happened was this: For any particular story, we could build into the program the knowledge necessary to read that story. We didn't have much trouble with the grammar. As soon as something was mentioned that the program didn't know about . . . (the system broke down). One M.I.T. student had a story where some person's daughter was kidnapped by the Mafia and they demanded a ransom. So he asked the program "What should we do?" The program couldn't understand. Finally, it asked, "Why would he pay MONEY to get his daughter back?" It could figure out a little bit of language, a little bit of algebra. It didn't get most of the problems because it couldn't understand the words. As far as I know, nobody has been able to get a machine to solve real problems that are informally expressed, the way somebody would normally express them. Q. How do you define common sense? A. Common sense is knowing maybe 30 or 50 million things about the world and having them represented so that when something happens, you can make analogies with others. If you have common sense, you don't classify the things literally; you store them by what they are useful for or what they remind us of. For instance, I can see that suitcase (over there in a corner) as something to stand on to change a light bulb as opposed to something to carry things in. Q. Could you get machines to the point where they can deal with the intangibles of humanness? A. It's very tangible, what I'm talking about. For example, you can push something with a stick, but you can't pull it. You can pull something with a string, but you can't push it. That's common sense. And no computer knows it. Right now, I'm writing a book, a sequel to "The Society of Mind," and I am looking at some of this. What is pain? What is common sense? What is falling in love? Q. What is love? A. Well, what are emotions? Emotions are big switches, and there are hundreds of these. . . . If you look at a book about the brain, the brain just looks like switches. . . . You can think of the brain as a big supermarket of goodies that you can use for different purposes. Falling in love is turning on some 20 or 30 or these and turning a lot of the others off. It's some particular arrangement. To understand it, one has to get some theory of what are the resources in the brain, what kind of arrangements are compatible and what happens when you turn several on and they get into conflict. Being angry is another collection of switches. In this book, I'm trying to give examples of how these things work. Q. In the 1968 Stanley Kubrick film "2001: A Space Odyssey," a computer named Hal developed a lethal jealousy of his space companion, a human astronaut. How far are we away from a jealous machine? A. We could be five minutes from it, but it would be so stupid that we couldn't tell. Though Hal is fiction, why shouldn't he be jealous? There's an argument between my friend John McCarthy and me because he thinks you could make smart machines that don't have any humanlike emotions. But I think you're going to have to go to great lengths to prevent them from having some acquisitiveness and the need to control things. Because to solve a problem, you have to have the resources and if there are limited resources . . . Q. Where were Stanley Kubrick and his co-author, Arthur C. Clarke, right with their "2001: Space Odyssey" predictions? A. On just about everything except for the date. It's quite a remarkable piece. Q. Do you believe the National Aeronautics and Space Administration wastes money by insisting on humans for space exploration? A. It's not that they waste money. It's that they waste ALL the money. Q. If you were heading NASA, how would you run it? A. I would have a space station, but it would be unmanned. And we would throw some robots up there that are not intelligent, but just controlled through teleoperators and you could sort of feel what's doing. Then, we could build telescopes and all sorts of things and perhaps explore the moon and Mars by remote control. Nobody's thought of much use for space. The clearest use is building enormous telescopes to see the rest of the universe. Q. Why are manned shots a NASA priority? A. Because NASA's people are basically oriented toward keeping themselves alive. They are a big organization. And the biggest part of it is Houston and that has to be fed, and what Houston is good at is putting men in space. The Jet Propulsion Lab is much smaller and has a smaller staff and is good at doing everything else. So, I think, in order to support that, they get into this vicious circle where you have to convince yourself that's what the public wants. Now, I think, the public is more excited by Sojourner than by astronauts. Q. When you go to the movies, what do you see? A. "Terminator," "Total Recall," which had ideas about implanted memory. Pretty clumsy, but I loved the engineering. I don't like movies exactly. One of my rules is not to think of the whole thing as having any unity. The idea of liking a whole movie is . . . People have this idea that they have to like something or not. Q. What do you read? A. Science fiction. Q. Do you read science fiction in the same way spies read spy novels -- for ideas? A. Yes. There are a dozen very, very rich sources of ideas out there. Gregory Benford of U.C. Irvine, David Brin, Larry Niven are the best writers of our period. When they write a book, there's some big new idea about something. I've also gotten a lot of good ideas from old-timers like Robert Heimlein and the late Isaac Asimov. Q. Where was Mary Shelley right and where was she wrong with her "Frankenstein" last century? A. She certainly was right in predicting how people would not understand the poor thing. That's SUCH a sad story! By the way, I've gone through that book very carefully to see if she left any hints explaining how the robot worked. But alas, no clues and the funny part is when you read it, you don't mind. Graphic Photo: Dr. Marvin Minsky, one of the leading theorists of artificial intelligence, at his home in Brookline, Mass. (Rick Friedman for The New York Times) Load-Date: July 28, 1998 End of Document This Artificial Intelligence Is Ruining My Commute The New York Times

Time: 31/03/2002  
Dr. Amy Rachel Greenwald and Dr. Justin Andrew Boyan, computer scientists, were married on Friday afternoon at the Brooklyn Botanic Garden. Dr. A. Stephen Boyan Jr., who is the bridegroom's father and a leader of the Baltimore Ethical Society, led a ceremony that incorporated elements of Judaism and humanistic philosophy. Dr. Greenwald, 32, is keeping her name. She is an assistant professor in the computer science department at Brown University in Providence, R.I., teaching artificial intelligence and Internet economics. She graduated summa cum laude from the University of Pennsylvania, where she received a bachelor's degree in computer science and one in economics. She also has two master's degrees, one in computation from Oxford and another in computer science from Cornell. She received her doctorate in computer science from New York University. The bride is a daughter of Dr. Elaine Greenwald and Dr. Robert Greenwald of Melville, N.Y. Her father is the chief of rheumatology at Long Island Jewish Medical Center in New Hyde Park, N.Y. Her mother, a clinical psychologist, has her practice in Melville, N.Y. Dr. Boyan, 31, is the associate chief scientist at ITA Software in Cambridge, Mass. He graduated from the University of Chicago and received a master's degree in computer speech and language processing from the University of Cambridge, which he attended as a Churchill scholar. He received his doctorate in computer science from Carnegie Mellon. The bridegroom's parents live in Marriottsville, Md. His mother, Kitty Boyan, who is retired, taught the fourth grade at Clarksville Elementary School in Clarksville, Md. His father is also an associate professor of political science at the University of Maryland, Baltimore County, in Catonsville. The couple met on an evening cruise in the Stockholm archipelago in August 1999, on the last day of a conference on artificial intelligence. "We discovered we had shared interests, not only in computer science, but also in tennis and backpacking," Dr. Greenwald said. "We are also both vegetarians." After the conference, Dr. Greenwald returned to New York, where she was living and working, and Dr. Boyan to San Francisco. A week later, Dr. Boyan sent her an e-mail message with a verse he'd written: A perfect summer fling, All tied up in a string. Or is it incomplete? In which case we should meet. Dr. Greenwald welcomed the overture, saying she had "felt a certain thrill and excitement on meeting someone I immediately connected to so well." Two weeks later, they went backpacking together in Yosemite National Park in California. "My friends thought I was crazy going into the woods for four days with a man I'd only met once," Dr. Greenwald remembered. "But I had also been speaking to him every night for two weeks for five or six hours." After returning from Yosemite to their homes, three more months of marathon telephone conversations ensued. After two quick weekend trips by Dr. Boyan to visit Dr. Greenwald in New York, they were ready to take the next step, and moved to Boston. "Leaving my job for a woman I'd known mostly on the telephone seemed crazy to my friends," Dr. Boyan said. "But I proved them wrong." http : // www.nytimes.com Graphic Photo (David Binder) Load-Date: March 31, 2002 End of Document Robotic Vehicles Contend for the Battlefield The New York Times

Time: 27/12/2004  
the time has come when families gather on Christmas Eve around a glowing computer monitor. Knowledge Adventure of La Crescenta, Calif., is ready for them. The company, known for its innovative software series including Knowledge Adventure, Sports Adventure, Space Adventure, Isaac Asimov's Science Adventure and Dinosaur Adventure, has put the Clement C. Moore classic, "A Visit from St. Nicholas," on a computer disk. The program looks like a children's storybook, spread open to show two pages, a bit of the verse and charming and colorful illustrations with a 19th-century look. If you have one of the many sound devices the software can be used with, you will hear an actor, Christopher Hewett, reading the poem. (The directions say a sound device is optional, but the built-in speaker in my PC produced only vague background rumbling and a few beeps.) You will also need a color VGA monitor, a hard disk with about two megabytes of free space and 500 kilobytes of memory. A mouse does not have to be stirring; you can turn the pages from the keyboard. "The Night Before Christmas" is $14.95. As a holiday promotion, it is free with the purchase of one of the Adventure series programs. 'Genetic Playground' There are plenty of exotic animals in Simlife, a simulation from Maxis of Orinda, Calif. But existing or extinct animals are not the point of Simlife. Described as a "genetic playground," the program invites you to create your own ecosystem, populate it with plants or animals, which may be of your own design, and see how the whole thing works, or fails to work. Learning to play Simlife is not a trivial task. There are so many variables, tools and combinations that sometimes it seems like real science, or real divinity. I tried the on-screen tutorial, but it froze at an early stage. There is a printed tutorial in the manual, and a message in the package inviting users to report any bugs they encounter. Previously available for the Macintosh, Simlife is now available for computers running MS-DOS 3.0 or later. A lot of computer is required: a 386 or better processor; at least two megabytes of RAM, with four or more highly desirable; a hard disk with at least two and a half megabytes free; a mouse; VGA, and a Soundblaster, Adlib or Roland sound card or one compatible with them. Again, though this program theoretically works with the speaker built into the PC, you would not like it. As a READ.ME file on the installation disk says: "Note that in the interests of your sanity, Simlife will install with all sounds turned off if you are installing for the PC Speaker." If you become an addict, you will soon want more memory and hard-disk space. Simlife for DOS computers has a suggested retail price of $69.95. Real Wisdom One of the most important books in computer science is not a computer science book at all. It is a work of philosophy, "What Computers Can't Do," by Hubert L. Dreyfus. First published in 1972, when Artificial Intelligence seemed within grasp, the book marshaled densely reasoned arguments that digital computers could never be made to think. Artificial Intelligence, the author argued, was based on "the Cartesian idea that all understanding consists in forming and using appropriate symbolic representations," ignoring or minimizing the role that common sense, or know-how, plays in human intelligence. That know-how, he says, is not a matter of following unconscious rules, but is a consequence of having a body and of living in a real physical world. Under the title "What Computers Still Can't Do," the book has been reissued as a $13.95 paperback by M.I.T. Press. It remains compelling, if not light, reading. Unless you are well acquainted with an earlier version, it is best read chronologically, starting with the original work, then the introduction to the 1979 edition and finally the introduction to this edition. Load-Date: December 22, 1992 End of Document Leo Villareal The New York Times

Time: 03/05/2001  
months Electronic Arts has been trumpeting its coming subscription game Majestic (www.majestic.ea.com), which will be played in real time and will use e-mail, phone calls and Web sites to create a completely immersive experience. While Majestic has not been released yet, someone else has created a game along the same lines. But this game is free and is only now becoming well known. The game begins with an online trailer (countingdown.com /features/?feature\_id=16381) for "A.I.," a Steven Spielberg film about artificial intelligence that will be released on June 29. Watch the trailer carefully. Watch it again. One more time. See anything? Look harder. I'll give you a hint. Look at the credits, especially the unusual "sentient machine therapist" credit given to Jeanine Salla. Using an Internet search engine, you can locate a site where you'll learn that Dr. Salla is a professor in the artificial intelligence department of a university founded in 2028. She specializes in robot intelligence. Jeanine Salla is one entry point into the most remarkable movie-promotion gimmick ever created for the Web. It is a nameless puzzle-and-adventure game, with (so far) nameless designers, presented through a vast collection of sites portraying an entire universe of the future. Dr. Salla's world is notable not only for its elaborate vision and core murder mystery but also for its subtlety. There is no invitation on the Warner Brothers "A.I." Web site to play (aimovie.warnerbros.com), but you can see another trailer. You either have to find the game through the clues in the two "A.I." trailers (the clue in the trailer on the "A.I." Web site is so obscure that it is hard to understand how it would ever be recognized) or hear about it by word of mouth. Since the game was discovered three weeks ago, word is spreading. While a few people have posted their discovery of the trailer clue on the message forum at the "A.I." site, most have heard about Dr. Salla through an article in Ain't It Cool (www.aintitcool.com/display.cgi ?id=8659), an independent Web site with entertainment news. After visiting the Web site of Dr. Salla's university, you will find other connected Web sites, all painting a disturbing picture of the future. A robot emancipation site bitterly denounces the Supreme Court's recent Dred Scot II decision, which asserts that intelligent robots are only property. The Anti-Robot Militia, on the other hand, calls for solidarity against the robot hordes. "It's not the color of your skin that's important," a poster proclaims, "it's the flesh inside." On these Web sites there are e-mail addresses and telephone numbers that you can use to gain further information. Early in the game, it was possible for people to leave their home phone numbers with the Anti-Robot Militia. After a few people got threatening phone calls from a pro-robot hacker, the militia changed its Web site, saying it could no longer take phone numbers because its security had been compromised. The puzzles in the game are remarkably difficult -- for me, many of them seem unsolvable. For one puzzle you need some knowledge of chemical elements, and for another you need to recognize that "Knock! Knock! Knock! Who's there?" is an obscure line from a famous play. Some clues are hidden within the comments of the HTML code of Web pages, while others can be discovered only by manipulating images with graphics software. There are very few people who have the necessary knowledge and know-how to solve all these puzzles, but a thousand people working together will do better. Ad-hoc groups have formed on the Internet to pool information and ideas. The largest, Cloudmakers (groups.yahoo.com /group/cloudmakers), has more than a thousand members. Together these people can solve the most obscure and intricate puzzles. They are also not above cheating, going so far as to write a program that hacked through a particularly difficult puzzle, then trying to use that information to figure out how it could have been solved. They have even used advanced Internet tools to discover the names of the registered owners of those sites. Two weeks ago, a mysterious figure who took the name Father sent e-mail to Ain't It Cool and Cloudmakers to say the Puppetmasters, Father's designation for the game's mysterious creators, didn't approve of the way that Cloudmakers and Ain't It Cool were playing the game because they were "circumventing traditional methods." A debate on whether the e-mail was a hoax was inconclusive. There is proof that the Puppetmasters, sometimes called the Muppetmasters at the Cloudmakers site, appreciate the vast conspiracy to solve their game. Recently a new page showed up on one of the game sites presumably run by the Puppetmasters that referred viewers to the Cloudmakers. It is probable that the Muppetmasters have become members of the group and are supplying answers and red herrings as they see fit. What is remarkable is the extraordinary amount of thought and effort apparent in this unpublicized game. There are almost two dozen game sites active now, and more will be introduced. The sites are wildly different in design, from slick corporate sites to chatty home pages. There are two university sites, a coroner's site, a hat store and several sites of architects who build intelligent houses. One of the architect's sites is written entirely in German. These sites all look completely real, yet they have been created out of whole cloth entirely for this game. It is likely that the game's designers plan to keep things going until the film comes out this summer. More puzzles will appear and more Web sites will show up until the mystery can finally be solved and there will be nothing left but to see the movie. The "A.I." game would be fascinating even if the movie didn't exist. One only wonders how the film will ever be as good as its marketing gimmick. New Twist on Old Game IT may be hard to remember the days when children didn't sit on airplanes feverishly pushing buttons on pocket-size game consoles. But I was a child in those days, and one of my favorite games had me carefully tilting a plastic case as I tried to roll little metal balls into indentations in the bottom. Now Nintendo has used advanced motion-sensor technology to let you roll a little ball around the screen by tilting your Game Boy Color, and while it may be nothing but a souped-up version of that old low-tech game, it is also technology at its coolest. In the game, called Kirby Tilt 'n' Tumble, Kirby is a little pink, round creature who will roll downhill when you tilt your Game Boy. If he needs to board a passing cloud, just give the Game Boy a sharp jerk and up he jumps. Even though Kirby is nothing but a collection of animated pink pixels, he moves as if he is affected by gravity. For anyone familiar with the way game consoles work, that is remarkable, although for my wife, who had never used a Game Boy, the fact that Kirby rolls around the screen wasn't at all surprising. For her, all technology is inherently mysterious and magical, and with no real concept of its limits she probably wouldn't be surprised if computers were controlled by thoughts or you could send a fax through your DVD player. The technology behind Kirby is so remarkable that even a badly designed game could keep a player engrossed for hours, but Kirby is wonderfully designed, and the action is among the best I've seen in any Game Boy game. As Kirby wends his way along treacherous paths, hops from cloud to cloud, negotiates crumbling walkways and battles spinning eyeballs, he shows us the whole range of tilting possibilities. Kirby also introduces difficulties never before seen in a game. Because the screen is dim, it's often necessary to angle the Game Boy to face a light source, but that can roll Kirby right off a precipice. And children who play Kirby in the back seat of the car will learn to loathe potholes and quick turns, which can make Kirby spin out of control. If you start seeing young children attending town hall meetings to demand loudly that something be done about the deplorable state of city streets, blame Kirby. Kirby Tilt 'n' Tumble; published and developed by Nintendo for the Game Boy Color; $34.95; for all ages. http : // www.nytimes.com Graphic Photos: A puzzle game, top, promotes "A.I.," a movie on artificial intelligence. Game Boy, above, has a high-tech version of an old game. Load-Date: May 3, 2001 End of Document An Effort to Help Free-Software Developers Avoid Suits The New York Times

Time: 18/02/2008  
"Some books are to be tasted, others to be swallowed, and some few to be chewed and digested." Francis Bacon, "Of Studies" MY very brief plunge into the electronic literary market consists of tasting Michael Crichton's "Timeline," by courtesy of a hand-held computer. Even had I been reading Bacon or Shakespeare, the experience would have been dismal. Since I am not one of Mr. Crichton's ocean of fans, the event has been profoundly depressing. This scarcely would matter, except that electronic books (to call them that) may become as prevalent as surfing the Web. Some publishing experts are predicting a mass market for e-books in two to three years. For me the Internet, as I have remarked elsewhere, is like the Congo. I know it exists, but I will never go there. Never having learned to type, I am writing this lament with a Pentel Rolling Writer black ballpoint pen upon a yellow legal pad, employing the clipboard I inherited from a Cornell roommate in 1947. This is mentioned to acknowledge that I am a dinosaur, Bloom Brontosaurus Bardolator, perhaps better suited to be a creature in a Crichton thriller than a reader of one, whether on a screen or in hard copy. Publishers who are rushing toward the electronic marketplace say they are anxious about losing their readership age 45 or younger. These readers, they believe, will peruse screens, but will not willingly turn the pages of a book. Perhaps these publishers will prove to be right, and we will begin to divide into two audiences. When those in later middle life and in old age gradually yield to mortality, in a quarter of a century or so, all newly printed books will be limited editions, and e-books will have replaced the bound volume, as surely as books once replaced scrolls. A foretaste of this possible future was available last week when Microsoft offered free downloads of "Timeline" to anyone with a Pocket PC, a palm-size device about the size and heft of a mass-market paperback. I acquired a loaner machine from Hewlett-Packard, which came equipped with Microsoft's Reader software, which is needed to scroll through a text that runs, in the old-fangled version published by Knopf, 450 pages. Over the Memorial Day weekend I settled into the reclining chair in my living room where I usually read. Being a Falstaffian fellow, I rested the computer where I normally rest books: on my belly. Though the Pocket PC type is clear and legible, each screen holds less than the equivalent of a page -- sometimes there are only five or six words to a line -- and you must keep pages scrolling by pressing a button. Ordinarily when we're sunk in a book we're scarcely conscious of turning the pages, but with Mr. Crichton, suffice it to say, I was all too aware of the button. The plot, borrowed from "A Connecticut Yankee in King Arthur's Court," is about a billionaire clearly modeled on Bill Gates, who hires a band of adventurers to visit medieval France in a time machine. Mr. Crichton's prose is as dead as the 14th century, and if you're reading it on a hand-held computer, it is a double ordeal, physical and stylistic. Watching a screen is not reading, or rather is not how to read, if "reading" means something more or other than accompanying Mr. Crichton into the theme park of his version of historic France. I am aware that the screens of personal computers and of e-book readers, not to mention larger screens to come, are not or will not be as irritating as that of a Pocket PC, but size is hardly the crucial factor here. Reading an authentic book is very different from watching a movie, television program or computer screen. "Authentic" is necessarily the key word in that assertion, and needs a little elucidation. Reading a short story by Chekhov, a poem by Hart Crane, a novel by Jane Austen or a play by Shakespeare is an activity only minimally visual. The tyranny of the bodily eye is usurped by the inner ear, which is a metaphor for the mind exercising all its powers. I am not a Luddite, and am aware that there may prove to be -- even in my own remaining lifetime -- no clear limits to artificial intelligence. Computers may yet read, write, think, speak in ways transcending their programming. The epics and romances of artificial intelligence may inundate us and be no better or worse than the breaking wave of publish-your-own-manuscript e-books. But a screen remains a screen, and a printed book is something other than a container, if its content is Jane Austen or Shakespeare. Mr. Crichton does not contain the reader. Shakespeare paradoxically does. If what we read is "Pride and Prejudice" or "Hamlet," we need to hold it rather more individually than a screen, by its very nature, can permit. I am not, in this, stressing the book as an aesthetic object, but rather as simply an isolated entity, a reminder that "Pride and Prejudice" or "Hamlet" is an achieved otherness, an idiosyncratic adventure of the spirit. Information doubtless is as well or better transmitted upon a screen as in a book, but wisdom and beauty cry out for a more individual representation. No one will say that a computer screen is the precious lifeblood of a master spirit, or that if you sliced into a screen -- as Montaigne said of a book's pages -- it would bleed. Milton and Montaigne became identical with the books they had composed. Will Mr. Crichton or Stephen King become identical with a screen? I HAVE declared my own condition as a fossil, and I am a little haunted by the fear that books could yet also become fossils, if all the world's publishers were to go completely mad. (Last week the chairman of one house said e-books would "nudge Mr. Gutenberg off center stage." The journalists at his news conference reported that he spoke in jest -- though maybe not.) And yet, solitary readers continue to be born and to develop, since the quest for wisdom, and for aesthetic dignity and difficult pleasure, will continue. Solitary readers who love Austen and Shakespeare will want and need to reach out and hold books in their hands, even at moments when the books are not immediately to be opened for rereading. There are books on my shelves that I've held, and read, almost to pieces. One gets fond of the dog-eared quality, even the crooked bindings. There is comfort in them. Intimacy with a book is an experience not easy to describe, even when the writer attempting the description is William Hazlitt or Virginia Woolf. Intimacy with a screen is, I suppose, possible, but if there are descriptions of it available, I would rather not see them. There is an aura to books that is irreplaceable. The best analogue would be the aura of dead or lost friends and lovers, never quite replaceable. http : // www.nytimes.com Graphic Photo: Reading Michael Crichton novel on a small screen is found to have two strikes against it. Load-Date: June 4, 2000 End of Document THE YEAR IN IDEAS: A TO Z.; The Game That Plays You The New York Times

Time: 26/05/2005  
rises like a glistening flute of Champagne from the beer-bottle skyline, as if in toast to a New Year's mix of emotions: hope and loss; love found and love betrayed; what can be and what almost was. And when you see it, you know instantly, absolutely, where the movie wants you to be. Ah, the Chrysler Building: Manhattan. Not even the Empire State Building is as immediately identifiable, or can say so much so quickly. Shimmering in the morning sun or under spotlight beams at midnight, the Chrysler Building can evoke everything from East Side sophistication to Big City hollowness. In ''Someone to Watch Over Me,'' Ridley Scott's 1987 thriller, a police detective and family man from Queens obsesses over a beautiful Manhattan socialite. And what dominates the western horizon from his working-class home in Queens, almost in taunt, is the Chrysler Building, seductive, unreal. In truth, the building has rarely glittered as brightly on film as it does in real life. Beyond anchoring the establishing shot of many movies set in New York over the last several decades, it is almost never the star. More often it has served as the dependable character actor who gamely supports the marquee attraction, a Van Johnson to Gene Kelly. This second-billing relegation began when the Chrysler Building was but an ingenue. Movie lore has it that in the 1933 picture that bears his name, King Kong was originally going to swat airplanes from the building's silvery spire. But the Empire State Building, finished in 1931, soon stole the thunder, and the gig, when it eclipsed the Chrysler Building's blink-of-an-eye reign as the world's tallest. In clips and stills from that movie, there in the background sulks a dwarfed Chrysler Building. James Sanders, the author of ''Celluloid Skyline: New York and the Movies'' (Knopf, 2001), jokes that any essay regarding the Chrysler Building in movies should be titled, ''And the Award for Best Supporting Skyscraper Goes to '' ''It was always appearing in establishing shots, and never quite getting the center of attention that maybe it should have had,'' he said. ''There was always the Empire State Building there to upstage it.'' The Chrysler Building figured in a few movies in the 40's, 50's and 60's, including ''Young Man With a Horn,'' a 1950 drama that starred Kirk Douglas as a gifted jazz trumpeter reaching for a high note the way the skyscraper reaches for the clouds. Better remembered, though, is ''An Affair to Remember,'' in which two lovers, played by Cary Grant and Deborah Kerr, agree to test the endurance of their love by meeting six months hence -- at the top of the Empire State Building, of course. Perhaps, as Mr. Sanders suggests, the Chrysler Building's distinctive look made it too much of a scene-stealing risk. Or maybe the fact that it was not illuminated at night for many years tempered its romantic allure. Whatever the reason, movies almost never exploited its symbolic potential -- until, perhaps, the release in 1978 of ''The Wiz,'' an all-black, all-New York version of ''The Wizard of Oz.'' The director, Sidney Lumet, used not one but five Chrysler Building crowns to evoke the Emerald City at the end of the yellow-brick road. The Manhattan skyline would not have worked, nor would five Empire State Buildings. But five Chrysler Buildings? Perfect. Then, in 1982, Larry Cohen directed ''Q: The Winged Serpent,'' in which a flying monster nests at the peak of the Chrysler Building. A cult favorite for some and a waste of time for others, the movie nevertheless tapped into the building's darker mood, reflected best by the gargoyles that coil in sentry at the base of the crown. The Empire State Building has its giant ape; now, at least, the Chrysler Building has its giant serpent. Mr. Cohen once said as much in an interview with the online magazine Cinema Gotham: ''I've always thought the Chrysler Building was the most interesting building in the city and that it deserved to have its own monster.'' In the years immediately before 9/11, when real horror overtook the fantastic, the Chrysler Building became a frequent cinematic casualty. In 1998 alone, the asteroids of ''Armageddon'' lopped off the top of the building, the tidal waves of ''Deep Impact'' lapped against its telltale spire and an errant missile intended for the scaly star of ''Godzilla'' hit the Art Deco landmark instead. Oops. If these movies intended the Chrysler Building to serve as a sleek symbol of humankind's hubris -- fitting, given the folly of its developer's quest to build the world's tallest building -- they were outdone by Steven Spielberg in 2001. Toward the end of his futuristic film ''A.I.: Artificial Intelligence,'' aliens guide their craft through the underwater ruins of Manhattan, hooking a right at the Chrysler Building, stilled, beautiful and heartbreaking. More and more, it seems, the building is finally emerging from the stage shadows of others. Matthew Barney's myth-laden, often alluring art film ''Cremaster 3'' reimagines the construction of the Chrysler Building as the building of a glittery false idol. In ''Spider-Man,'' the hero, played by Tobey Maguire, mourns a beloved relative's murder by perching on one of the Chrysler Building's silvery gargoyles and staring into the starry urban abyss. And in a forgettable 2002 comedy called ''Two Weeks Notice,'' the building shares a long scene with Sandra Bullock and Hugh Grant, who discuss their love for the landmark while flying past it in a helicopter. But their witless banter turns to white noise as their silent co-star steals the film with the easy guile of a Barrymore. http : // www.nytimes.com Graphic Photos: AT HOLLYWOOD AND LEXINGTON -- From left: underwater in ''A.I.: Artificial Intelligence'' (2001) behind that other skyscraper in ''King Kong'' (1933) ''Armageddon'' (1998). ''The Wiz'' (1978), left, used five Chrysler Buildings in its Emerald City. (Photographs by Photofest top left, DreamWorks) Load-Date: May 26, 2005 End of Document Even on a Retro Highway, It's Best to Watch the Road Ahead The New York Times

Time: 29/07/2001  
can sometimes be a provocative critic. A few weeks ago, two strangely similar movies opened within a couple days of each other: John Singleton's urban drama "Baby Boy," on June 27, and Steven Spielberg's science-fiction fairy tale "A.I Artificial Intelligence," on June 29. At first glance, the two films couldn't seem farther apart on the cultural spectrum. Mr. Singleton's work is a didactic fable with a precisely honed sociological thesis that African-American men are systematically prevented from assuming adult responsibilities by their mothers, who insist on smothering them with affection. Mr. Spielberg's film is an unbridled fantasy, in which the director seems determined to unleash all the personal demons he has kept under control during his long reign as Hollywood's most consistently commercial filmmaker. Along with "Always," Mr. Spielberg's oddball 1989 supernatural romance, "A.I." is one of the few times the director seems to have let down his guard long enough to allow a good-size chunk of unfiltered personal feeling to enter his material -- a chunk that promptly jams the gears of Mr. Spielberg's famously efficient storytelling machinery. The movie sputters along, from one largely incoherent notion to the next, leaving only one clear line of development -- the desperate need of the robot boy David (Haley Joel Osment) to experience a mother's love. Neither "Baby Boy" nor "A.I." is doing record-breaking business, as is usually the case with movies that pose more questions than they answer. But with their maternal obsessions, both films are clearly on to something. At a moment when American movies seem to be suffering from arrested intellectual and emotional development -- somewhere around the mental age of 12, to judge from this summer's crop of cloddish action films -- these movies seem to be longing for a lost maturity, a way out of the impasse of enforced infantilism. Appearances to the contrary, these films are not standard Oedipal dramas. They are, if anything, anti-Oedipal in their insistence that all is the fault of the mother -- that children are oppressed either by too much love (Mr. Singleton's thesis) or too little (Mr. Spielberg's). (In both films, fathers are absent or ineffectual, suggesting that the classical Oedipal conflict has long been resolved to the child's advantage.) The hero of "Baby Boy," is Jody (Tyrese Gibson), a 20-year-old in South-Central Los Angeles who is the father of a son and a daughter by two different women. But he has yet to move out of his mother's house even though she -- played by A. J. Johnson as young, attractive and quite sexually active herself -- is practically pushing him out the door. Mr. Singleton suggests that Jody is somehow unhealthily hooked on the warmth and succor his mother gives him, a succor that is seen as a sort of debilitating, addictive drug. In "A.I.," little David has precisely the opposite problem. A robot programmed to love, he is not loved in return by his cold, adoptive human mother (Frances O'Connor). In one of the most traumatic scenes in a children's film since the death of Bambi's mother, David's mother packs him up and abandons him in a haunted wood as gnarly as anything conceived by the Brothers Grimm. This is rejection on the grandest scale -- a rejection that Mr. Spielberg goes so far as to liken to the Holocaust. The subsequent scenes set at the robot-annihilating Flesh Fair evoke "Schindler's List" with their disturbing imagery of emaciated prisoners being led to destruction. Never one to be hobbled by foolish consistency, Mr. Spielberg quickly swaps his Jewish metaphor for a Catholic one: David will spend the rest of the film searching for the "Blue Fairy," a figure ostensibly out of Carlo Collodi's 1883 novel "The Adventures of Pinocchio" but more clearly inspired by the traditional blue-robed representation of Mary. Motherhood has long been Mr. Spielberg's religion: his first theatrical feature, "The Sugarland Express" (1974), was about a heroic mom who snatches her child back from a foster parent. But now his god(dess) is a cruel and distant one who answers prayers only after a millennium or two has passed and then in a compromised, unsatisfying way. The defining image of "A.I." -- David trapped under a toppled Ferris wheel in the underwater ruins of Coney Island, praying for eternity to a plaster saint -- eerily echoes the opening shot of "Baby Boy," in which Mr. Singleton depicts the adult Jody as a fetus curled up in the amniotic fluid of his mother's womb. Both are haunting images of stagnation and frustration, of paralysis just on the brink of life and being. These are films about children who want to be adults but can't. The protagonists of both "Baby Boy" and "A.I." live in a state of suspended development -- literally, in the case of David, who may be programmed to love but never to develop physically; metaphorically, in the case of Jody, whose physical and sexual development has outstripped his limited capacities for commitment and responsibility. Who's fault is this? Mr. Spielberg comes close to implicating himself, and the American popular culture he has helped to define. David would seem to embody the dream that the protagonists of Spielberg films like "Hook" and "Close Encounters of the Third Kind" desire so desperately -- to remain a child forever, evading the adult duties of home and family. But the dream turns out to be a nightmare, an eternal prostration before an unresponsive, artificial image. American movies and music have taken over the world by promising, among other things, eternal youth and protection from real world complications. For Mr. Spielberg and Mr. Singleton, eternal youth is starting to look like eternal stagnation. http : // www.nytimes.com Graphic Photo: Haley Joel Osment and Frances O'Connor in Steven Spielberg's "A.I. Artificial Intelligence." (Warner Brothers and DreamWorks Pictures) Load-Date: July 29, 2001 End of Document Political Pundit Whose Passion Is for the Fate of Kings The New York Times

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a professor of psychology at Princeton University, taught himself to juggle a few years ago and somehow it's been bothering him ever since. ''Now I can juggle,'' he says, demonstrating with empty hands. ''I know I have learned something, but I don't know what I have learned.'' Dr. Miller learned juggling from a book. There is nothing in the book but words and pictures. But, Dr. Miller observes, his large hands still moving, juggling is neither. ''I can propositionalize about juggling, but what I've learned is not propositional and not in pictures.'' So how did the knowledge of juggling get out of the book and into Dr. Miller's mind? In what form is it stored there? And how does it get out again? Dr. Miller notes that most of what the mind does best it does unconsciously, whether the behavioral product is talking, walking or juggling. An act may be consciously initiated, of course, but then the mind goes to work away from consciousness, retrieving the necessary information to put together the complicated behavior - and nobody has ever seen what the mind is actually doing then. GEORGE A. MILLER, a professor of psychology at Princeton University, taught himself to juggle a few years ago and somehow it's been bothering him ever since. Nevertheless, the mind's work is what the relatively new field of cognitive psychology is about. It is a field Dr. Miller and his colleagues and graduate students are still inventing. The 62-year-old Dr. Miller is the kind of man one turns to not only to gain a glimpse into cognitive psychology, but in a sense all of science. He has thought and written articulately about how science is done, how discoveries are made, and he doesn't shy away from describing the puzzles that attract him, even when he has no solutions. In the 1960's, Dr. Miller and Jerome Bruner founded a ''center for cognitive studies'' at Harvard, with the purpose of scientifically investigating the works and states of the human mind. In all likelihood, they could not have done it earlier. Behaviorism, the doctrine that mental states cannot be directly observed and therefore a scientific psychology can study only behavior, had to prepare the ground. ''Psychology has been like a dog turning around three times before it lies down,'' Dr. Miller said. First there was the study of mental states through introspection, then the study of behavior without reference to mental states and now the study of mental states through inference from behavior. ''Expectation,'' for example, was once a forbidden, even a laughable, concept in experimental psychology. Although it was an expression used every day outside the laboratory, it wasn't observable inside the lab and therefore wasn't permissible or useful, the psychologists asserted. But Dr. Miller insists, ''I think we have clearly shown that what a person expects controls what he will perceive. For example, suppose you know you are going to hear a word.'' With the precision of statistics, Dr. Miller and other cognitive psychologists can demonstrate that if you expect a word to be one of two alternatives - ''boy'' or ''tree,'' for example - you can successfully determine which word is being used even when it is said at an experimentally chosen very quiet level and in a noisy environment. But if you are waiting for any English monosyllable, the probability of getting it right is one in 20 at that same level. Therefore, in Dr. Miller's view, expectation demonstrably exists; it has effects and is known by them - even though it is a subjective mental state. For a while Dr. Miller thought, like many other psychologists, that computers - artificial intelligence machines - would produce a model of problem-solving by minds. ''That became a weak theory,'' he now says, especially as computers of higher and higher speed and capacity solve problems in ways less and less suggestive of human intelligence - as brute-force computer chess programs, for example, overpower programs designed to approach the game as a human would. ''How computers work seems to have no real relevance to how the mind works, any more than a wheel shows how people walk,'' he says. ''I think artificial intelligence will develop along its own lines and leave psychology alone entirely.'' Dictionaries and Minds This year, Dr. Miller is thinking about dictionaries. Like computers, they were made by humans to store information. Though they store information very well, they are obviously - far more clearly so than computers - different from minds. That difference troubles no one until the question arises: How, by creating something more nearly conformable to human minds, could you make a tool that did the work of a dictionary, only better? As archives of usage, Dr. Miller believes, dictionaries are wonderful. But they are also used for vocabulary teaching tools. Here, problems arise. He cites an example: A teacher asked students to look up the word ''chaste'' and to use it in a sentence. Among the resulting sentences: ''Even after much use, the plates were still chaste.'' ''The amoeba is a chaste animal.'' ''The milk was chaste.'' After such an experience, Dr. Miller says, ''You ought to say the dictionary is wrong, let's revise our theory of the dictionary. But teachers say the kid was wrong, and the ordinary sense of chaste is not being communicated to those children.'' Part of the trouble, Dr. Miller believes, lies in the way dictionaries are made. Lexicographers are in the business of making finer and finer distinctions, distinctions ordinary people don't always make. Such distinctions are part of the archival function, but the job of communicating those distinctions to dictionary users, Dr. Miller believes, could stand improvement. To test a dictionary's conveyance of even obvious distinctions, one of Dr. Miller's graduate students devised an experiment. Quoting definitions and example sentences from a child's dictionary, she contrived test items containing two senses of the word defined, preceded by only one example sentence. Like this: Example: He threw a line to the swimmer. A.A piece of rope. B.A segment of poetry. Q. Was it A or B that was thrown to the swimmer? The test was given to Princeton undergraduates and bright fifth graders. Mere chance - flipping a coin, say -would have given 50 percent A, the correct answer. Of the fifth graders, 65 percent chose A. The Princeton students did better - 85 percent. A Flaw Is Seen Are Princeton students so dumb that only 85 percent of them can tell rope from poetry? Preposterous. There must be a flaw in the dictionary, Dr. Miller reasons; if the example sentence does not pick out unambiguously the sense of the word in question, something ought to be done about it. How? There are things to try, at least. ''What I'd want to do, if it @weren't so ambitious,'' Dr. Miller says, ''is write definitions that would reduce the number of alternative senses. But by what criterion? What is a good psychological criterion for when two senses are different?'' ''A definition is good if it evokes the same concept as the word itself,'' Dr. Miller proposes. Then he tries another: ''When told a definition of a new word, a person can add that word to his vocabulary and make all the right connections to words he already knows. If you look up 'collie,' it's a kind of dog; if you look up 'dog,' it doesn't tell you what the kinds of dogs are. In an ideal lexicon you would always see the connections between collie and dog in both directions.'' ''In listening or talking, the words you want come very fast,'' Dr. Miller points out. ''Ordinarily, in any filing system, the bigger the file, the longer the retrieval time. But it is not the case that the more words you know, the longer it takes to think of the word you want. That makes you wonder whether a dictionary is a reasonable model for word knowledge in the head. For one thing, word knowledge in the head is not alphabetized. To think of a word, I don't start with aardvark and run through to xylophone or zymurgy. The knowledge is thematically organized somehow.'' Thematically organized wordbooks - thesauruses - already exist, but they are not very easy to use; connecting ''collie'' with ''dog'' forward and backwards, and everything to everything else, would produce an impossible and unconsultable volume that could be read only with the help of a powerful computer. Dr. Miller has thought of a computerized thesaurus, but the idea has little appeal; it does nothing to improve definitions, it says nothing about how knowledge is really organized and stored in the head. An understanding of human information storage may be slow in coming or may never arrive. A psychologically improved lexicography may take less time. If it does, Dr. Miller may go on to something new. ''The reason I like this area,'' he says, ''is that it has been neglected by both psychologists and linguists. I try to mark off an area, get bright young people into it, then leave.'' Graphic Illustrations: photo of Dr. George A. Miller End of Document Fries With That? The New York Times

Time: 21/06/2001  
most criteria, the Polish author Stanislaw Lem is the premier science-fiction writer alive. For over 40 years he has been writing novels, plays, short stories, screenplays, literary criticism, sociological essays and studies of cybernetics and the philosophy of chance - 35 books in all, translated into almost as many languages, a total of 11 million copies sold. But despite his prodigious output and his acclaim, he has remained a literary force at a distance. He avoids interviews and says he has given only three or four in his life. Although Mr. Lem ordinarily lives year-round in Cracow with his wife and teen-age son, he is spending this year on a fellowship at the Institute for Advanced Study in West Berlin. At the institute he devotes himself to writing and catching up on the scientific news denied him by a year of Polish martial law. After a flurried exchange of telegrams, I arrived at his modest apartment on the outskirts of West Berlin with my collaborator on the interview, John Sigda, an environmental engineer from Boston. BY most criteria, the Polish author Stanislaw Lem is the premier science-fiction writer alive. Mr. Lem greeted us warmly, looking at age 61 a bit gaunter than the pictures on his book jackets. In addition to his usual spectacles he wore a hearing aid in each ear. Of average height, he had the build of a former athlete. A handshake like a vise reminded me that he had once worked as an auto mechanic. Enthusiastically he ushered us into the living room. He had offered to conduct the interview in Polish, German or Russian, all of which he speaks fluently. We had chosen English, however, and our interpreter soon arrived. Did you always want to be a writer?No, I never wanted to be a writer. I wanted to become a physician, the same as my father and my uncle before me. Then I was dissuaded from pursuing this career by the Lysenko affair. (The botanist Trofim Lysenko claimed that plants and animals can pass to their offspring characteristics caused by their environments. Under Stalin his theory became official Soviet doctrine.) I'm from Lemberg, which is now part of the Soviet Union. In 1946 I had come to Cracow to study medicine. When the first articles and essays about Lysenko were published in Pravda and the attacks on orthodox genetics started, I didn't like it at all. I soon understood that he had started to falsify biology. As was usual at that time in Poland, all my colleagues first had to serve in the army, and they became career army surgeons. Since I wasn't on too good a footing with the military, I didn't pass my last examination. Nobody could force me to give them the right answers. It was almost 30 years until I got my doctorate, an honorary degree from the technical university in Wroclaw. At the same time I also started writing poems for a Catholic weekly. We were in difficult straits. Writing stories came easily to me, so I started writing to earn some money and help my father, who was 73 but who still continued working in the hospital. I was 26 years old at the time. That was the beginning. It had nothing to do with science fiction. How did you become interested in science fiction? As a young boy I started reading H.G. Wells. There's no logical explanation, because there are many people who have read Wells and nothing came out of them. I also read Olaf Stapledon in English with a dictionary in my hand. And then, quite late -in 1956, approximately - I became familiar with American science fiction. Only then was I able to obtain these new books, starting with Heinlein, Asimov, etc. And most of them disappointed me because, after Wells and Stapledon, I'd imagined that, rising from these modest beginnings, science fiction must be becoming more sophisticated all the time. That was not the case. According to one of your literary agents, Franz Rottensteiner, you were at one time an honorary member of the Science Fiction Writers of America but were expelled for your attacks on American science fiction. Yes, I cannot read authors like Robert Silverberg. They're boring. I cannot read a utopian or science-fiction novel that is similar to previous novels or that leans toward pure fantasy. During the last six years I've stopped reading any science fiction. But I did not fall out of touch, because both my agents are fans of science fiction, and I ask them to tell me when anything really new appears.There was this and that, Ursula Le Guin's ''Left Hand of Darkness'' and ''The Dispossessed,'' and among Soviet writers I like the brothers Boris and Arkady Strugatsky. There might be a good novel somewhere else, but I don't know about it. Which non-science-fiction authors do you like, and which have most influenced you? There are lots of such writers. What I like as a reader is not necessarily closely related to what I'm writing about. In German poetry, for instance, I'm very found of Rainer Maria Rilke, who has no relation to my writing, at least as far as I know. Also Dostoyevsky and Conrad, and from the Poles Witold Gombrowicz, Stanislaw Witkiewicz, Boleslaw Lesmian as a poet and Czeslaw Milosz as an essayist. Cervantes, Swift -this list could be very long indeed. Actually, I am influenced primarily by various philosophers. Bertrand Russell, Ludwig Wittgenstein, for instance - the so-called Vienna Circle. To explain this I say that I am like a cow. The cow eats grass and gives milk. But grass isn't really like milk at all. Like the food, the information is being processed in my head, and its issue is books. I'm a hard nut to crack for literary critics in Poland because they're accustomed to putting an author into certain slots. They really have problems with me, but I don't feel guilty at all. You are now the best-selling and most prized author in Poland, as well as the most-translated author in the socialist world. And yet your writing is bitterly critical of totalitarian regimes and indeed of any political or social system that aspires to a final, perfect state. Can you explain why you have been acclaimed within a political system you have been so critical of? That's very complicated. Around 1950 I wrote my first sciencefiction novel, with the title ''The Astronauts,'' a book that nowadays gives me some pangs of conscience because it's so bad. I tried at that time to write the good Communist utopian novel. The intention was there. Although I had realized that the existing conditions in the country were bad, I had been nourishing hope for some time that gradually things would improve and that around the year 2000 they would be quite good. That's the time I was dealing with in the novel. Nevertheless, I wrote a second novel entitled ''The Magellan Nebula,'' even worse than the other one, and it was a utopian story pointing toward the year 3000. I wrote this in '51, when cybernetics had been banned as a false capitalist science. In order to get the novel through, I had to rename the field ''mechanioristics'' - I created a new term. But a very well-read and up-to-date editor in the publishing house noticed that this new term was similar to ''cybernetics'' and tore off my mask. And for that reason, for some time the book couldn't be published. Finally the first two books appeared in the Soviet Union in very large editions, between one and one-and-a-half million copies, and they are being published even now. From then on I was in a sanctified order and began to be published in all the socialist countries. And on this wave, this streamline, I continued to write. At that time there existed a certain naivete in the minds of the censors, because everything called science fiction wasn't watched so closely as contemporary literature. In Poland they called the genre ''freaks of the imagination,'' that is, nonsense that you don't have to pay attention to. This lasted seven or eight years, and then we had the purges - in the Soviet Union, that is - directed against nonconformist science fiction. Then the mystery was unraveled, and certain authors got into trouble. But by that time I had already written other books and had gained an international reputation. And having become, so to speak, the most prominent author in Poland, I received certain medals and state prizes. Have you ever been involved in Polish politics? Practically not. I was never a member of any political party. I am in a way a liberal. I am on the side of Karl Popper in his antihistoricism, and I believe that there is no other way of perfecting the human condition but by taking very little steps. All other methods can bring only misery. Did you sympathize with the Solidarity movement? Even if I really did sympathize with Solidarity, I saw the intrinsic dangers of it. The members were good-hearted and sincere but very naive and inexperienced and understood nothing at all of little or big politics. They would like to have politics as clear and sane and fine as the ghost of a saint, a very nice idea but not for this world. Were you at all affected by martial law? Because I was like Kipling's cat, going my own way, and belonged neither to Solidarity nor to the Communist Party, I was not imprisoned or otherwise affected by martial law. But I was not especially happy at this time. In Poland ever since the state of martial law I've been cut off from all scientific information, not for any political reasons but rather because there's no hard currency. Up to my exit from Poland, the United States Embassy in Warsaw was furnishing me with Newsweek and Scientific American, but they were not sufficient for my purposes. Here we have a large library, and everything they have I get at once. Do you think the release of Lech Walesa will revive Solidarity? No. He will be compromised or paralyzed in his doings. Not with a bang, but with a little whimper. We'd like to turn to your own writing. Can you say which of your own novels is your favorite? It's hard to say. It's like having children who grow up. It's very difficult for a father to say, ''This is my favorite son, and let the other one go to hell.'' It's far easier to tell you which of my books I hate, which ones have become poison to me. My first books, including ''The Magellan Nebula'' and another book which is in English, ''Return From the Stars,'' I don't like. Looking at it today, ''Return From the Stars'' is a simplified, one-dimensional story. If I were to write it now, I would do it entirely differently. But I have a rule never to return to what has been done before. And if I don't like it, I don't sell the foreign rights. For instance, I haven't sold ''The Magellan Nebula'' to anybody. Can you remember what was new for you in ''His Master's Voice''? Does it occupy a special place in your writing? Yes, indeed. At that time (1967) I attempted to write differently. I tried to put all of my ability, all of my life experience into this book. It was a critical point in my career because I stopped advancing into an unknown, distant future and started to approach the real world. This continues to be the way. The newer books have become humbler. I no longer try to tell about things the way I did in ''A Perfect Vacuum'' (a collection of reviews of nonexistent books on topics ranging from being to nothingness). Now I show a narrow section of the real world through a magnifying glass. Does Peter Hogarth, the narrator of ''His Master's Voice,'' represent your own viewpoint? Yes. Hogarth, that's me. I do not think that I identified with a hero so thoroughly and without camouflage elsewhere. Like Hogarth, many of your protagonists are middle-class or uppermiddle-class intellectuals, often scientists, who confront deep philosophical or emotional problems but not the basic economic and political ones of hunger, unemployment and oppression. And yet, being Polish, you can't help but see these problems all around you. Why have you not explored these areas? I have! But that work has not yet been translated. If you have become familiar with my writing through the English translations, you have gotten a different picture, a patchwork composed of parts of me. About half of my books have been published in the United States, and the selection of what is published depends on me only to a limited extent. In the Soviet Union my work has been published in tremendously large editions. ''The Chain of Chance'' was published there because politically it's innocent, it's neutral. But ''Memoirs Found in a Bathtub,'' which is an allegory of a totalitarian state with a spy in the system, has never been published there. Nor have several others. Generally, it's like this. For a publisher to derive a profit from a book, the book must sell. For instance, some of my books have not appeared in France, such as ''A Perfect Vacuum,'' although there is a very good French translation of it. My overall sales in the Federal Republic of Germany are one and three-quarter million, but in the United States only about half a million. So actually the American reader doesn't like me. The eggheads may like me, but they're not a majority of the readers. Very recently it became clear to me that when critics, for instance in the United States, refer to my texts as philosophical and believe that they're uttering praise, in reality they're repelling the public. Most people don't want philosophy. It has to be introduced like bitter medicine, in small doses. For this reason I do not expect ''His Master's Voice'' to be especially successful in the United States. We imagine another problem is translation. Your fondness for wordplay has been known to drive translators to distraction. Yes, there's always been the bottleneck of translation. I am aware of the fact that it's against my interests to use such intricate and difficult syntactical terms, which pose extreme hardships for the translators. But these are not considerations I'm guided by. If it hadn't been for the translator Michael Kandel, ''The Cyberiad'' would not have appeared in English. It has been published in Japan, but, not knowing any Japanese, I simply cannot imagine how it is translated. Your most recent book to have appeared in English - with the exception of new translations of older books - is ''The Chain of Chance,'' which was published in 1978, two years after the Polish edition. What have you written since then? My latest, which has just been published, is ''Wizja Lokalna'' - in English, perhaps ''The Official Hearing on the Spot.'' The hero is Ijon Tichy of ''The Star Diaries'' (a collection of voyages in shortstory form, a kind of space-age ''Gulliver's Travels''). He gives an account of a trip to a planet where there's a race of people who originate not from apes but from birds. A different work, ''Provocation,'' was printed in a literary magazine. It contains a review of an imaginary two-volume book written by a nonexistent German philosopher. I wrote it in such a way that there were scientists and historians in Poland who actually believed that it was a serious review of an existing book and tried to order it. I am now writing a new novel, and the working title is ''LEM,'' which stands not for ''Lunar Excursion Module'' but ''Lunar Expedition Misery.'' I've already completed the first chapter. The hero is the same as in ''The Star Diaries.'' The problem is this: On Earth there is total disarmament, but there are armaments on the moon. Each of the superpowers and some of the smaller states as well have their own sectors on the moon, and there they try to evolve military robots to replace human soldiers. Somehow communication between the Earth and the moon has been severed. There is quiet panic among all the general staffs on Earth because the weapons are up there and the generals don't know what's happening, whether or not the robots have become independent. My hero was supposed to have familiarized himself with what was happening on the moon in the Soviet sector, the United States sector and the Western European sector. Recently I hit upon the idea that his brain has been divided in two by the effects of ultrasound. There is a surgical intervention for the treatment of epileptics that does the same thing. I've seen the classic literature. After having studied all this material, I knew the actual symptoms. My hero returns to Earth knowing where he was - in fact, he's completely rational -but none of what he experienced on the moon is accessible to him because it is hidden in the right sphere of his brain. Now various secret intelligence services try to capture him to tap the right side of his brain to get at this information. After his condition is diagnosed, he tries on his own to establish contact with the right side of his brain by using his right and left hands in deaf-mute sign language. He starts to get an inkling, an initial phase only, but does not establish a real interview between the two halves. However, he is reckless enough to divulge this to one of his doctors. This doctor had been contacted by an intelligence agency, and the hero gets into hot water. So that's the initial situation, and now I'll go on from there. You mentioned robots, and certainly one of the most important themes in your writing is the equality of men and robots as thinking, sentient beings. Do you feel that artificial intelligence at this level will be achieved within the foreseeable future? My opinion is that in roughly 100 years we will arrive at an artificial intelligence that is more intelligent and reasonable than human intelligence, but it will be completely different. There are no signs indicating that computers will in certain fields become equal to men. You should not be misled by the fact that you can play chess with a computer. If you want to accomplish certain individual tasks, computers are fine. But when you are talking about psychological matters, every one of us carries in his head the heritage of the armored fish, the dinosaurs, the other mammals. These limitations do not exist outside the domain of biological evolution. And there's no reason why we should imitate them -the very idea is silly. In the field of mechanics it would be the same as if the Arabs were to say they didn't want airplanes and automobiles, only improved camels. Or that you shouldn't supply automobiles with wheels, that you must invent mechanical legs. I'm going to show you a book. ''Golem XIV'' is going to be published next year in America. It's a story about the construction of a supercomputer and how it didn't want to solve the military task it was given, the purpose it had been constructed for in the first place. So it started to devote itself to higher philosophical problems. There are two stories in ''Golem XIV,'' two lectures for scientists. In the first Golem talks about humans and the way it sees them, in the second about itself. It tries to explain that it's already arrived at a level that biological evolution will never reach on it own. It's on the lowest rung of a ladder, and above it there might exist now or in the future more potent intelligences. Golem does not know whether there are any bounds in its progress to the upper sphere. And when it, in a manner of speaking, takes leave of man, it is primarily for the purpose of advancing further up this ladder. In my own view, man will probably never be able to understand and recognize everything directly, but in an indirect manner he will be able to achieve command of everything if he constructs intelligence amplifiers to fulfill his wishes. Like a small child, he will then be receiving gifts. But he will not be able to perceive the world directly, like a small child who is given an electric railway. The child can play with it, he can even dismantle it, but he will not understand Maxwell's theory of electricity. The main difference is that the child will one day become an adult, and then if he wants he will eventually study and understand Maxwell's theory. But we will never grow up any further. We will only be able to receive gifts from the giants of intelligence that we'll be able to build. There is a limit to human perception, and beyond this horizon the fruit of observation will be gleaned from other beings, research machines or whatever. Progress may continue, but we will somehow be staying behind. End of Document Six Decades of Science Contest Prowess The New York Times

Time: 22/09/2014  
Ever since a distinctive three-armed logo appeared in the early '90s on the sleeves of the albums of Aphex Twin - the alias of the prolific electronic music producer Richard D. James - it has remained a vital emblem for dance music fans around the world. So when a lime-green blimp bearing that insignia appeared over London (and mysterious stencils of it appeared on sidewalks around Manhattan and Brooklyn) back in mid-August, electronic music fans rejoiced, knowing that after 13 years, a new Aphex Twin album was coming. Since his disappearance from public view, James's influence has only grown: His example led Radiohead to embrace electronic music throughout the aughts, he's been sampled by Kanye West and the electronic dance music poster boy Skrillex has called the Aphex Twin track "Flim" his favorite of all time. Tomorrow sees the release of "Syro," a double album on the pioneering electronic label Warp Records that finds the reclusive genius - now a father of two living in rural Scotland - at his mischievous, beat-twisting best. (It can be streamed here in its entirety; a Spotify account is required.) The record also shares a lineage with the eye-catching, face-distorting cover art of releases like 1997's "Come to Daddy" and 1999's "Windowlicker," again finding James collaborating with the groundbreaking firm The Designers Republic (TDR) on the visuals. Here, the collective's founder and creative director, Ian Anderson, chats with T about the thought process behind some of Aphex Twin's most iconic cover art. "Artificial Intelligence" compilation (1992)"I've always been interested by the idea of music made by machines. TDR was already knee-deep in synths when Warp Records was set up. I did the Warp logo and by the time of their Artificial Intelligence compilation in 1992 featuring an early Aphex Twin track, we'd already been shaping the look of the bleeps people were hearing out of Sheffield." "On" EP (1993) and "Ventolin" EP (1995)"We'd worked with Richard pulling together illustrations he supplied for these EPs. But I'm not sure I can ever come to terms with the fact TDR didn't design his famous logo." "Donkey Rhubarb" EP (1995)"We also did the 'Donkey Rhubarb' sleeve (which took an image of his smile from the cover of 1995's '...I Care Because You Do' and tiled it 25 times) in what turned out to be the first in a series of 'un-design' collaborations with Richard culminating ultimately in 'Syro.'" "Come to Daddy" (1997)"The 'Come to Daddy' imagery was something that festered and grew in the space between Richard and the phenomenal visual artist Chris Cunningham. We were supplied a series of images - some finished, others in progress or discarded - and we pulled them together into a cohesive series of designs across a number of formats." "Come to Daddy Remixed" (1997)"For us the key elements in the 'Come to Daddy' art were the typographic deconstructions of the photographic imagery and of the TV ad for Orange Mobile, which had used one of the Aphex Twin remix tracks. For copyright reasons we weren't allowed to show an image of the art, so we reduced the ad to a short descriptive text in reversed white out of orange." "Windowlicker" (1999)"Again, this was beautifully right/wrong thinking from Richard and Chris. I still don't know where their heads were at with that. What TDR did was edit the various shots from the video shoot and format them into a single image. The minimal type detail we used seems a natural choice now, but at the time there were serious arguments going off about how big the logo should be, whether there should be a more recognizable Warp/TDR graphic, et cetera." "Syro" (2014)"It's a continuing deconstruction of everything the audience might think they know, might think they want to know, might think they'd like to think about what is an album, what is the nature of communication, what is the relationship between maker and shaker, sound and listener, et cetera? 'Syro"s design is a provocation. It's a set of clues without a mystery. It's an inventory of a particular process peculiar to a peculiar industry. It's a bit of a grin." Load-Date: September 22, 2014 End of Document What's On TV Friday The New York Times

Time: 09/07/2014  
The future is obvious. It's the past that seems mysterious and alien. Television is beguiled by history, and not just chapter headings like World War II or the taming of the Wild West. Some of the more daring series right now explore recent epochs when cataclysm was muffled, and change rippled beneath the currents: the social combustion of the '60s on ''Mad Men,'' the demystification of sex on ''Masters of Sex,'' the Cold War on ''The Americans,'' the development of the personal computer on ''Halt and Catch Fire'' and, later this month, the building of the atom bomb on ''Manh(A)ttan'' (the project, not the borough). So ''Extant,'' a sleek science-fiction series on CBS, starring Halle Berry as an astronaut named Molly Woods, seems almost old-fashioned. The show doesn't look backward to a younger, more confident age of space exploration, and it doesn't look forward to a post-apocalyptic wasteland. Molly lives in a near future that seems a lot like the present 2.0: driverless cars, tablets, über-recycling trash compactors and bathroom mirrors that turn into television screens with one tap. Clothes haven't changed, but hairstylists have lost their bearings: Molly sports a pixie cut with winged bangs that dip dangerously over one eye. The most noticeable improvement is in artificial intelligence. Robots are so well engineered that they look and act like humans, and can even be programmed to behave as children. And that could be a blessing: There isn't a mother alive who hasn't at some point wished she could power down her toddler. But fertility problems still exist, which is only one reason that Molly is gobsmacked to discover that despite her own inability to bear children, she has returned from a 13-month solo mission in space with an unexplainable ''Alien 3''-ish side effect: pregnancy. She hasn't told her scientist husband, John (Goran Visnjic of ''E.R.''), who so yearned for a child that he designed a robot facsimile, Ethan (Pierce Gagnon), whom they raise as if he were a real boy. And Molly is afraid to tell her superiors at the multinational corporation that put her in space in the first place. The creators deserve credit for trying to revive this kind of classic science-fiction mystery. It's hard to find new ways to reconfigure the Frankenstein myth. Movies like ''I, Robot,'' Steven Spielberg's ''A.I. Artificial Intelligence'' and television series like ''Battlestar Galactica'' have run the gamut of robots; machines were turning malevolent long before ''2001: A Space Odyssey.'' ''Extant'' is both suspenseful and quite silly, a paradox that may be explained by its provenance. The series is a collaboration between Mr. Spielberg's production company Amblin Television and CBS Television Studios, which previously teamed up to make ''Under the Dome,'' a CBS summer series that is now in a second, and full-on ridiculous, season. ''Extant'' is more deft and sophisticated, and Halle Berry is a big star. But, as is the case with ''Under the Dome,'' the new series dilutes its own mystique with too many plodding plot devices and stock characters. CBS has made a lot of money by not overestimating its viewers: The promos on television and the Internet reveal pretty much everything important about the first episode, and that premiere ends with too few things left to the imagination. Children can almost never be trusted on this kind of fantasy thriller, so it's not surprising that the series early on suggests that Molly's sweet-faced little boy has a bad seed mixed in with his ersatz snips and snails and puppy dogs' tails. (If scientists wanted to make a really lovable robot, they would make one like R2-D2 or the unnamed robot in ''Lost in Space.'' Robots should be robots. It's when they're designed like humans that inhumanity slips in.) Themes are heavily underlined. On ''Extant,'' scientists try to make robots as human as possible; greedy business tycoons dream of turning humans into robots. Conspiracies lurk in all the likely places, and, sure enough, someone is bound to warn that it's not safe to trust anyone. It would be great if all those broad hints were misdirection, and things that are not as they seem proved to be genuinely different. But the premiere, while entertaining and expertly produced, doesn't hold out a lot of promise. Too often, the imagined unknown turns out to be more predictable than even the best remembered history. Extant CBS, Wednesday nights at 9, Eastern and Pacific times; 8, Central time. Produced by CBS Television Studios and Amblin Television. Steven Spielberg, Greg Walker, Mickey Fisher, Justin Falvey, Darryl Frank and Brooklyn Weaver, executive producers. WITH: Halle Berry (Molly Woods), Goran Visnjic (John Woods), Pierce Gagnon (Ethan Woods), Hiroyuki Sanada (Hideki Yasumoto), Michael O'Neill (Alan Sparks), Camryn Manheim (Sam Barton) and Grace Gummer (Julie Gelineau). http : // www.nytimes.com/2014/07/09/arts/television/extant-stars-halle-berry-as-a-space-traveler-with-a-secret.html Graphic PHOTOS: Extant: Halle Berry stars in this science-fiction series, starting on Wednesday on CBS. (PHOTOGRAPH BY DALE ROBINETTE/CBS) (C1) In ''Extant,'' Halle Berry returns from a 13-month solo mission in space. (PHOTOGRAPH BY SONJA FLEMMING/CBS) (C2) Load-Date: July 9, 2014 End of Document California Today: Gavin Newsom on a ‘Code Red’ for Housing Affordability; California Today The New York Times

Time: 25/11/2012  
OF LOVEBy Scott Hutchins 328 pp. The Penguin Press. $25.95. You could argue that the fundamental question behind all literature is: ''What does it mean to be human?'' Some people have even argued that storytelling itself is what makes us more than just monkeys with iPhones -- that Homer created the modern consciousness, or that Shakespeare (as Harold Bloom has it) invented the human identity. In recent years, however, literature has lost a lot of ground on that score to evolutionary psychology, neurobiology and computer science, and particularly to the efforts of artificial intelligence researchers. So as we wait for the Singularity, when our iPhones will become sentient and Siri will start telling us what we can do for her, many of the savvier fiction writers have begun to come to grips with the fact that the tutelary spirit of the quest for the human may not be Dante or Emily Dickinson or Virginia Woolf, but Alan Turing, the British mathematician who helped start the revolution in computing. Turing may be best known for his version of the Victorian-era Imitation Game, in which a judge receives written responses to his questions from a man and a woman behind a screen and tries to guess from the answers which is the man and which the woman. In Turing's version, the messages are from a human and a computer; it was his contention that when a judge couldn't tell the difference any longer, then a machine could be said to think like a human being. The Turing test has since become, at least in the popular imagination, the holy grail of artificial intelligence developers, as well as a conceit in contemporary fiction, and that conceit is at the heart of Scott Hutchins's clever, funny and very entertaining first novel, ''A Working Theory of Love.'' The novel's wisecracking narrator is Neill Bassett Jr., a 30-something native of Arkansas who now lives the life of a rootless metrosexual in San Francisco. Though he's not a scientist, he makes up one-third of a tiny computer start-up in Menlo Park, alongside an Indonesian programmer named Laham and their boss, an elderly European genius named Henry Livorno, who are working to create an artificial intelligence for a planned Turing test (which seems to be based on the annual Loebner Prize). Livorno has incorporated software into his computer that evokes the seven deadly sins, but more important, he has also loaded into its memory the 5,000-page diary of Neill's father -- the ''Samuel Pepys of the South'' -- an Arkansas doctor who killed himself when Neill was 19. Neill's job, as the real Dr. Bassett's son, is to participate in a series of conversations with the programmed ''Dr. Bassett'' in order to make -- its? his? -- responses more lifelike. As a result, Neill finds himself engaging every day with a clever, if creepy, simulacrum of his dead father, leading him inevitably into a quest to find the reasons for the real doctor's suicide. Meanwhile, the novel also chronicles Neill's feckless quest for love in San Francisco. He's just gone through a divorce, and as the novel starts, he's coming to the end of a period of revolving-door hookups, the last of which, with a troubled and impressionable young barista named Rachel, has the possibility of turning into something more. Not long after he starts seeing her, however, Neill finds himself flirting again with his ex-wife, and not long after that he finds himself in bed with a brusque but energetic young programmer for a rival company. (Her boss, a charismatically amoral former student of Livorno's, is the founder and chief executive of an online dating company, who is leading a much better financed effort to win the Turing test.) In addition to all this, the novel encompasses Neill's relationship with his mother, his return to Arkansas to get at the truth of his dad's suicide and a good deal of expertly observed, if gentle, satire of life in the Bay Area. That's a lot of ground to cover even for an ambitious novelist, and one could easily imagine Don DeLillo or Richard Powers running with the same ideas and cast of characters for 800 pages or so. And while this is a very accomplished novel, it feels a bit as if Hutchins has given short shrift to its most original and exciting element: the philosophical struggle with the Turing test. The scenes in which the researchers volley with ''Dr. Bassett'' are the most electrifying in the book, and even though the journey through family history and the story of Neill's romantic and sexual escapades are beautifully written and consistently engaging, I found myself eager to get back to the undead doctor, who in his halting, awkward fashion is the most affecting character in the book -- much the way his direct ancestor HAL was the most lifelike character in Stanley Kubrick's ''2001: A Space Odyssey.'' That said, at the heart of Hutchins's attempt to bring these plotlines together is a brilliant insight into the underpinnings of the Turing test in logical positivism: namely, the idea that the best you can say about consciousness, either human or machine, is that if the mind you're dealing with seems conscious, then it is conscious, that in a positivist universe there is no difference between seeming and being. Hutchins then takes this a step further, by having Neill apply, or at least try to apply, that argument to his love life, and while I'm not sure the novel quite brings it off -- the Turing test, when it happens, is surprisingly anticlimactic, and Neill's romantic conflict resolves itself pretty much the way you suspect it will -- simply raising the question in such an original way yields unexpected dividends. Hutchins is an unsentimental and compassionate creator of vivid characters, a master aphorist (''Artists are always the Johnny Appleseeds of gentrification'') and an expert architect of set pieces, not the least of which is a hilariously crass and creepily persuasive monologue by the matchmaking king, which takes online romance to its logical conclusion. You'll never think of the term ''computer dating'' the same way again. A novel is itself a kind of advanced Turing test, in which a writer tries to convince readers that lifeless signs on a page are not just real intelligences moving through the real world, but actual human beings, with lustful urges, deep regrets and breakable hearts. As this novel demonstrates, part of the challenge of giving a machine a truly human intelligence is making it sound humanly unreasonable. Turing predicted that in order to pass his test, a machine would have to fool a judge at least 30 percent of the time, but Scott Hutchins, in this charming, warmhearted and thought-provoking novel, already has that beat. http : // www.nytimes.com/2012/11/25/books/review/a-working-theory-of-love-by-scott-hutchins.html Graphic PHOTO (PHOTOGRAPH OF SCOTT HUTCHINS BY MICHAEL SHINDLER/PHOTOBOOTH) Load-Date: November 25, 2012 End of Document 'Weird Science' The New York Times

Time: 17/04/2014  
Johnny Depp, who’s built a brilliant career despite many of his lamentable film choices, may not be the first actor you think of to play a genius — much less humanity’s destroyer or savior. But he’s weirdly perfect in “Transcendence,” an inelegant, no doubt implausible (maybe not) science-fiction film about a futurist whose consciousness is uploaded onto the Internet. There, he (or a mysterious vestige of his being) expands like the universe, growing larger and mutating into a being who is godlike and yet far from divine, sort of like a star at the apex of his popularity. Directed by Wally Pfister, a cinematographer making his feature directing debut, “Transcendence” is a dark, lurchingly entertaining pastiche of age-old worries, future-shock jolts, hot-button topics and old-fashioned genre thrills. It was written by Jack Paglen, who, while researching, probably thumbed through Mary Shelley’s “Frankenstein; or, the Modern Prometheus,” along with some Isaac Asimov and William Gibson. The scientist here is Will Caster (Mr. Depp), whose work in artificial intelligence has landed him on the cover of Wired magazine. (Even in a brave new world, old media remains useful shorthand.) With his wife, Evelyn ( Rebecca Hall), a computer scientist, Will has created PINN, one of those supermachines with sleek surfaces, blinking lights and pulsating menace. The twist in “Transcendence” is that the scientist becomes the monster of his own creation or so it seems. Shortly after the film opens, Will is shot by an extremist during a series of coordinated attacks on high-tech targets. He survives the initial assault only to succumb to the radiation that laced the bullet. As he lies dying, Evelyn, in one of those eureka moments that implies her brain is as infinite as her husband’s, initially uploads Will’s consciousness into PINN, a clever bit of business she manages with their friend Max Waters (a solid Paul Bettany), a neurobiologist. One minute Will looks like a tortured lab monkey; the next, he’s the ghost in everybody’s machine. Well, it sounds plausible or at least Mr. Pfister moves fast enough that you don’t have time to puzzle over niceties like logic. Like some other notable machine-based intelligences — including the ship’s computer in the original “Star Trek,” CORA in the television series “ Battlestar Galactica” and Samantha in Spike Jonze’s recent film “Her” — PINN has a female voice. It may be that the enduringly creepy legacy of HAL 9000, the mutinous computer from “2001: A Space Odyssey,” has made it tougher for male voices to fill in these disembodied characters. Whatever the case, while artificial intelligences with any kind of human voice seem at once familiar and uncanny, further blurring the line between makers and their machines, those with female voices also suggest another creation story, that of Adam (the origin) and Eve (the product). “Transcendence” plays with this idea, and it’s not for nothing that its heroine is named Evelyn. Once Will’s consciousness is uploaded, his voice supplants PINN’s. In its initial poetic fragmentation, the voice emanating from Evelyn’s reconfigured supercomputer sounds amusingly like Marlon Brando’s tape-recorded ramblings as Colonel Kurtz in “Apocalypse Now.” (Mr. Depp and Brando were friends.) After some throat clearing, though, Will starts to sound like himself and the movie gets its crazy on. His image pops up on screen, like some holographic specter, a kind of rebirth that thrills Evelyn and freaks out most everyone else, including, naturally enough, the extremists. Implausibly led by a scowling half-pint, Bree (Kate Mara), they try to stop Will and Evelyn, in a chase that also pulls in other scientists and government agents played by the likes of Morgan Freeman and Cillian Murphy. Mr. Pfister, shooting on film and working with the cinematographer Jess Hall, gives “Transcendence” the dark, gleaming surfaces that gloss up a lot of contemporary thrillers and which can’t help evoking Christopher Nolan’s work. Mr. Pfister has been the director of photography on most of Mr. Nolan’s films, including the “Dark Knight” trilogy, and Mr. Nolan has given “Transcendence” his blessing by signing on as an executive producer. So it’s no surprise that the depthless blacks and glowing whites in “Transcendence” and Mr. Pfister’s use of negative space suggest Mr. Nolan’s influence, notably in the high-tech complex where Evelyn and Will set up a compound. When Evelyn walks down one of its luminous white halls, she looks as if she’s headed right for one of Bruce Wayne’s lairs. These visual echoes don’t hurt “Transcendence,” and they soon recede amid the escalating narrative noise. Mr. Pfister handles the predictable third-act action booms adequately — it must be contractual that every director who makes a thriller these days must blow his sets to smithereens — but he’s better when the story scales down. When Evelyn appears in that white hallway, Mr. Pfister is showing off the production design, but he’s also bringing you close to a woman who, as Will’s power expands, is becoming progressively more isolated. One of those actresses who always seem smart even in dumb roles, Ms. Hall is very sympathetic as a woman in love and then in fear who, scene by scene and with palpable tenderness, takes over the film as Will gobbles up the world. To an extent, “Transcendence” can be filed alongside other movies about fanaticism that have emerged since Sept. 11. Yet, for all its topical gloss and technobabble, it also draws from older, familiar preoccupations about the nature of being, which, along with Mr. Pfister’s eye and largely smooth handling of his actors, accounts for its modest pleasures. However predictable and ridiculous, the film raises the question of what — as the machines rise — makes us human and why, which certainly gives you more to chew on at the multiplex than is customary these days. In “Frankenstein,” the monster tells his creator, “I ought to be thy Adam, but I am rather the fallen angel.” This is the warning that pulses through many dystopian fictions and which here finds another beat. “Transcendence” is rated PG-13. (Parents strongly cautioned.) Dystopian violence. Transcendence Opens on Friday. Directed by Wally Pfister; written by Jack Paglen; director of photography, Jess Hall; edited by David Rosenbloom; music by Mychael Danna; production design by Chris Seagers; costumes by George L. Little; produced by Andrew A. Kosove, Broderick Johnson, Kate Cohen, Marisa Polvino, Annie Marter, David Valdes and Aaron Ryder; released by Warner Bros. Pictures. Running time: 1 hour 59 minutes. WITH: Johnny Depp (Will Caster), Rebecca Hall (Evelyn Caster), Paul Bettany (Max Waters), Cillian Murphy (Agent Buchanan), Kate Mara (Bree), Clifton Collins, Jr. (Martin) and Morgan Freeman (Joseph Tagger). PHOTOS: Transcendence: From left, Morgan Freeman, Cillian Murphy, Johnny Depp (on screen) and Rebecca Hall in Wally Pfister’s science-fiction film, opening on Friday. (C1); Johnny Depp stars as an artificial-intelligence scientist and his uploaded consciousness. (PHOTOGRAPHS BY PETER MOUNTAIN/WARNER BROS. PICTURES) (C9) Load-Date: February 7, 2017 End of Document The Hunt for the Bombing Suspects The New York Times

Time: 27/01/2012  
By Robert Harris 286 pages. Alfred A. Knopf. $25.95. The title of Robert Harris's new thriller, ''The Fear Index,'' comes from the volatility index, or VIX -- also known as the ''fear index'' -- which measures expectations of violent swings in the market, as Wall Street watchers know from the harrowing meltdown of 2008. This fleet-footed, if sometimes hokey, novel takes place in the rarefied world of hedge funds, featuring one that has achieved huge returns by short-selling and using trading algorithms that ''thrive on panic.'' It's an energetically researched tale based on one of the back stories to the crash of 2008: bankers' hiring of physicists to devise hugely complex trading programs that few really understand, and those new strategies running dangerously amok. It's also a familiar story of hubris and its fallout. In fact, ''The Fear Index'' -- like such recent novels as Kevin Guilfoile's ''Cast of Shadows'' (2005) and Laurence Gonzales's ''Lucy'' (2010) -- is a variation on that ever-popular template, Mary Shelley's ''Frankenstein.'' Once again, we're introduced to a scientist who dares to play God by creating a new form of life (in this case, a computer program named VIXAL that evolves into a form of artificial intelligence). Once again, that new being leaves a spiral of havoc in its wake. To underscore the Frankenstein parallels, Mr. Harris sets his novel in Geneva, where Mary Shelley conceived the idea for the original, and uses as an epigraph to his opening chapter a quotation from that earlier novel: ''Learn from me, if not by my precepts, at least by my example, how dangerous is the acquirement of knowledge, and how much happier that man is who believes his native town to be the world, than he who aspires to become greater than his nature will allow.'' Weaving copious research into a breathless narrative, much as he did in his historical best sellers, ''Fatherland'' and ''Pompeii,'' Mr. Harris in the opening chapters does an agile job of limning the elite world inhabited by Dr. Alexander Hoffmann. He is a brilliant scientist who helped create computer systems used to analyze data generated by the giant particle accelerator known as the Large Hadron Collider near Geneva and who is now the brains behind a wildly successful hedge fund that uses secret algorithms, based on his earlier work on ''emergent machine reasoning.'' Once given a task, Hoffmann's program can, in theory, ''operate independently and teach itself at a rate far beyond the capacity of human beings.'' One incarnation correlates ''recent market fluctuations with the frequency rate of fear-related words in the media -- terror, alarm, panic, horror, dismay, dread, scare, anthrax, nuclear.'' Along the way Mr. Harris introduces us to the quantitative analysts, or ''quants,'' at Hoffmann Investment Technologies, who have helped their boss's machine deliver the fund's astonishing 83 percent returns: geeks who are a far cry from the macho masters of the universe depicted in so many Wall Street novels and movies. He also introduces us to the phenomenally rich investors, who have allowed the company's slick frontman, Hugo Quarry, to talk them into handing over their millions to a computer program. Expounding upon themes that will be familiar to his loyal readers, Mr. Harris explores both the promises and perils of technology, and, as in his first novel, ''Fatherland'' -- which imagined what might have happened if Nazi Germany had won World War II -- he expertly conjures a paranoid world where everyone seems to be watching everyone else. Hoffmann, who bears more than a passing resemblance to Tom Jericho, the gifted and high-strung World War II code breaker in Mr. Harris's ''Enigma,'' suffers a head injury when he surprises an intruder in his house. After this harrowing encounter, he begins to suspect that someone is not only stalking him, but also perhaps impersonating him. His e-mail and bank account may have been hacked and used to make mysterious purchases; the security codes at his home appear to have been stolen; and his office, too, seems to be under surveillance. Mr. Harris intermittently manages the delicate balancing act of making the reader wonder whether the VIXAL algorithm, like HAL in ''2001: A Space Odyssey,'' has in fact gone rogue, or whether Hoffmann is losing his grip -- perhaps his head injury has affected his thinking; perhaps he's having a nervous breakdown, as he did years ago. At one point Hoffman muses that ''VIXAL was purely mechanical and possessed no emotion or conscience'' -- that it ''had no purpose other than the self-interested pursuit of survival through the accumulation of money,'' but if ''left to itself, in accordance with Darwinian logic,'' it would ''seek to expand until it dominated the entire earth.'' One could ''no more pass moral judgment on it,'' he thinks, ''than one could on a shark. It was simply behaving like a hedge fund.'' Oddly enough, Mr. Harris turns out to be considerably more adept at making the complicated fiscal strategies employed by hedge funds comprehensible to the reader than he is at persuading us that VIXAL could have actually made the leap to artificial intelligence. There is a series of scenes that cleverly dovetail events in the story with the ''flash crash'' of May 6, 2010 (when the Dow fell more than 600 points in a matter of minutes), but the later sections of the novel feel increasingly silly and contrived, like excerpts from a bad Michael Crichton novel. In the end, VIXAL seems less like a plausible villain than like a metaphor for the greed and heedlessness that overtook Wall Street around the turn of the millennium and that resulted in the calamities of 2008 and their continuing reverberations. http : // www.nytimes.com Graphic PHOTO (PHOTOGRAPH BY THE TIMES/NI SYNDICATION) Load-Date: January 27, 2012 End of Document Alan Turing, Enigma Code-Breaker and Computer Pioneer, Wins Royal Pardon The New York Times

Time: 08/09/2013  
Stroll among the games at the Cosmopolitan, the newest casino on the Las Vegas Strip, and you might be overwhelmed by the latest whooping and flashing gambling machines. All the high-resolution monitors and video effects, devoted to themes ranging from deep-sea-fishing expeditions to Spider-Man to the unsubtlest visions of cash washing over lucky winners, are only the most obvious signs of technology's move onto the casino floor. Behind the scenes, server-based gaming now enables managers to rapidly alter payouts, raise or reduce betting minimums, even change games themselves. (In just minutes, a bank of slot machines styled for dance clubbers can be rethemed to appeal to church ladies on a Sunday afternoon.) But a few deceptively prim-looking machines represent an even greater technological leap, the biggest advance in automated gambling since Charles Fey introduced the one-armed bandit in 1895. They owe the way they play to artificial intelligence. The machines, called Texas Hold 'Em Heads Up Poker, play the limit version of the popular game so well that they can be counted on to beat poker-playing customers of most any skill level. Gamblers might win a given hand out of sheer luck, but over an extended period, as the impact of luck evens out, they must overcome carefully trained neural nets that self-learned to play aggressively and unpredictably with the expertise of a skilled professional. Later this month, a new souped-up version of the game, endorsed by Phil Hellmuth, who has won more World Series of Poker tournaments than anyone, will have its debut at the Global Gaming Expo in Las Vegas. The machines will then be rolled out into casinos around the world. They will be placed alongside the pure numbers-crunchers, indifferent to the gambler. But poker is a game of skill and intuition, of bluffs and traps. The familiar adage is that in poker, you play the player, not the cards. This machine does that, responding to opponents' moves and pursuing optimal strategies. But to compete at the highest levels and beat the best human players, the approach must be impeccable. Gregg Giuffria, whose company, G2 Game Design, developed Texas Hold 'Em Heads Up Poker, was testing a prototype of the program in his Las Vegas office when he thought he detected a flaw. When he played passively until a hand's very last card was dealt and then suddenly made a bet, the program folded rather than match his bet and risk losing more money. ''I called in all my employees and told them that there's a problem,'' he says. The software seemed to play in an easily exploitable pattern. ''Then I played 200 more hands, and he never did anything like that again. That was the point when we nicknamed him Little Bastard.'' The pokerbot, which takes on one challenger at a time, can trace its roots to the Norwegian Defense Research Establishment in Kjeller, Norway. Until 2002, that's where an engineer named Fredrik Dahl worked on artificial intelligence for secret government projects on combat simulations. The job involved using neural networks. Functioning much like an extremely focused, one-dimensional version of the human brain, these complex computer algorithms develop strategies that emerge through so many repetitive mathematical calculations that few humans could reproduce, much less endure them. Dahl's work on two-sided, zero-sum games, where there is no mutual interest, proved to be useful in developing strategies to win not only wars but also poker games. He started with backgammon, though. While a student at the University of Oslo, where he concentrated on computer science, he developed a penchant for the game. He once made it to the finals of the Norwegian National Backgammon Championships. ''One thing I learned from backgammon is how to handle losses, no matter how well I play,'' he says. ''It is not a good game for sore losers.'' Rather than be sore, he used computers to improve his play. Dahl created a neural net that predicted the probability of winning a backgammon match from each position on the board, at every possible stage in a game. Any individual situation is easy enough to solve, Dahl says; the challenge was determining all possible situations, giving value to the importance of each one and choosing a play. ''The program needed to self-train and discover these strategies itself,'' Dahl says. Dahl spent a year working part time on his program and started selling it by mail order in 1997 for $250 a floppy disk. He figures that he sold thousands of copies, and that its impact was even broader thanks to the pirating of his software. Among those whose play it improved was a Texas-based actuary named Malcolm Davis, whom Dahl describes as a top backgammon player in the world at the time. Davis and Dahl ended up talking over backgammon strategies. In 2000, Dahl began work on a similar program for poker. He was inspired by the challenge of creating a program that could come up with solutions for a game characterized by incomplete information. Unlike backgammon, in which an opponent's position is visible, a poker player does not know what another player's cards are and so cannot follow pure strategies. Instead, he needs to consider a range of hands that his opponent might have and estimate the best response to the various possibilities. The uncertainty, combined with an opponent's ability to bluff, makes it difficult to write software that plays poker effectively. Dahl gave his neural nets rudimentary game-playing instructions and programmed them to probe for weaknesses as they played one another. ''They computed probability, based on the other player's actions,'' Dahl says. ''I had the neural nets play training games and experiment with various approaches.'' Eventually, through trial and error, he says, ''they learned to be successful.'' Dahl recalls staring at his computer screen, watching his neural nets compete, when he saw one of them make a fairly sophisticated bluff known as floating. You do this by playing passively, initiating no bets and matching the ones that your opponent makes. If, after the turn card is played, your opponent does not bet, you do. His slowing down usually means that he had been overplaying his cards with the hope that you would fold or his hand would improve. Your bet here signals that you've just made a strong hand or that you have been inducing him to put as much money as possible in the pot because you have had a superior hand from the start. ''At first, I wasn't even familiar with that strategy,'' Dahl says. ''Later, I thought it was amazing that the neural net could come up with a known, successful strategy on its own.'' Even as Dahl recognized the improvement and appreciated that his software played better on its five-billionth hand than on its two-billionth, he dismissed any commercial application for it as too difficult. ''I started doing the poker project for fun,'' he says. ''Then, in 2003, Malcolm talked me into doing it for real.'' Doing it for real meant creating a machine that could be put in casinos. As originally designed by Dahl, the brain of his game adjusted to the opposition. If, for example, an opponent folded a lot, it played aggressively; if it faced aggressive play, it tried to trap. Casino commissions, however, mandate that a gaming machine cannot change its playing style in response to particular opponents. A poker game must play a World Series of Poker champion the same way it does a neophyte, so Dahl's machine would not be able to learn from its experience in a casino. ''The neural net's learning needs to be frozen'' is how Dahl puts it. Yet it would also have to play well enough so that few humans could consistently beat it. For Dahl, now 46 and a natural pessimist, this was a predicament he did not think he could overcome. ''I thought that if it is vulnerable to even one person's strategy, that is a huge problem -- then other people learn how to do it, and the machine collapses,'' Dahl says. Dahl eventually retooled his neural net so that it would teach itself to play a perfectly defensive game. Rather than steer it to study its opponent and try to capitalize on weaknesses, the net was directed to make itself as hard to beat as possible. ''Ordinarily, you figure out weaknesses in your opponent and find ways to exploit those weaknesses,'' Dahl says. ''But because our program needs to be stable, it can't do that. So instead it does everything it can to prevent itself from being exploited. The theory behind it is almost paranoid.'' Dahl's game grew more unpredictable over time, as the neural nets learned. Eventually, it got to the point where, over thousands of hands, they would each orchestrate the optimal number of bluffs; but in any one hand, the program might do anything. What's more, a second neural net, which plays in a slightly different style, was introduced to reinforce the machine's unpredictability; when an opponent has a reduced stack of chips, a third net takes over and plays in a manner customized for that situation. Like three tag-team fighters, the nets alternate against an opponent. At random moments, the machine's mode of play might change the level of its aggressiveness. By 2006, after thousands of neural nets, tweaked repeatedly, had played billions of hands, Dahl recruited gifted poker-playing friends to take on his game. It won frequently enough to hold up in a casino environment, he thought. Malcolm Davis then brought it to the attention of Bob Hamman, a frequent backgammon opponent of his and the bridge partner of Bill Gates. Though Hamman ranks among the world's top bridge players, he plays cards only as a hobby. He makes his living by insuring promotional contests (like those at company outings where attendees might win $10,000 for sinking a 30-foot putt, for example). Intrigued by the software's potential, Hamman tested it against both other poker-playing programs and a young bridge master named Justin Lall. ''Justin also happens to be a skilled poker player,'' Hamman says. ''He's skilled enough that if you think you want to make a living playing against Justin, you might want to reconsider. He said it's a good game. He found it captivating. He came close to beating it.'' Soon after, in October 2006, Hamman called Gregg Giuffria, a neighbor of Gates's at the Del Mar Country Club in Southern California, where both had homes. Giuffria was once better known as a member of the hard-rock band Angel, but now he ran a company that made gambling machines. After a bit of small talk, Hamman told him about Dahl's software. ''It's real smart,'' he said. ''I thought it was only interesting. But then you play against it and realize that it's bluffing you. All of a sudden, you're talking to steel and glass like it's human.'' By the time Giuffria heard from Hamman, he had already wandered far from arena stages. He took the first step in 1990, 15 years after Angel's first album came out, when he had a life-changing dinner with Lee Iacocca, the former Chrysler chairman. (Giuffria's wife, April, knew Iacocca as a family friend.) ''I thought I was not the dumbest guy at the table,'' Giuffria says, ''but the dumbest guy on the planet.'' He suddenly saw himself as a 39-year-old ''white boy chasing rock 'n' roll, with hip-hop coming in -- it was time for me to reinvent myself.'' Days later, he cut his hair and, on the advice of Iaccoca, began analyzing patents that the Defense Department was allowing to be released to the public sector. The hope was that Giuffria would discover an unexploited business opportunity and maybe Iaccoca would partner with him to develop it. Giuffria came across a company called Summit Systems that held a patent for a mathematical process that had an application for slot machines. Iaccoca passed, so Giuffria used royalties from his music career to acquire rights to the patent from the moribund company and eventually helped sell them to International Game Technology, now the world's largest manufacturer of slot machines. ''In one afternoon,'' Giuffria says, ''I made more money from that patent than I had in 18 years of touring, writing songs and getting gold records with Angel.'' That success hooked Giuffria on the gambling industry. He and Iacocca collaborated on casino developments around the country. Later, Giuffria built a Hard Rock casino near New Orleans and got into creating gambling machines. ''It's all entertainment,'' Giuffria says, when describing the transition from rocker to gaming entrepreneur. Giuffria liked the sound of what Hamman had to offer. What's more, Giuffria had not forgotten the valuable lesson he learned in 1998 when he passed up a chance to invest in Triple Play Draw Poker, a video-poker machine that turned out to be one of the most successful games of its type. Had Giuffria made that earlier investment, he'd be a billionaire today. Not long after Hamman first called, he and Malcolm Davis flew from Dallas to meet Giuffria in Las Vegas. ''They showed me a gray screen on a computer,'' he says. ''It dealt cards, you played for units, it tallied who won and lost. It was in a very stark form, but, like Bob said, as soon as it started bluffing against me, I realized that this was the most incredible thing I had ever seen. I wouldn't let it walk out the door.'' Giuffria decided to develop the card-playing software into an actual casino machine, knowing that it would cost more than $5 million to devise a prototype with a case, monitor, graphics and sound effects. For starters, he and his tech guys needed to test each neural net. But because these had been developed through self-training and not created by humans, there was no source code -- the computer instructions written out by programmers -- to analyze. You couldn't track the logic behind the system's actions. ''We had to take a black-box approach,'' says Bob Honeycutt, Giuffria's lead engineer on the project. They had to look at the results without being able to know how they were produced. Honeycutt customized math-based programs that look for probabilities to play poker against Fredrik Dahl's neural nets. Honeycutt's software lost. The neural nets showed no patterns or anomalies. Next, local poker pros dropped by to test it out. Mike (the Mouth) Matusow, famous for his loquaciousness, ''came over and treated the machine like it was one of his buddies,'' Giuffria says. ''He'd say, 'What, are you drawing down on me with a pair of 4s?' Some pros came in here, sure that they can beat the machine, and then left angry when they couldn't. It really upset people.'' The visceral reactions pleased Giuffria, who saw value in the personification of the machine. ''A lot of people who play this are interested in live poker, but they are too intimidated to jump in there,'' says Anthony Lucas, professor of casino management at the University of Nevada in Las Vegas. ''[This] gives them a chance to play without running the risk of being judged or embarrassed for making a bad move. This is private. Nobody criticizes your strategy.'' In addition, he says, it's perfect for a generation that likes to lose itself in Angry Birds: ''If you prefer not to interact or socialize with people, you can play this game the same way you would watch TV or go online.'' Convinced that he had a market -- and confident that players wouldn't worry about the legitimacy of the ''cards'' dealt by the machine any more than they do about the house's dice being loaded -- Giuffria moved ahead. His team created digitized cards, chips and green felt and added realistic sound effects. Before Giuffria showed his machine to I.G.T., which had the right of first refusal to whatever games he created, he sent it to the New Jersey-based Gaming Laboratories International, a kind of Underwriters Laboratories for casino gambling. ''We asked them to punch holes in it,'' Giuffria says. It usually takes about a month to test a game, but G.L.I. kept Dahl's neural nets for about nine months. Giuffria asked how humans would do against it. ''Oh,'' he recalls the lab telling him, ''they'll get killed.'' Because a never-beatable game will not succeed in a casino, the machine was programmed to occasionally play in a weak, passive style, seeming to reduce the game's edge and re-engaging casual players. The result is that this game ''gets accused of having leaks,'' Giuffria says; posters gloat online about its weaknesses. Inevitably, he adds, the take-away is: " 'Of course I will beat it.' They don't know that it might be one of the hands that falls into a gray area where the machine takes a dive deliberately.'' Giuffria seems to take the knocks personally. Nevertheless, he does not correct the mistaken impressions. ''No way did I want to put out there that not only do we have a machine they can't beat, but we've spent two years trying to dummy it down so that it doesn't beat humans all the time. That would have made enemies. We kept our mouths shut.'' Natasha Dow Schull, an associate professor at M.I.T. and the author of ''Addiction by Design: Machine Gambling in Las Vegas,'' describes the experience of playing Texas Hold 'Em Heads Up Poker as feeling as if you're taking on ''a really good medieval automaton'' with ''a little man behind the curtain.'' Giuffria seems to prefer not to break this humanizing spell, so that players who experience the occasional wins will believe that the machine is beatable. ''Gamblers continually overestimate their abilities,'' says Mike Dixon, a psychology professor at the University of Waterloo in Ontario with a specialization in gambling. ''It's like hitting a half-court shot occasionally and thinking it makes you into Carmelo Anthony.'' The game has developed a small but fervent fan base since its slow-drip release began two years ago, with about 200 machines so far located in Las Vegas, Mississippi and California (all states where live versions of poker thrive). When it appeared on the casino floors of Bellagio and Aria, Las Vegas casinos where some of America's highest-stakes poker games take place, Texas Hold 'Em Heads Up Poker captured the imaginations of big-money players. A very few poker professionals, particularly those who specialize in one-on-one limit Texas Hold 'Em, actually have a shot at winning regularly. Michael Reed, a pro gambler from Pittsburgh, credibly claims to fall into that category. So far, over the course of 500 hours, he says, he averages about $135 per hour in profits, playing at the $20- or $40-bet level. This means that by making the maximum bets throughout a hand, he can win or lose $500 in seconds. He has not seen many others turning a profit. ''Over all, this machine crushes people,'' he says. ''The machine is far too aggressive and steals far too many pots.'' How does Reed manage to overcome a machine that has been so hard to beat? He says it ''gains its edge by being the aggressor. It almost never check-calls, or simply matches an opponent's bet without a raise. The bot gives credit to your hand when you raise and reraise.'' Unseasoned players, Reed says, have a habit of folding hands that might seem inferior. Reed has discovered that playing connecting cards like 7 and 8 can have unexpected value. ''If a high card comes on the flop, the machine often folds to a bet from you, believing that you have made a high pair. So you have the middle range [of flopped cards] from which you can make hands, and the high range from which you can bluff. If you don't bet, the bot will want to.'' It's been estimated that Reed is among 100 or so people in the world who can steadily beat the machine. I relayed this to Bill McBeath, Aria's former president and a high-stakes poker player in his own right, and he laughed. McBeath said that when somebody tells him that he can beat the machine, his reply is: " 'Come back and see me in a year, pal.' The game does not have a statistical advantage over players, but the imperfections of human capabilities mean that it inevitably wins.'' I started to explain Reed's experiences, and McBeath cut me off. ''Look, there was a 24-year-old who had beaten it for a while. Now he's broke. And I think this machine had something to do with his demise.'' Only 200 Texas Hold 'Em Heads Up Poker machines are now in circulation. Triple Play Draw Poker can have 100 machines in a single casino. As part of the effort to get closer to this level, the new Hellmuth machine and another new one created with Johnny Chan (who ranks No. 2 in World Series wins) have more than just the endorsements of the poker pros. Their styles and personalities have also been added to the machines. The Pro Series will incorporate neural nets that seem to play according to Hellmuth's tight but forceful approach or the aggressive strategy that inspired Chan's nickname, The Orient Express. Brian Perego, a movie-industry veteran, recorded Chan and Hellmuth repeating their favorite lines -- ''I dodge bullets, baby!'' is one of Hellmuth's -- and expressing various reactions that will be played on the machines' video monitors. ''When a hand starts to get serious, Phil might put on his sunglasses,'' Perego says. ''It will be fun, but there will be psych-out moves, just like at a real poker table.'' The technology behind Dahl's game has the potential to do a lot more than simply taking money from casino customers. Dahl could see it being adapted to make credibility assessments, like deciding who should get a loan, for example, by analyzing applicants in comparison with databases of borrowers who repaid their loans and those who did not. Hector Levesque, a professor of computer science at the University of Toronto who specializes in A.I., also sees the bigger picture for this sort of technology. ''Pushing hard on statistics and learning [via neural nets] can have a big impact,'' he says, while cautioning that that should not be mistaken for having the ability to think in the multidimensional, contextual sense. ''The biggest technology coming out of A.I. is getting examples of reasonable behavior and learning from statistics. Google search does so well because it has to do with statistics and adjusts from that. Same with the driverless car. Airline pricing is basically a game, played against people who want to buy tickets. The airline comes up with a price that is not high enough to discourage customers but still maximizes profits. Poker and games are not so far from things that have real economic bite if you can train the neural nets properly.'' For now, however, Dahl's interest is in whether Texas Hold 'Em Heads Up Poker can withstand the onslaught that will come with wider exposure. Back in Vegas one Sunday afternoon, I caught up with Johnny Chan on the gaming floor of MGM Grand Hotel and Casino, where he was about to play in a baccarat tournament. ''I get e-mails all the time, with people challenging me and wanting to play me heads-up,'' Chan said. ''They'll get a chance to do it with this machine.'' I asked him if he thought anyone could win big over the long haul, beyond what Mike Reed has managed to grind out. ''Nothing is impossible,'' Chan said. Then he added that some people see Texas Hold 'Em Heads Up Poker as a potential gold mine. ''You probably have five groups out there right now, testing the machine, writing down all the results, getting every play blow by blow and figuring out what to do on every hand. One hundred percent, I'm sure there are teams working on it.'' The pokerbot just put its sunglasses on. http : // www.nytimes.com/2013/09/08/magazine/poker-computer.html Graphic DRAWINGS (DRAWINGS BY TIM ENTHOVEN) (MM45 MM46 MM47) Load-Date: September 9, 2013 End of Document College of Future Could Be Come One, Come All The New York Times

Time: 28/11/2004  
The American International Toy Fair, first held in New York City in 1903, has met there every year since except one (1945). It's the global toy industry's most important showcase, now filling, every February, two major venues -- the Jacob K. Javits Convention Center and, at 200 Fifth Avenue, the International Toy Center. But it was not until my second day of wandering the fair last winter that I finally saw the toy I knew I wanted. The fair was about to close. I was hurrying from floor to floor in the Toy Center, trying to see as much as I could, when I turned a corridor, and there it was, displayed in a showroom window: a robot. It was a dynamic-looking machine, with broad chest and shoulders, narrow waist, chunky legs, long arms and highly functional-looking tri-pronged claws. Probably Japanese, I thought. It was a toy robot, but one that looked as if it could do real robotic things -- walk, move its arms and use those claws. With those electronic eyes, it might even be able to ''see.'' The toy was called Robosapien, and the company that made it, Wow Wee, was not Japanese after all. Newly published clippings, taped to the glass, described Robosapien as the high-tech hit of the fair. In the showroom, a few people from Wow Wee were talking to an enormous man with a build not unlike that of the robot. He stood ramrod straight and had a round, friendly face and a trim beard; the felt hat and the safari shirt he wore gave him an Indiana Jones aspect. Mark Tilden, a robotic physicist formerly of Los Alamos National Laboratory and NASA, invented Robosapien, or at least the prototype, in an intense three-week effort in 2001. Tilden, who is in his 40's, described it as ''the first real mass-marketed humanoid robot.'' I was told that it would be commercially available the summer of 2004 for $99. By comparison, Robosapien's best-known competitor in the field, the Japanese Sony AIBO robot dog, costs $1,900; Sony has also developed a 23-inch state-of-the-art humanoid entertainment robot, called QRIO, but should it ever be put on the market, it will probably cost as much as a luxury car. In his booming, grandiloquent voice, Tilden began a highly scientific-sounding explanation of why Robosapien's price was so low -- something to do with his pioneering work in analog robotics, which uses simple electronics parts and imitates the natural physics of nature rather than computer-driven digital mechanics. Remote controller in hand, the roboticist sent the little humanoid walking across the floor, torso lurching from side to side -- Robosapien walks something like an infant Popeye. Rather than speaking words, the robot emits sounds: it growled like a samurai, belched and wolf-whistled while waving a claw as if at some passing beauty. Supplying its own perky techno-music score, the robot even danced, rocking its hips and hoisting its long arms in the air in time to the beat. Then Tilden said something that I understood: ''You can make him pick your dirty socks off the floor and carry them to your closet.'' You could also program Robosapien to guard a closet or to keep your cat off your desk. Everyone, children and adults, has dreamed of having a robot that could perform tedious chores and serve as a ''companion'' as well. It was easy to imagine a child being enlivened by a robot that he can make walk around and do things, but Tilden also suggested that the toy could engage tech-savvy adults in new ways as well, in ways that their PlayStations perhaps no longer can. (Tilden later told me that he was especially tickled by ''a guy in Florida'' who bought 20 Robosapiens and programmed them to salute his Darth Vader doll.) At a university in Hong Kong, he said, a group of female students were rehearsing ''Romeo and Juliet'' with a troupe of 16 Robosapiens sent by Wow Wee. It occurred to me to ask about how dialogue would be programmed into an individual robot only after Tilden had announced that he had to leave that instant or he would miss his red-eye to Hong Kong, where he and Wow Wee are based. ''Robots are the last unfulfilled promise of the 20th century,'' he said before dashing off. To someone who grew up watching ''The Jetsons,'' ''Lost in Space'' and ''Star Trek,'' that immediately rings true. Countless things that used to seem like science-fiction fantasies were realized during the last century, but robots, especially the helpful, companionable, humanoid ''I, Robot'' variety, are obviously among those that did not. If you were born 50 years ago, at some point in your life you have surely expected such robots to have become a reality by now. The future arrived in the mail a few weeks later: my first Robosapien. ''It can pick up socks,'' I told Aura, my fiancee. We unpacked the toy, set it on the floor and inserted two D batteries in the bottom of each foot. Aura found and pressed the power-on button below the shoulder blades. Like the Terminator -- an ''artificial human'' ancestor from the fantasy world of special-effects movies -- Robosapien has red electronic eyes, but they glow benignly. When you pick it up, you feel as if you are holding a living plastic-armor-plated cat. I was impatient with the instructional manual, but as I held the remote, I resigned myself to having to rely on it. Aura, of a generation more at home with gadgetry, blithely disregarded the manual and soon had our robot taking its first shuffling steps. It walked into a wall. An illuminated sensor embedded in its palm touched the wall first, and somehow that made the robot say, ''Ouch, ouch, ouch.'' Robosapien's wide, sturdy legs and tugboat-like feet kept moving, and slowly, his upper torso lurching pendulum-like from side to side, he turned one strenuous step at a time away from the wall and walked across the open floor. Of course, via the remote, you can make Robosapien turn before it hits a wall. It can perform karate chops. It can pick up a plastic cup and hurl it (not very far) into the air. Its demo button will make it perform all 67 of its functions. The word ''robot,'' originally coined by Karel Capek in his futuristic play ''R.U.R.,'' comes from the Czech word for forced labor. A robot must be able to perform tasks -- and Robosapien can, depending on your skill. You can make it pick up your socks, but for the ordinary user, it can take a long time. A plastic cup is far easier. Theo and Jacob Landsman, the 10- and 8-year-old sons of friends, have named their Robosapien Bleepy and are currently rehearsing it for a surprise Thanksgiving-dinner performance certain to astound all present except their wised-up parents. When we spoke, Jacob had just made his Robosapien karate chop his older brother in the head ''to see if it would hurt.'' (Not much.) Of Robosapien's three modes, red, orange and green (identified by buttons on the remote), Jacob's favorite is orange, because it is the best ''if you want comedy,'' he said. ''I happen to like the dancing most. When I showed it to my baby sitter, she laughed so hard.'' Theo knows how to program Robosapien so that it will run through 14 functions in a preselected order -- for example, dancing, followed by karate chops, followed by high-fives and finally a burp. For the Thanksgiving surprise, Bleepy will lurk, seemingly asleep, in a corner throughout the meal, then suddenly stride forward, toward the dinner table, making all its noises. Theo, via the remote, will then send him into the ''all demo'' mode. There are philosophers of the future and experts on the subjects of robotics and artificial intelligence who are certain that on some far-off day the most pressing moral issue humans will face will be how to distinguish ourselves from lifelike machines. Maybe we will even have joined them, evolving into cyborgs, hybrid human-machines. Such speculations far outpace the current stage of robotics. The field, for all its advances, is still in its infancy. Some scientists have predicted that the real advances in robotics will not occur in university or government labs but in entertainment robots like Robosapien, conceived to appeal to consumers. In a remarkable scholarly book, ''The Secret Life of Puppets,'' Victoria Nelson argues that our sense of the supernatural and yearning for immortality has been displaced from religion to such expressions of popular culture as superheroes, robots and cyborgs. We want robots that will perform chores for us, but want them for deeper, more mysterious reasons, too. There was something stirring about watching Robosapien in its arduous struggle against the wall: its turning itself around had even seemed like an act of learning and decision, the consequence of a hard-earned deduction. Anyone watching might have had the uncanny sensation of witnessing the first primal steps of the new robot ''species.'' In the world's most renowned robot-development labs -- those of Honda and Sony and the Artificial Intelligence Laboratory at M.I.T. -- much of the work centers on the robot's ''brain'': the multimillion-dollar supercomputers programmed to drive and coordinate the robot's sensors, functions and movements. The discipline is full of stories of fabulously engineered, computer-driven robots that perform impressively in the lab but crash in the field. Tilden, who invented BEAM robotics, earned a maverick reputation by taking another approach. BEAM, an acronym for ''biology, electronics, aesthetics and mechanics,'' replaces digital processing with analog circuits. Tilden employed minimalist electronics -- even spare Walkman parts, pieces of old Atari processors -- to construct ''mechanical life forms'' that interact with their environments. Rather than the ones and zeroes of digital processing, analog circuits produce continuous waves, allowing mechanisms to mimic the pendulum dynamic of animal movement. Robosapien gets up to 20 hours of continuous battery life because of Tilden's energy-efficient analog mechanics. In 2000, at the Bradbury Science Museum in Los Alamos, where some of his robots were exhibited, Tilden told an interviewer: ''We started out years ago on the assumption that rather than try to evolve a robot from some sort of intelligence, which has always seemed to have failed, we would evolve robots by themselves, starting out with the very simplest of devices and then working our way up, to see if we could eventually try and build humanoid-like devices that would interact with us on our own particular level,'' all the while keeping the technology simple. ''This is the end point of a really long lifetime compulsion,'' Tilden told me this summer. We were in his cramped walk-in-closet-size office in Wow Wee's Hong Kong headquarters, filled with prototypes and samples of his toys in various stages of their development and all manner of electronics parts. In his stentorian, straight-faced manner, Tilden said: ''I could have been a decent husband and father, but instead here I am giving birth to robots that are basically an extension of my own personality. Here I am on the front line of the robot wars, building the largest private robot army for market domination. I am a NASA scientist! I am a James Bond villain, right?'' He let loose a deep, rumbling Falstaffian laugh. It was June, and Tilden was just back from Robosapien's official launch in Great Britain. Since I had last seen him in New York, Robosapien had made two dozen ''best of'' toy lists, including Parenting magazine's. Wow Wee's factory in Shenzhen was turning out more than 5,000 Robosapiens a day in the long run-up to the Christmas season. One and a half million Robosapiens have been sold worldwide -- against original estimates of 50,000 in the first year. (The robot is sold in the United States in the usual toy venues, as well as in stores like Best Buy and the Sharper Image.) During the 1980's, as a student of physics and engineering at the University of Waterloo in Canada, Tilden discovered his calling. He became an obsessive robot builder but also discovered the limitations of the sci-fi dream. It was impossible, for example, to teach his robot vacuum cleaner not to vacuum up entire rolls of toilet paper or the cat kibble out of the pet's dish. The absurdity of building a half-million-dollar robot to ''clean your toilet'' to this day remains one of his vehement criticisms of much of contemporary robotics. Tilden's robot science became a search for radical simplicity. He invented BEAM robotics in 1988. He was eventually recruited to join the physics department at Los Alamos National Laboratory -- ''an E ticket to Disneyland for scientists,'' as he put it. Inevitably, though, Tilden's analog convictions clashed with the prevailing digital certainties of his contemporaries. From Los Alamos, he also worked with numerous other government agencies, like NASA. An invitation to work with the Santa Fe Institute and its artificial-intelligence lab should have been a roboticist's dream opportunity, but instead it encapsulated his frustrations. Santa Fe's scientists ''brought me down and showed me their big secrets, which were like computer models of little things moving around, doing little things, and they said, 'Build robots that do this,''' he recounted. ''And I had to turn to them and say, like Scotty from 'Star Trek': 'I'm sorry, Captain. I can't change the laws of physics. What you have here is a complete computer fantasy: robots that already travel in straight lines, perfect energy sources, nonelastic solids, robots that can pull and push a thread.' It was all virtual. In Super Mario, the physics are adjusted to the reality of the game, rather than actual reality. I could not build robots that matched their computer fantasies.'' Wow Wee's founder and president, Peter Yanofsky, saw Tilden on the Discovery Channel in a program called ''Robots Rising'' in 1998. Tilden and his BEAM robotics, his insectlike machines and the multiple creations of his robot ''Jurassic Park'' were featured. Yanofsky turned to his wife and said, ''I can make money with Tilden.'' Soon after, Yanofsky contacted him. Tilden began consulting part time for Wow Wee while he worked at Los Alamos. But in 2001, after leaving Los Alamos to become a full-time consultant, he worked nonstop for 21 days building the first Robosapien prototype. In 1998, Yanofsky sold Wow Wee, which was then doing $60 million in sales annually, to Hasbro. That $3 billion company was attracted to Wow Wee because of its successful Animaltronics and Dinotronics toys -- for example, its vividly animated T. rex dinosaur. Yanofsky stayed on with the company, believing that under the toy giant's umbrella, Wow Wee would have even more latitude to engage in developing cutting-edge toys. But the move proved to be a mistake. Hasbro canceled Robosapien several times, and Wow Wee shrank to a $15 million company. Refusing to let Robosapien die, Yanofsky amicably negotiated out of Wow Wee's contract with Hasbro last year. ''They didn't believe in what we were doing,'' Yanofsky told me. ''They didn't think there was a need. Their top brass asked, 'Where's the play value?''' The need that Yanofsky perceived was that the world was now full of PlayStation-savvy older children and young adults and that no one was catering to their sense of play offline. ''What about the guy who says, 'I want a robot!''' Yanofsky said. ''The virtual world dominates the toy industry. You play with a cartoon on a screen. For years, the software business has been getting all the young creative guys, but now we have scientists and geeks who want to come in on our development thing. We want people who are creative and eclectic and can take this industry to where the software industry is.'' After Tilden finished his first Robosapien, during a summer spent in Telluride, Colo., he sent it to Hong Kong and moved there not long after. That prototype, just over a foot high, sits on a crowded shelf in his office. With its spare metal construction, it looks something like a space-age Giacometti sculpture. Its limbs are driven by a controller comprising 24 transistors, enough to make a decent radio. He gave it specially designed hands and a vision mechanism and eight motors ''perfectly synchronized, without any digital programming at all.'' From then to 2004, a handful of ''robot-animation guys'' worked with Tilden on a sequence of Robosapien prototypes. Some of the key members of the Robosapien team were young American and European engineers and software specialists working in Wow Wee's office. Others were local people, typically graduates of Hong Kong universities and technical institutes that offer programs like a three-year diploma in creative-toy and intelligent-product technology. Others were from mainland China, employed by the vendors' factories in Shenzhen, where Robosapien is assembled and where much of the most crucial engineering and premanufacturing work on the toy was done. (Vendors compete for the contracts to manufacture products at their plants in China and then also provide the labor.) Wow Wee's most difficult problem was how to get the vendors to understand the technology behind Tilden's prototypes. At first, Wow Wee's best engineers didn't grasp it, either. For six months, Tilden gave once-a-week courses in his analog, nonlinear-control technology in Wow Wee's office, for its own and the vendors' engineers until, Yanofsky recalled, ''they started to get a foothold about what this mad scientist was talking about.'' Robosapien's success would depend on Tilden's being able to win over the people who had to be involved in the development of his toy. The vendor's job is to translate a prototype's functions into something that can be manufactured beneath a certain price point -- in a business in which the cost of manufacturing is a product's biggest expense. The challenge would be to sell Robosapien at a price acceptable to consumers of toys rather than of high-tech electronics products. Wow Wee finally found a vendor factory that understood the engineering well enough, but then that vendor went bankrupt. ''We were out driving around,'' Tilden recalled, ''trying to rescue our robots from Dumpsters so our rivals wouldn't get them.'' Soon after, the Wah Shing plant in Shenzhen became Robosapien's main manufacturer. ''Robosapien is like a walking lobster -- the shell holds him up,'' Tilden explained. ''On the assembly line, you build him back to front. He has a hexagonal frame and a navel, and everything -- his toes, his fingers -- is the same distance from that navel. If you see a robot that looks like it was built on draft paper, that is a conventional digitally-based robot. My controllers are based on triangles. In biology, if you take a cell, which is basically a round thing, and stuff a lot of them together, they'll form triangles, triangles, triangles forever.'' But a key compromise had to be made. The realities of manufacturing were such that Tilden and the engineers from Wow Wee and Wah Shing had to find a way to approximate Robosapien's analog controllers digitally. In the summer of 2003, Tilden spent eight straight days at the Wah Shing plant with Edward Chan, a Wah Shing electrical engineer, and a small team of other engineers. Tilden literally acted out and performed the robot's functions, even the Robosapien dance, and Chan, at the computer, turned them into code. In June, I went with Tilden, Phillip Duffy, Wow Wee's head of research and development, and others from the company to the Wah Shing plant. We took the train into Shenzhen's free zone, a capitalist development zone in mainland China, and were met by a driver and van. Then we drove deeper into a landscape of explosive growth, where the bleakly massive constructions of standard Communism serve the demands of a booming capitalist manufacturing economy. Each factory is an individual little fortress-hamlet, each with its own resident workforce and security gates out front. The Wah Shing plant employs a workforce of 2,000, many of them young female assembly-line workers. In the rooms housing the machinery amid which they work, usually in pairs, there are wooden shelves along the walls holding tea cups, one cup to each girl, in a variety of styles, imprinted with their names, a touching assertion of individual identity given the inevitable uniformity of their occupations. A simple gray rug marked the spot in an isolated corridor where Tilden, Chan, Ariff Cheng, Dickson Fong and the others had their collaborative breakthrough. Fong, a Wow Wee quality-control engineer, recounted the drama of that crucial week in animated if rudimentary English: ''See the clock! Job not done! We need to stay here, work with the electrical engineer. The clothes no change, the underwear no change.'' He made a noise like pugh! While Tilden demonstrated the robot's motions, and Chan wrote the code, Cheng and Fong solved other problems, like the robot's crooked walk. They traced the problem to the hardness of the plastic in Robosapien's feet. There are five little buttons, or toes, on the bottom of each foot, and the problem was corrected by making three of those toes of hard plastic and two of a softer one. Just off that corridor in Wah Shing was the room where two young women, named Zhang and Ha, have one of the most important jobs in the plant. Former ''stars'' of the assembly line, they decided how the robot would be put together, step by step, by the assembly-line workers. The two women had built, by hand, the robots I saw at the toy fair in New York five months before -- ''a smoke-and-mirrors act,'' Tilden cracked, for at that point, the robots were not ready to go into mass production. More so than will be the case in future Wow Wee humanoids, Tilden made many of the final decisions about the toy's development. He decided on its appearance and character. Should the robot be like a Japanese TV robot? RoboCopish? ''Star Wars''-like? Tilden wanted it to be a robot that looked like a robot and was ''pure bot,'' without any merely decorative features. Tilden insisted that the robot not speak English, or any other language. Instead, he told me, ''I put my own body gestures and even sounds in there.'' When the machine grunts, it is Tilden's recorded grunt you hear, his ''ouch,'' wolf-whistle and belch. If the original prototype had 24 transistors, Robosapien has millions in one small, intricately patterned board controlling all seven motors and one tiny chip holding 12 kilobytes of programming. Tilden recalled: ''We took analog, converted it into digital, through my skills and the skills of many designers, and came up with a seven-motor design that basically beats any of its rivals by up to five times in price.'' On the day of Robosapien's official Hong Kong debut in June, Wow Wee's office was full of local reporters. A dozen robots, connected by their small infrared control signals, did the Robosapien dance together -- an arresting sight. Tilden regaled the media with his sometimes extravagant claims of his robot's abilities. The ordinary user who can't make his Robosapien do much more than pick up a plastic cup may eventually lose interest in the toy. Some users have posted such complaints on amazon.com. But Robosapien possesses what toy engineers like to call ''play depth.'' Presumably anyone, whether child or adult, should be able to master the manual's level of play. But you can also go deeper and explore the remote on your own. Robosapien has 28 hidden functions that do not appear in the manual. For example, you can shut the robot down, and ''when he dies,'' as Tilden put it, ''the last word he says, and it's the only English word he has right now, is ''Rosebud'' -- which is from Orson Welles's 'Citizen Kane.' If you remember, you wait the entire movie, and you find out Rosebud was the name of his favorite toy. So just imagine the poetic symmetry. Just before Robosapien dies, he has a dream of another toy.'' Beyond the possibilities of the remote and the hidden functions, there is yet another level of play. ''This baby is designed to be hacked,'' Tilden said. For many, that's where the real fun will begin. People have posted video clips on the Web of Robosapiens playing one-on-one basketball (very crudely) and a strangely suspenseful video of a Robosapien slowly pulling a door open with a length of rope and exiting through it. Servo Magazine sponsored a Hack-a-Robosapien contest. Indeed, for some sophisticated hackers, Robosapien's limits are even an invitation. In an e-mail message from his Web site, aibohack.com, a hacker who goes by the name RoboSapienPet expressed the hope that people who grow bored of Robosapien's built-in features will be inspired to experiment. On his Web site, RoboSapienPet explained to me in an e-mail message, ''I do a number of robot and computer 'hacks' and share information, advice and free software to people who have similar robots or consumer electronics devices.'' He considers Robosapien more ''remote-control toy'' than robot but wrote that ''it is a reasonable toy to take apart and modify ('hack'). Simple modifications are possible, as well as brain transplants and brain augmentation. However it is not designed to be overly extensible for robot experimenters . . . at least not enough to my liking.'' Robosapien's low-cost production is what limits these possibilities, in comparison, for example, with the far more expensive AIBO robot dog. RoboSapienPet's modifications for Robosapien are posted at www.aibohack.com/robosap. They include ''adding a second microprocessor to take control of the robot,'' providing ''higher brain functions,'' including ''a PC interface and many other things.'' Another modification includes affixing a low-power sensor for mobile robots to give Robosapien ''self-contained vision and the ability to react differently based on the objects it sees (especially the color).'' Some of those functions, especially involving vision mechanisms, sounded like what I had heard Yanofsky and Tilden discuss in regards to Wow Wee's future humanoids. In August, I received an e-mail message from Chan, who reported that he and Tilden had just spent another two intense weeks holed up at Wah Shing. Will their next generation come closer to blurring the line between ''really cool toy'' and true interactive robot home companion? If so, that portal to the ''Jetsons''-like future will have been more Toyland than NASA. The morning after the launch, looking over the news accounts of the event, Yanofsky shook his head, smiled wryly and said: ''Why can't Mark stick to the script? They ask him why he left the science world to work in toys, and instead of a serious answer, he says, 'Because there are no children to make toys for on Mars.''' http : // www.nytimes.com Graphic Photos: Mini-Me: Standing 14 inches tall, Robosapien is a little bit human and a whole lot analog. While it has its creator's ''physique'' and sounds like him, millions of transistors control its seven motors and a chip with 12 kilobytes of programming. Pure Bot: Stages in the design process to create a robot without any purely decorative features, from an early schematic in 2002 (top) to a near-final stage of design development in 2003 (bottom). Walk Man: Wide, sturdy legs and tugboat-like feet may give Robosapien the gait of a baby Popeye, but the robot can dance. To program those moves as well as all the other functions, Mark Tilden acted them out, and an electrical engineer turned them into code. (Photographs by Tom Schierlitz for The New York Times)Drawings (Drawings from Wow Wee & Knickerbocker) Load-Date: November 28, 2004 End of Document Mining the Minds of the Masses The New York Times

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it possible anymore for an audacious theater artist to go ''too far''? As experimental theater and performance activity reaches a peak of excitement around Manhattan this weekend, performers will be flinging down the gauntlet to fearless, inquiring audiences in work that tests as many different kinds of limits as there are artists willing to defy convention. Their techniques range from dissolving the fourth wall (the environmental comedy troupe Artificial Intelligence), to gender bending (the playwright Holly Hughes, the character comedian Jeffrey Essmann, Mabou Mines' gender-reversed ''King Lear'') to food and obscenity slinging. At the Kitchen, the notoriously sloppy Kipper Kids will anoint each other with food and explosives, while at Performance Space 122, Karen Finley will level the world with torrential profanities. At La Mama, Ellen Stewart, the godmother of experimental theater, is presenting ''Mythos Oedipus,'' a ''nonverbal'' dance opera she has conceived and directed. At the Performing Garage, the Wooster Group is performing Richard Foreman's ''Symphony of Rats,'' a futuristic political pageant featuring giant rat puppets. Meanwhile, at Dance Theater Workshop, Ann Carlson's ''Animals'' offers a beatified vision of relationships between man and beast. In a cultural climate where cable television helps propel talented cult performers into the mainstream in record time, at least one or two of these artists are likely to achieve national recognition within a year and become stars whose reputations transcend the downtown scene. Eventually, one can expect large cultural institutions like Lincoln Center and the Brooklyn Academy of Music to include some of this border-crossing work in their programming. One of the main hubs of avant-garde activity this weekend is P.S. 122, which is holding its seventh annual benefit celebration, with four different ''all star'' shows that blend music, theater, film and performance. Another is La Mama, where in addition to the first performances of ''Mythos Oedipus,'' the high-minded comedian Jeffrey Essmann and the acclaimed Brazilian actress and mime artist Denise Stoklos are offering solo performances. ''This year's benefit features a larger than usual number of 'new music' artists,'' Mark Russell, the director of P.S. 122, said the other day. They range from the accordionist Danny Mydlack to the pop band They Might Be Giants to the gospel-rap of the trio Thought Music. In theater and performance art, one of the high points of P.S. 122's shows this weekend will be an excerpt from ''Lear,'' a cross-dressed version of ''King Lear,'' by the experimental theater troupe Mabou Mines. ''Lear,'' directed by Lee Breuer and featuring Ruth Maleczech as the aged king and Greg Mehrten as a drag-queen Fool, has created some excited word of mouth since early work-in-progress performances began at the George Street Playhouse in New Brunswick, N.J. Other high points of the marathon are likely to be Karen Finley performing an excerpt from her scabrously obscene monologue ''The Constant State of Desire,'' the Alien Comic (Tom Murrin) dressed as an electrified lemon tree, and an appearance by David Leslie, the Evel Knievel of performance artists. Mr. Leslie has been known to wind himself in bubble wrap and then jump from a three-story building onto a steel plate. ''This year's programs are marked by extreme contrasts,'' Mr. Russell said. ''On the same program with David Leslie you have Sarah Skaggs, an improvisational dancer whose work is very lyrical.'' Given the exceptional range of limits being tested on Manhattan stages this weekend, the lines one chooses to consider crossing come down to matters of taste in genre, language and sex. Adventurous playgoers interested in experiencing a total theatrical immersion that is entirely benign in spirit might wish to attend the three-and-a-half-hour event known as ''Tony and Tina's Wedding,'' which begins at Washington Square Church in the West Village and winds up at Carmelita's, a reception hall at 150 East 14th Street. The event, created by the 25-member comedy troupe Artificial Intelligence, begins with an actual church ceremony uniting two fictional characters, Valentina Lynn Vitale (Tina) and Anthony Angelo Nunzio (Tony), portrayed by Nancy Cassaro and Marc Nassar. The full-scale reception at Carmelita's that follows the ceremony features food, wine, dancing and entertainment, but don't expect the luxurious fare to be had at ''Tamara.'' Baked ziti is the order of the day. What a spectator will find at ''Tony and Tina's Wedding'' is a contemporary Italian-American soap opera with multiple dramas crackling on all sides. After a while, the line between theater and life begins to blur. 'Became So Real' '' 'Tony and Tina' evolved when Marc and I were in college and found ourselves the outcasts of the drama department,'' said Ms. Cassaro, the company's guiding spirit as well as the blushing bride to be. ''We were doing improvisations of a young couple having a fight, and they became so real that the dorm master called wondering what was the matter. It snowballed as we enlisted other friends who created other characters.'' The latest incarnation of the wedding involves some 25 performers, each playing a character with a fully imagined personal history. ''Tina comes from a middle-class family in Elmhurst,'' Ms. Cassaro explained. ''When her father made it big in the trucking business, the family moved to Floral Park.'' Among the other characters are Tina's gay brother, who is an aspiring video director; her former boyfriend who has recently returned from a drug rehabiliation clinic; her pregnant maid of honor, and the groom's father's stripper girlfriend. During the reception, guests are encouraged to dance with the bride and pin dollar bills on her gown as the band plays ''We Are the World.'' In various corners of the room, friends of the couple discreetly sniff cocaine (the white powder the actors use is actually a baby laxative). Ms. Cassaro emphasized that the troupe's attitude toward the world of Tony and Tina is affectionate. ''What we're satirizing is the real world,'' she said. ''If you don't believe me, just hang around the Queens Center Mall and listen and look. It's wild, and it's real.'' How Messy Is Funny A very different kind of performance art can be found at the Kitchen, where Martin Von Haselberg and Brian Routh, the music-hall vaudevillians better-known as the Kipper Kids, are performing ''Into the Box, Out of the Box,'' a piece that incorporates several of their infamously messy comic bits. The duo met in 1971 while studying drama in London (Mr. Von Haselberg is German, and Mr. Routh English), and quickly discovered they had identical alter egos, which they named Harry and Harry Kipper. For several years they lived roles that have been called ''a scatological Laurel and Hardy.'' Their stage attire consists of tie-dyed jock straps, shower caps and large false noses. In a famous routine that has been incorporated into their new show, they smash eggs on each other's heads, douse themselves with flour, paint and canned spaghetti, and top it off with swirls of whipped cream that are exploded with firecrackers. They have been known to leave a mess on audiences as well as themselves. ''It's not a chaotic food fight, but a very carefully choreographed ceremony,'' Mr. Von Haselberg said of their food-and-firecracker routine in a recent interview. ''We're very specific about the food we use and its color and texture. It is a ritual we perform with the seriousness of a priest performing a religious ceremony, though the intention is completely silly.'' ''Into the Box'' includes iconoclastic performances of several songs from ''West Side Story,'' accompanied by rude, explosive sound-effects. They also perform songs made famous by the 30's English music-hall team of Flanagan and Allen. When the Kipper Kids became the scourge of the New York performance-art circuit during the 1970's, some critics labeled their work Dadaist and compared them to Marcel Duchamp and Alfred Jarry. ''Though we won't reject the comparisons, we never sat down and consciously tried to revive the Dada movement,'' Mr. Von Haselberg insisted. ''Being a Kipper is the most creatively satisfying and therapeutic thing we know.'' Recently, the duo was discovered by cable television. They have formed a production company, and next month work will begin on what they hope will turn into a continuing comedy-adventure series for Cinemax. They are also featured guests on Bette Midler's upcoming Home Box Office special, ''Mondo Biando.'' Mr. Von Haselberg happens to be married to Ms. Midler. Refined Wit Jeffrey Essmann, the gifted 35-year-old comedian who is appearing at La Mama tonight through Sunday, is as refined as the Kipper Kids are slobbering. In his untitled show, Mr. Essmann impersonates nine different characters. They range from a murderous-minded little boy to a drunken Barbie Doll to an aged nun. In the quality and refinement of their writing, Mr. Essmann's best routines transcend character comedy to become literature. The most elaborate monologue, ''The Passion of Patsy,'' is a scathingly amusing sendup of the sort of historical play in which a single character reminisces ponderously about the past. This particular memory play recalls the life of Nadia Porchnik, a mythical Croatian poetess, also known as Patsy, whom Mr. Essmann imagines to have been the girlfriend of Gavrilo Princip, the real-life assassin who triggered World War I. ''For a long time, I wanted to do a piece about a horrible one-woman show, but to do it I had to study all the Balkan wars,'' Mr. Essmann said. ''I wrote 'The Passion of Patsy' for a woman who refused to perform it, so after it had been lying around for a year, I finally decided to do it myself, and people found it funny.'' Some of the other characters in Mr. Essmann's show are drawn from his Wisconsin background. The funniest is Sister Bernice, a frowning, supertitious fourth-grade parochial school teacher who introduces herself to a new class of students with the admonition, ''There's an easy way to remember my name - just remember you'll burn if you're not nice.'' Mr. Essmann moved from Wisconsin to New York in 1974 to be an actor. He evolved his comic style in cabarets and downtown performing spaces. ''Although I've worked in comedy clubs, I've never been a fan of observational standup humor,'' he said. ''I've been drawn more to performers like Lily Tomlin and Ruth Draper.'' His other ingenious characterizations include a grown-up Barbie Doll who has become a pill-popping alcoholic, an aerobics teacher named Bobby Lance who instructs his students in relaxation to imagine they are being licked by a herd of deer, which are then shot. In ''Heaven and Mr. Taylor,'' Mr. Essmann portrays a child who persuades a teen-ager who is a local Good Humor man to kidnap and hold for ransom his older siblings. The monologue is delivered in a 1950's kindergarten version of film-noir dialogue. Humor as surreal and rarified as Mr. Essmann's obviously requires some special handling, and his fondest dream would be to take his show Off Broadway to a small downtown theater. It deserves such a run. La Mama, like P.S. 122, offers a smorgasbord of experimental performance styles. In addition to Mr. Essmann's final performances this weekend, it is presenting Denise Stoklos, whose one-woman show ''Mary Stuart'' won enthusiastic critical acclaim last year. Her new piece, ''Denise Stoklos Unearths Hamlet in Irati,'' is an autobiographical monologue, based partly on Shakespeare's ''Hamlet'' and set in a small town in southern Brazil. In it, Ms. Stoklos remembers her youth, and from there goes on to reflect on the independence and desegregation of third-world countries. 'Mythos Oedipus' Performances of ''Mythos Oedipus,'' the La Mama founder Ellen Stewart's dance-opera, also begin this evening. Not to be confused with Sophocles, ''Mythos Oedipus'' is based on the actual Greek myth of Oedipus, which Miss Stewart researched while in Athens. Its music was created collaboratively by Genji Ito, Elizabeth Swados, Sheila Dabney, David Sawyer and Michael Sirotta, and is performed by three onstage musicians. ''Though I am not Andrei Serban, this could be thought of as an extension of the Serban-Swados collaboration, 'Fragments of a Greek Trilogy,' '' Miss Stewart said last week. ''We had scheduled time for a piece by the Great Jones Repertory Company, the La Mama resident company of actors and musicians who performed 'Fragments of a Trilogy,' but circumstances prevented Andrei from coming here.'' Miss Stewart created the piece in Greece in a grand outdoor production in which its choreographer, Min Tanaka, also played Oedipus. In that production, among other feats, he climbed a nine-story mountain. ''I'm accustomed to making spectacles,'' said Miss Stewart, whose production of ''Romeo and Juliet'' in Salzburg utilized an entire castle and its grounds. The director's main worry is that the La Mama Annex is too small a space to contain the piece comfortably. Lesbian Tensions If ''Mythos Oedipus'' strains against the boundaries of the theater that houses it, other experimental works around Manhattan are testing different boundaries. Holly Hughes's play ''Dress Suits to Hire,'' at the Interart Theater, an exploration of a volatile lesbian relationship, mixes the brash kinetic poetic symbolism of Sam Shepard's plays with a camp sensibility that looks with amused fondness at the pulpier aspect of pulp fiction. The two-character piece was created by Ms. Hughes in collaboration with Peggy Shaw and Lois Weaver, the actresses who play Deeluxe and Michigan, lovers engaged in a never-ending sexual tug of war. Menace and ambiguity of a different sort permeate ''Symphony of Rats,'' the collaboration between the director Richard Foreman and the Wooster Group, at the Performing Garage. The work offers a grand surreal vision of a future world in which food is created by thought projections and the President of the United States (played by Ron Vawter) receives enigmatic extraterrestrial messages. The sinister images in this avant-garde extravaganza include huge rodent-like puppets whose faces are video monitors on which the director appears. As the cryptic intergalactic communication among the characters continues, a mood of apocalyptic paranoia escalates. In ''Animals,'' at Dance Theater Workshop, the dancer and choreographer Ann Carlson explores the relationship between humans and animals - as pets, symbols, love objects and other metaphors - in work that integrates live animals into performance. In ''Visit Woman Move Cat Cat Cat,'' set to a Beethoven quartet, Ms. Carlson, clad only in underpants, becomes an inquisitive primate on all fours exploring the physical world. ''Scared Goats Faint'' features a gospel choir and live goats, while ''Sarah'' features a duet with a goldfish. As creatively diverse as these innovators may be, there is a wholesome unity of spirit in the avant-garde community. Both Holly Hughes and Ann Carlson, for instance, will put in appearances at P.S. 122's marathon. There lies an intriguing paradox in the fact that even as they test the limits of private visions, many of these artists are willing to share a common ground. A LISTING OF EVENTS P.S. 122 BENEFIT, 150 First Avenue, at Ninth Street. There are four entirely different shows this weekend, each featuring around a dozen acts. They are tonight and tomorrow at 8 and 11. Tickets are $15 a show. Reservations: 477-5288. ''TONY AND TINA'S WEDDING,'' Washington Square Church (135 West Fourth Street) and Carmelita's Restaurant (150 East 14th Street). Performances begin at the church at 2 P.M. tomorrow and Sunday, then move on to the restaurant. Admission is $40, including dinner. Reservations: 279-4200. ''MYTHOS OEDIPUS,'' La Mama, 74A East Fourth Street, Thursdays though Sundays at 7:30 P.M. Tickets are $10 on Thursdays and Sundays, and $12 on Fridays and Saturdays. The box office and ticket charge number for all La Mama events is 475-7710 or 475-7908. Tickets are also available through Ticketmaster at 307-7171. JEFFREY ESSMANN, La Mama, at 10 tonight and tomorrow and at 3 and 10 P.M. on Sunday. Tickets are $10 and $8. ''DENISE STOKLOS UNEARTHS HAMLET IN IRATI,'' La Mama, Thursdays through Sundays at 8 P.M. All tickets are $8. THE KIPPER KIDS, the Kitchen, 512 West 19th Street. Showtimes are 8:30 and 11 tonight and tomorrow; only tickets to the 11 P.M. show, at $8, are available. Reservations: 255-5793. ANN CARLSON, Dance Theater Workshop, 219 West 19th Street, Thursdays through Sundays through Feb. 14. This weekend, showtimes are at 8 tonight and tomorrow and at 3 P.M. on Sunday. Tickets are $10. Reservations: 924-0077. ''DRESS SUITS TO HIRE,'' Interart Theater, 549 West 52d Street, Wednesdays through Saturdays through Feb. 20. Showtimes this weekend are today at 8 P.M. and tomorrow at 6:30 and 9 P.M. Tickets are $10. Reservations: 246-1050. ''SYMPHONY OF RATS,'' Performing Garage, 33 Wooster Street, through Feb. 22, Wednesdays through Sundays. Showtimes this weekend are tonight at 8, tomorrow at 7 and 10 P.M. and Sunday at 8 P.M. Tickets are $15. All shows this weekend are sold out. Reservations: 966-3651. Graphic Photo of avant-garde artists (Dona Ann McAdams (Allen Comic); Paula Court (Ron Vawter); Roy Blakey) (Pp. C1 and C16) End of Document Migratory Spirits The New York Times

Time: 24/03/2005  
In the movie "2001: A Space Odyssey," the director, Stanley Kubrick, made a computer the most human character. Part Aristotle, part English butler, and, in the end, all Captain Queeg, the HAL 9000 computer stood out from his monotonic human counterparts, fascinating not only computer-illiterate filmgoers but also scientists trying to develop artificial intelligence. Unlike other science fiction movies that were careless with scientific fact, "2001" got the details right. The film used the best available science to project a thrilling future within the lifetime of much of its original 1968 viewing audience. The plausibility of the film made HAL itself seem attainable. Moreover, the movie tapped into timeless fears. A breathtaking update of the story of Frankenstein's monster in which the rebellious man-made servant is played by a silken-voiced bit of electronics, the film shows HAL running a spaceship rationally, then apparently acting irrationally and killing all but one of the crew. In the eeriest scene, the survivor disconnects HAL, whose speech becomes slurred and childlike as his higher brain functions are severed. It is little wonder, then, that admirers of "2001" consider yesterday, Jan. 12, 1997, to be important. In the novel "2001," it is the date the science fiction writer Arthur C. Clarke assigns as HAL's birthday, the day it became operational, and admirers of the film take it as a convenient point for measuring hope and dread -- hope that continuing progress in artificial intelligence will lead to vastly more useful computers and dread that someday those computers will do something horrifyingly wrong. Of all the technologies envisioned in the film, only one was a character, an intelligence, something to be reckoned with. But Mr. Kubrick and the work's main author, Mr. Clarke, were optimistic in their scenario. Although a chess-playing supercomputer did defeat the world's best human player last summer and microprocessors leap ahead in performance every year, HAL is nowhere to be found. How much longer should it take before a computer captains a ship to a distant planet, while winning at chess and bantering with its crew? As any computer researcher will confess, a long time. Before scientists can develop artificial intelligence, they must understand the human variety more fully. In the movie, HAL sees, speaks and reasons like a human, (though it is less clear whether it was able to feel emotion). Such functions are not necessarily tied to computer speed and performance. In computer terms, the problem involves software, what the computer does, and not hardware, how fast and efficiently the computer does it. "Artificial intelligence is not like the Apollo moon project," said David G. Stork, a computer scientist. In the 17th century, he added, Isaac Newton solved most of the moon project's deepest scientific problems, "like aiming something at the moon and getting it there." The rest was engineering. "But how do you represent in the mind the structure that is found in the world?" Dr. Stork wondered. "Computer speed is a problem you can throw money at; representation is not. It would take another Darwin to organize into a comprehensive theory of intelligence the little we now know about linguistic, visual and sensory knowledge." Take, for example, the scene in which HAL reads the lips of the astronauts, who have sealed themselves in a soundproof space pod to discuss disconnecting HAL. In an effort to understand human speech better, Dr. Stork, editor of "Hal's Legacy: 2001's Computer as Dream and Reality" (M.I.T. Press), is trying to teach computers how to read lips. He asked a professional lip reader to watch the scene. She could not understand the astronauts' words. Even if HAL could make out most of the astronauts' speech, what algorithm, or precise set of instructions, would tell HAL that it was in danger? Would any programmer, even the most self-hating, write code that instructed a computer -- or permitted the computer to instruct itself -- to note when the words "malfunctioning" and "disconnecting" occur in the same conversation, and then to kill the nearest human being? The mistake that the first researchers in artificial intelligence made was to underestimate the power of the human brain. To defeat the chess champion Garry Kasparov, the computer Deep Blue crunched 200 million chess moves a second to Kasparov's two. But the typical brain can "parallel process" 20 million billion calculations a second, according to Raymond Kurzweil, founder of Kurzweil Applied Intelligence. Parallel processing slices up problems into smaller ones to improve performance. A typical human's prowess, let alone a genius's, might well tax the limits of any computer that can be built. Scientists also overestimated the nimbleness of the computer brain, which today can retrieve information but cannot organize it into systems of knowledge. "The writers of '2001' made the same mistake that artificial intelligence researchers made about intelligent machines -- a mistake that dates from the very beginning" of research on artificial intelligence, wrote Roger C. Schank, a Northwestern University computer scientist, in his essay in Dr. Stork's anthology, "I'm Sorry, Dave, I'm Afraid I Can't Do That." Scientists, Dr. Schank wrote, "assumed that an entity that engages in intelligent actions is, therefore, intelligent." That's why HAL plays chess. The problem, however, is that "the ability to play chess is deceptively complex, whereas the ability to understand English is deceptively simple." Only half in jest, Mr. Clarke has suggested that when a computer cracks a joke, preferably at its own expense, it must be considered intelligent. Dr. Stork goes further, saying the first sentient computer will joke, like the comedian Steven Wright: "You can't have everything. Where would you put it?" Correction An article in Business Day on Monday, comparing future technology predicted in the 1968 film "2001: A Space Odyssey" with real developments since then, misstated the date of the World's Fair at which AT&T demonstrated picturephones. It was in 1964-65, not 1963-64. Correction-Date: January 15, 1997, Wednesday Graphic Photos: Arthur C. Clarke; Stanley Kubrick. Load-Date: January 13, 1997 End of Document Kenneth Colby, 81, Psychiatrist Expert in Artificial Intelligence The New York Times

Time: 25/03/2007  
winter, the satirical comedy troupe that calls itself Artificial Intelligence took over the Ballroom, 253 West 28th Street, to stage an imaginary television variety show called ''Vicki's Valentine Thing.'' Set in 1967, it featured the actress Nancy Cassaro playing a mythical star, loosely modeled after Judy Garland, surrounded by her family and guest stars celebrating ''love'' in a style that might be called Las Vegas hippie. Now the same troupe has returned to the Ballroom with television cameras, microphones and a flashing audience applause sign to present another imaginary variety show featuring many of the same characters. ''A Very Vicki Christmas,'' set two years earlier than the valentine extravaganza, is a savagely funny takeoff of familial television gatherings at holiday time. The format spoofs such silly Christmas show conventions as when famous guests, covered with snow, unexpectedly pop in to visit the star in her living room. At the same time, it allows the audience to witness nasty behind-the-cameras dramas that reach a crescendo of chaos during the commercial breaks that feature actual voice-overs from vintage ads for Pillsbury products and Winston cigarettes. The guests on ''A Very Vicki Christmas'' include a surf music duo named Tracy Everett and Tripp Tyler (Michael Winther and Tony Dowdy) a French mime, Luc-Pierre (Mark Campbell), who comports himself like a fourth-rate Marcel Marceau, and Jack Peters and Donny Palace (James Altuner and Chris Fracciola), whose shenanigans broadly parody Dean Martin and Jerry Lewis. As the perennially tipsy star hostess, Ms. Cassaro, in a platinum wig, slurs her way through travesties of ''The Little Drummer Boy'' and ''When You Wish Upon a Star.'' Although the limited abilities of some of the troupe's 18 members prevent ''A Very Vicki Christmas'' from achieving the perfect mock-realism of a movie like ''This Is Spinal Tap,'' which exemplifies this style of parody, the show, which plays at the Ballroom through Dec. 30, is still funny and endearing in its re-creation of a quaint genre of pop kitsch. End of Document Earbuds That Dance or Not, and Have Artificial Intelligence The New York Times

Time: 10/06/2001  
. . . By David Lodge. 342 pp. New York: Viking. $24.95. "WHAT is structuralism? Is it a good thing or a bad thing?" a professor of English demands, straight-faced, in David Lodge's celebrated 1984 novel, "Small World." Lest you wonder how a man that clueless could be employed in academia anywhere below the North Pole, know that he can boast his job at an obscure agricultural college only because of a fluke. Turns out he's not missing much. The structuralists are buffoons too. Like any good satirist, Lodge is an equal-opportunity deflator of pretensions. "A.I.?" a professor of English queries, unabashed, in Lodge's latest novel, "Thinks. . . ." Her scientist companion dutifully provides an explanation of artificial intelligence, which presumably he wouldn't have to do once the Steven Spielberg film "A.I." comes out this summer. Well, why should she know? She's really just a novelist -- although one has to wonder about a middle-aged, putatively worldly woman who needs to ask, later, "What's a colonoscopy?" She's a respected writer, but it has never occurred to her to communicate by e-mail. However, let us note the year -- 1997 -- so perhaps we can forgive her awe as she watches her future lover set up her modem. She is, no doubt, the kind of woman who would proclaim herself a Luddite, as if she'd invented the notion of using that term for computer illiteracy. In truth, as David Lodge knows very well, academics are never all that hip. "Cutting-edge academic" may actually be an oxymoron. Part of the pleasure of Lodge's academic fiction is the gentle way he targets the smugness and superficiality of intellectuals. His voice is chummy, confiding. He will teach you some things, heckle some orthodoxies, allow some rueful laughter. But he won't utterly rearrange your worldview, nor will he make you feel out-of-the-loop or not-in-on-the-joke, emotions that the people most likely to appreciate Lodge's fiction are least likely to enjoy. Such user-friendliness can, of course, be a liability as well as a strength, threatening to throttle depth. And "Thinks . . ." does aim to be more than a romp. The most ambitious and structurally complex of Lodge's novels, it is sometimes too brisk and cheerful for its own challenging themes. In fact, "Thinks . . ." often feels like one of those 1970's computers, heavy as an air-conditioner, equipped with hieroglyphic software. One of Lodge's characters writes a novel "so old-fashioned in form as to be almost experimental." The opposite might be said of this one: its experimentalism feels almost endearingly quaint. Ralph Messenger directs the Holt Belling Center for Cognitive Science at the University of Gloucester. A jet-setting academic star, he tries to indulge his weakness for women discreetly, so as to avoid alienating his rich, tasteful American wife. The new object of his affection is a visiting professor of creative writing, Helen Reed, who has taken the job in an attempt to control her grief over her husband's untimely death, and maybe even to work through her writer's block. Ralph and Helen could not be more different. Swaggering Ralph scorns the very notion of a soul, convinced that science can understand and codify consciousness. Timid Helen, a lapsed Catholic with vestigial religious yearnings, believes that consciousness belongs to "the province of the arts, especially literature, and most especially the novel." Like any diligent writer, Helen keeps a journal. So does Ralph, after a fashion. He's fooling around with a tape recorder, then voice recognition software, as a quasi-scientific experiment, "to record as accurately as possible the thoughts that are passing through my head at this moment in time." More often than not, he thinks about sex. "Sexual desire," Ralph notes, "that rich intoxicating brew of blood-filled tissue and pheromones and obsession and calculation. . . . It's a puzzler, as Darwin would say." That same phrase from Darwin will appear later in Helen's fiction. We follow Ralph and Helen's affair through their alternating private ruminations. In this game of he said/she said, their views of a given event sometimes dovetail; at other times they diverge. Sometimes, too, an omniscient narrator discreetly appears, to give a more objective view of the proceedings, suave as a BBC voice-over. Lodge has always excelled at smoothly juggling ornate plots. The story here, as in past novels, involves a series of adulteries. (Why not? As Helen notes, "There's not a great deal of narrative mileage in the stable monogamous marriage.") In between knuckle-biting throes of passion, the lovers duel from their respective disciplines, with Messenger (as his wife and lover teasingly address him) and Helen matching wits about evolutionary biology and the nature of the self. Every novelist dreams of composing such an apologia, and Lodge's delight in formulating his is infectious. Luckily -- because Messenger's reputation is as a popularizer of science, and Helen doesn't know anything about his specialty -- Lodge is spared from having to sound too expert. Which is a relief because, although the novel's acknowledgments indicate that he did some serious homework, he's still clearly a student. Unfortunately, Messenger doesn't seem convincingly like a scientist. Except for some laxity in punctuation, his diary sounds pretty much like the one kept by Helen -- who sounds, in turn, very much like the narrator. For a novel built on examining subtle differences in styles of expression and observation, this is a major liability. Helen, Ralph and the narrator tend to speak in stock phrases -- The sex was short but sweet," "He didn't know Martin from Adam." And Lodge too often settles for stating the obvious: "A somewhat anxious business always, for a woman, buying a swimming costume, especially as one gets older. No garment exposes so cruelly the increasing imperfections of the body." We don't need a scientist -- or a novelist -- to unveil that insight. Not surprisingly, the material with the most subtlety and depth belongs to the Henry James-spouting Helen. In a wonderful set piece, she makes a shattering discovery about her dead husband -- through the autobiographical fiction of a student. In another scene, Helen records with relish a revelation about Messenger's wife, aiming for "the 'solidity of specification' that the Master would have approved." The Master would disapprove, however, of the portrait of Ralph Messenger. On the one hand, Messenger is the stock Lodge satyr a la Morris Zapp in "Small World," flip and self-satisfied. But Lodge begins to ask more serious questions about this middle-aged man's ambitions, his feelings about mortality. And since Messenger never rises much above type, it's hard to take his anxieties -- or Helen's passion for him -- much to heart. Lodge resolves the scientist's issues too neatly, assuring us with the old comic irony that it's "always a mistake, to suppose that you know what's going on inside anyone else's head." One of the tantalizing questions Lodge poses is quite an old one: As the world changes, do we? Or do improvements in technology and scientific understanding amount to mere window dressing over the same old souls? No matter how fancy the equipment, is it still plus ca change? Like Helen, Lodge clearly wants "to hold on to the traditional idea of the autonomous individual self." Not a bad plan. Still, it's always a struggle to get autonomous individual selves onto the pages of novels, especially when you have to take time off to write "Science for Dummies." "Thinks . . ." is a dense hodgepodge of farce and darker fare in which Lodge sometimes succeeds in creating engaging, resonant characters. But even when he's off target, it's always interesting and instructive to watch how he aims. http : // www.nytimes.com Graphic Drawing (Boris Kulikov) Load-Date: June 10, 2001 End of Document Artificial Intelligence The New York Times

Time: 13/01/2010  
In ''The Age of Intelligent Machines,'' Mr. Kurzweil valiantly attempts to provide an overview of artificial intelligence - the field devoted to the theory, design and construction of computing machines that think, or at least appear to. He discusses its philosophical, mathematical, psychological and technical roots; the outstanding problems in contemporary research on artificial intelligence; the history and current state of the industry; the impact of artificial intelligence on the arts, and the future of the discipline. The volume is an innovative blend of monograph and anthology, for it includes not only Mr. Kurzweil's own writing but a number of essays by philosophers and researchers in artificial intelligence. This structure would have been more successful, however, if the author had included views divergent from his own alongside those that buttress his position. On his own turf Mr. Kurzweil is clear, current and informative. He understands how artificial intelligence can be used in pattern recognition, reading, speech and music synthesis. But when he strays into philosophy, logic and psychology, he is often sloppy and vague. He relies on dated and secondary sources, ignores or misunderstands many of the most important thinkers and distorts the relevant history of philosophy and logic. Mr. Kurzweil also is too quick to draw inferences about human psychology from artificial intelligence models, and he is superficial when he discusses one of the most exciting developments in current artificial intelligence theory - the emergence of connectionism, which explains intelligence as arising from a web of interconnected, individually very simple, processes. Mr. Kurzweil's enthusiasm for the artificial intelligence industry also leads him to disregard his own advice against overly optimistic projection as well as his own remarks on the deep differences between human and machine intelligence. While noting that ''understanding language can . . . require a knowledge of history, myths, literary allusions and references, and many other categories of shared human experience,'' he says on the same page that Terry Winograd's 1970 Shrdlu program (an early attempt, later repudiated by its designer, to model language comprehension) represents progress toward a genuine understanding of natural language, and he asserts that ''we can expect translating telephones with reasonable levels of performance . . . early in the first decade of the next century.'' There is no suggestion of the mammoth difficulties that confront anyone who tries to accomplish such a task. Chess is a leitmotif in the history of artificial intelligence, and in this book. Mr. Kurzweil writes that ''when a computer does become the chess champion . . . before the end of the century, we will either think more of computers, less of ourselves, or less of chess.'' But then he undermines this odd speculation by observing correctly that the methods by which computers play chess differ dramatically from those by which humans play. This difference is evidenced by the fact that even though humans can play go (a Japanese board game) with no greater difficulty than chess, computers, which can play chess extremely well, are embarrassingly weak at go. In other words, the fact that planes and birds fly makes us think neither more nor less of birds, planes or flight. Bird flight and plane flight are simply two quite different feats. Artificial intelligence raises pressing philosophical and social questions about the concentration of wealth and power, the nature of war, the character of work, personal privacy and what it is to be human. To ignore these is to succumb to what Langdon Winner has aptly called ''technological somnambulism.'' In all fairness, Mr. Kurzweil is aware of some of these issues. ''Computer technology,'' he writes, ''is already a powerful ally of the totalitarian.'' And in another passage, he notes that computer identification technology is ''capable of helping Big Brother track and control individual transactions and movements.'' But none of these issues make Mr. Kurzweil question the unbridled development of this technology. Artificial intelligence boosters and critics are often puzzled by one another, and often talk past one another. Mr. Kurzweil has heard the voices on the other side, but he has not quite understood the force of their arguments or the problems they pose. Even sympathetic critics of artificial intelligence look like Luddites to him. But, after all, judicious Luddism may not be such a bad thing. End of Document John McCarthy, 84, Dies; Computer Design Pioneer The New York Times

Time: 26/07/2009  
What the Upheavals in Artificial Intelligence Research Reveal About How the Mind Really Works. By Jeremy Campbell. 334 pp. New York: Simon & Schuster. $19.95. UNTIL recently the world was more or less divided between those who believed in artificial intelligence and those who considered it a philosophical scam. People were either reductionists, who believed that the brain is a biological machine - a system of neurological gears and pulleys that can be mimicked by a computer - or holists, who insisted that there is some indescribable mind stuff that will slip through the cracks of any simulation. No matter how sophisticated its cogitations, these holists would say, a computer will never have intuition, wisdom or - some have even called it - soul. Like oil and water, the two positions are immiscible; holism and reductionism just don't mix. Lately the mind-machine argument has been muddied by the emergence of a very different kind of computer called a neural network, which Jeremy Campbell, the Washington correspondent of The Evening Standard of London, describes in ''The Improbable Machine: What the Upheavals in Artificial Intelligence Research Reveal About How the Mind Really Works.'' Built from webs of randomly connected electronic neurons, these machines can be trained instead of programmed. As in the brain, the neurons send signals to one another through thousands of adjustable connections, or synapses. As the machine learns, the settings of these volume controls are automatically turned up and down; the chaos of connections evolves into a finely tuned machine, one that can read handwritten letters, for example, or recognize spoken sounds. In the past, a programmer who wanted to make a machine perform such brainlike feats would sit down and try to specify all the rules - and the exceptions and the exceptions to the exceptions - for recognizing, say, the letter a. With a neural net, a trainer simply shows the network a's and other letters, one after the other, and rewards it when it gives the right answer and punishes it when it is wrong. With both artificial intelligence programs and neural networks the goal is to create intelligence outside the body and learn more about how the mind works. But in artificial intelligence it has been assumed that the brain's psychology can be simulated from the top down without paying much attention to the way neurons work. The neural network people take a bottom-up approach: they assemble a network of artificial neurons and hope that a mind will emerge. Like a lot of people, Mr. Campbell is fascinated that neural nets share some of the strengths and weaknesses of human brains. They may occasionally confuse an a and an o, but this fuzziness allows them to recognize a's written in a range of scribbles that would baffle a typical computer program. The neural net enthusiasts are as far from their goal of making intelligent machines as are their competitors in artificial intelligence. But for some reason people who have reviled the artificial intelligentsia, as they like to call them, are suddenly embracing neural networks. The philosopher Hubert Dreyfus has made his career using obscure arguments from Heidegger and other philosophers to denounce artificial intelligence as theoretically impossible. But he was so impressed by neural nets that he rewrote parts of his 1985 book ''Mind Over Machine'' (written with his brother, Stuart Dreyfus), allowing that thinking machinery might not be so unthinkable after all. It is surprising that as good a science writer as Mr. Campbell would fall into this same confusion, believing that neural nets constitute ''an approach that is radically different from much of the Western philosophical tradition.'' His first book, ''Grammatical Man,'' was an exhilarating meditation on information and entropy, order and chaos - the poles of the dynamo that generates life. ''The Improbable Machine'' elegantly describes the importance of neural networks in studying the brain-mind connection. But in trying to make neural nets seem like an upheaval rather than a variation on a theme, he turns artificial intelligence into a caricature that few of its adherents would recognize. Seduced by the pleasures of symbolic logic, he argues, the artificial intelligentsia decided that the brain was like a standard digital computer: step by step, a powerful central processor crunches information as it solves the problems posed by life. Intelligence, these benighted souls believed, consisted of solving syllogisms, and so they set out to program computers to duplicate this purely rational, objective mind. In Mr. Campbell's mythology, the neural net people were clever enough to see through this ruse. Unlike standard digital computers, brains consist of billions of processors - the neurons - that operate in parallel. What is more, people are inherently illogical. We overgeneralize and jump to conclusions. But in our weakness lies our strength. We can tolerate ambiguity and deal with imperfect information. In the 1960's, the neural net researchers were bullied out of the laboratory by the artificial intelligentsia, he argues, but now, two decades later, artificial intelligence has failed and neural nets are making a comeback. The problem with this scenario is that except in the most superficial sense, no one in artificial intelligence ever believed that the brain processed information in the same way as the I.B.M. tabulating your telephone bill. The genius of the prophets of artificial intelligence - people like Alan Turing, John McCarthy, Marvin Minsky and Herbert Simon - was in seeing that despite surface dissimilarities, brains and computers are species of the same genus: information processor. For those trying to understand intelligence, the computer was not a blueprint but an inspiration and a tool, the perfect device for modeling complex systems - the weather, the economy, so why not the mind? True, a few people in artificial intelligence have been preoccupied with using symbolic logic to simulate the mind. But the most interesting work has been in programming computers to exhibit the kind of unpredictable, spontaneous behavior that is anything but rigid and logical. A computer whose chips march to the dictates of digital logic can still be programmed to imitate a paranoid schizophrenic. The psychiatrist Kenneth Colby showed that in the early 1970's with a program called Parry. The artist Harold Cohen's program Aaron, which generates original freehand drawings, stands as a convincing demonstration that something as seemingly indescribable as artistic style can emerge from the interaction of a few hundred simple rules. Each of Aaron's pictures is unique and surprising, yet they are united by a regularity that can only be called Aaronesque. The fundamental idea in artificial intelligence is that brains and computers, like such games as checkers and go, are what mathematicians call formal systems. They consist of tokens - black and red markers, ones and zeros, patterns of neural firings - that are manipulated according to a set of rules. Each token is meaningless by itself. But from the shuffling of empty tokens things like meaning and intelligence arise. IN fact, the neural nets themselves, with all their wonderful properties, are usually simulations run on digital computers. It's clear from his book that Mr. Campbell knows this, so it is baffling that he can approvingly quote the Dreyfus brothers, who seem to believe that neural networks are contributing to the downfall of the idea that the brain is a formal system. Stranger still is Mr. Campbell's contention that the representations inside both brains and artificial neural nets have a quality he calls ''aboutness,'' which the empty symbols of a digital computer supposedly cannot have. Where does this elusive quality go when a neural net is being simulated on a regular old computing machine? Artificial neural networks are formal systems. Deny that brains fall into the same category and you're in danger of becoming a holist, worshipping a ghost in the machine. In trying to figure out how brains make minds, the people who fly the banner of artificial intelligence and those who champion neural networks disagree, sometimes vehemently, about the nature of both the symbols and the rules. But they have much more in common than they and some of their chroniclers seem ready to admit. Graphic Drawing End of Document Jobs Created And Displaced The New York Times

Time: 12/07/2011  
LIFE By Herbert A. Simon. Illustrated. 415 pp. New York: Basic Books. $26.95. As much as any one person, Herbert A. Simon has shaped the intellectual agenda of the human and social sciences in the second half of the 20th century. A brilliant polymath, Mr. Simon is a Nobel laureate in economics, a pioneer in political science, psychology and management and a founding father of artificial intelligence, the enterprise of trying to build machines that think. Now he has turned to autobiography and thus provides a window onto the subjective side of scientific achievement. "Models of My Life," one of the books in the Alfred P. Sloan Foundation series, offers dramatic examples of science as the product of the whole scientist, of the fit among personality, scientific problems and strategies for their solution. As the work comes out of the life, so the life is shaped by the work. And while readers may come to this book thinking that artificial intelligence is an impersonal product of Technological Progress, they will come away seeing that it is a deeply personal enterprise -- an expression of the esthetic of the people who work in it and, more than that, a science of self-reflection, a way of thinking about one's own thought. Herbert Simon was born into a middle-class German immigrant family in Milwaukee in 1916. From his earliest years, and notably from the days of his first algebra course in high school, he had a strong love of order. He was, for instance, "troubled by the fact that some quadratic equations had two solutions, some had one, and some none." Referring to his young self in the third person as "the boy," Mr. Simon comments that the intensity of the boy's feelings "seemed to reveal something of a Platonist within him, a desire to find pattern, and preferably simple pattern, in the world around him." He recalls that during his undergraduate years at the University of Chicago, in the early 1930's, a period of intense intellectual and political ferment, he argued philosophy with friends who were loyal to an unruly "Aristotelian-Thomist-Catholic-Trotskyism." But his own tastes led him to less esoteric intellectual seas. A political scientist by training, Mr. Simon studied decision making within organizations and used his findings to lay the foundation for a critique of neoclassical economic theory. Mr. Simon developed a vision of rationalism adapted to 20th-century sensibilities. Neoclassical theory, he believed, had turned such abstract goals as what economists call "optimization" and "maximization" into fundamental laws of human behavior, and it had foundered, as he thought any inquiry into ultimate meaning would, on a preoccupation with absolutes. In his view, people who behave rationally are not optimizing anything at all; they are simply making decisions based on what their environment tells them they can and cannot do. People don't strive for the best, he maintained, they look for what is possible within the bounds of their given situation. Instead of satisfying desires, said Mr. Simon, human beings "satisfice," they search "for 'good enough' actions rather than optimal ones." Mr. Simon tells us that this idea of "bounded rationality" has been his "lodestar for nearly fifty years." As he sees it, people torment themselves when they ask too-big questions about their ultimate desires. He believes the proper procedure is to determine the boundaries in which rationality can most constructively operate and then to keep one's sights within them. Such theoretical beliefs allow Mr. Simon to have a relatively untroubled eye. "Searching for the best can only dissipate scarce cognitive resources," he writes. Borrowing Voltaire's aphorism, he says that in science as in life, "the best is enemy of the good." In the mid-1950's, Mr. Simon married his vision of human behavior to the possibilities offered by computer technology. The computer gave powerful expression to Mr. Simon's already-formed intellectual esthetic. His idea that humans solve problems under constraint was easily adapted to the task of programming a computer to solve problems using heuristic search -- a procedure that doesn't involve absolute rules but rules of thumb based on the knowledge of specific and bounded environments. And his idea that observation must be the foundation for abstraction led him to create a research strategy for artificial intelligence that he called "thinking aloud." In "thinking aloud," Mr. Simon and his colleagues asked people to express their thoughts as they solved logical problems, and then they analyzed the transcripts of these sessions. The protocols of human beings playing games and solving puzzles were used to evaluate computer programs made to follow in human footsteps. Whereas some artificial intelligence researchers were content to leave aside the larger question of whether machines that perform intelligent tasks are doing them in the way people might, Mr. Simon took a very different tack. His artificial intelligence was psychology, not engineering. From the first, he says, "we were interested in simulating human problem solving, and not simply in demonstrating how computers could solve hard problems." His school of artificial intelligence was committed to the view that human intelligence is the manipulation of symbols and the implementation of rules. "For my money," he writes, "to show that something whose behavior looks very complex and erratic is really built from the combinatorics of very simple components is beautiful, not demeaning." What Mr. Simon saw as self-evident, others found controversial. His critics questioned whether he had really demonstrated that people solve problems the way his programs did, and challenged the premise that a rule-based theory could explain the complexity of human behavior. In artificial intelligence, technical and philosophical arguments commingle. So, in addition to contributing to artificial intelligence as a scientific discipline, Mr. Simon became a chief spokesman for a view of the field as a revolutionary and salutary break with past limitations in philosophy and psychology. In Mr. Simon's opinion, the computer offered the 20th century a solution to the mind-body problem -- "how a physical system can have thoughts." He believed that if one put aside the too-literal analogies between the neurological organization of the brain and the wiring of the computer, there was a "more fruitful analogy": people and computers could be shown to process information and manipulate symbols in the same way. In December 1955, Mr. Simon and his colleague, the artificial intelligence scientist Allen Newell, succeeded in writing a computer program that could prove mathematical theorems. Mr. Simon celebrated the achievement by walking into class in January and announcing to his students, "Over the Christmas holiday, Al Newell and I invented a thinking machine." To the rest of the world, he was no less enthusiastic or unequivocal. In a letter to Bertrand Russell written the following October, Mr. Simon stressed that when the thinking machine had proved theorems from Russell and Alfred North Whitehead's "Principia Mathematica," the solutions had involved "genuine 'discovery.' " (To this missive Russell replied: "Thank you. . . . I am delighted to know that 'Principia Mathematica' can now be done by machinery. I wish Whitehead and I had known of this possibility before we both wasted ten years doing it by hand.") In a much-cited 1957 paper, Mr. Simon predicted that in 10 years "a digital computer will be the world's chess champion, unless the rules bar it from competition," and that after chess the possibilities were endless. Within the "visible future," Mr. Simon declared, "machines that think, that learn, and that create" will be able to handle the range of problems "coextensive with the range to which the human mind has been applied." Things have not worked out as straightforwardly as Mr. Simon expected. A digital computer is not yet the world's chess champion, and it has turned out that it is easier to teach computers to solve logical problems than to recognize everyday objects, easier to make them play chess than make mud pies. These disappointments have led some critics to claim that there are absolute limits on what computers can do and other critics to say that no matter what computers accomplish they will only be simulating thought. The field has sparked an impassioned and continuing debate about the qualities that might make people different from "thinking machines" in fundamental and unbridgeable ways. In "Models of My Life," however, Mr. Simon barely acknowledges the four decades of controversy in which he and artificial intelligence have been engaged. He interprets and dismisses most of it as romantic resistance. "I think those who object to my characterizing man as simple want somehow to retain a deep mystery at his core," he writes. "In arguing that machines think, we are in the same fix as Darwin when he argued that man shares common ancestors with monkeys, or Galileo when he argued that the Earth spins on its axis." Mr. Simon does not make his large claims and predictions in a spirit of hyperbole; in his eyes, modeling elements of human logical capacities in machines is the same as creating intelligence. His simplification of the scientific path ahead and his impatience with skeptics have always been in the service of starting and protecting a new discipline. He sees himself as a pioneer, inventor and missionary, whose job is to present artificial intelligence in as sharp and clear a form as possible. The task of recognizing limitations and pronouncing caveats is better left to others. His role was to announce a scientific revolution and declare it ready to set up provisional governments in all the human and social sciences. One can hardly imagine a better fit between a man and his intellectual enterprise. Artificial intelligence is the expression of Herbert Simon the economist and Herbert Simon the man. He used thinking about his own thinking and strong personal convictions about bounded rationality to create the general shape of his theory. Conversely, when he contemplates his life he uses concepts drawn from his vision of the field. In "Models of My Life," artificial intelligence appears not only as a technical discipline but also, like psychoanalysis, as a structure for self-reflection. Through its lens, Mr. Simon sees his life in terms of choices, branch points in a maze, searches and decisions. But there are no demons. Mr. Simon describes his life as a "maze without a Minotaur." Indeed, in 1970, he sought out Jorge Luis Borges in Argentina to discuss their shared metaphor of the labyrinth. For Mr. Simon, the search for patterns and rules goes beyond intellectual matters; he looks to it to provide him with a moral metric and a set of values for living. In his autobiography, he explores the meaning of intimate experiences through the formal propositions that might hold them together. Thus, he seems disappointed that Borges denied there was an abstract model underlying his mazes. In Mr. Simon's hands, even the most emotionally charged events become occasions to discover rules and defend theorems. For instance, he describes an episode during which he contemplated infidelity with an attractive former student he calls Karen. He begins by saying that he "cannot deny" the proposition that one might be "genuinely in love with two women at once" and then shows how he used his experience to add an important new corollary to his theory of love: "You can love two or more women at once . . . but you cannot be loyal to more than one." In his account, Mr. Simon casts his wife in the role of dialogue partner for himself and Karen as they all agree that he was "asking for the moon," attempting the logically impossible. The consistency of Mr. Simon's scientific and personal esthetic, the penchant for the propositional, will surely draw fire from those with Freudian sensibilities who will be alienated by his search for simple rules in complicated situations and his tendency to close down potentially discomforting questions. When, in 1965, Mr. Simon visited the school in Darmstadt, Germany, where his father had studied engineering, he was faced with questions about his father's real reasons for immigrating to America. Before leaving Germany, in 1903, his father had challenged a fellow student to a duel because of what Mr. Simon believes was an anti-Semitic comment. What, asks Mr. Simon, was his father's relationship to his Jewishness? What, wonders the reader, is Mr. Simon's own relationship to these elements of his past? But such questions are dismissed as irrelevant. They will not yield up facts: "Nothing we could now seek out in Darmstadt would reveal the secret of that student quarrel." And the feelings they would bring up would only be unhelpful: "The mists perform an important social function when they place a statute of limitations on man's memory of ancient wrongs." The information-processing lens, like all theories of mind, is selective in what it places in the foreground and leaves in the background. It consistently leads Mr. Simon to see facts as more important than feelings and to see logic taking precedence over all. His lodestar principle of bounded rationality makes him comfortable with a situation in which there is little room for considering those things an information-processing model leaves out. He is comfortable with the mists that hide the Minotaur. In focusing on the maze, he falls squarely on one side of a division in the long history of thinking about human nature -- on the side that sees people as rational animals and rationalism as the source of a happy life. If deviation from rationalism is what gets us into trouble, let's be rational. If memory is painful, let's forget. Of course, there has always been another approach -- to put oneself in touch with memory and Minotaurs. In this view, dreams of rational progress founder on the shoals of fantasy, passion and irrationality. In choosing a life as well as a science of simple propositions, patterns and principles, Mr. Simon is certainly a pre-Freudian, one who does not recognize a seamless web between rational and irrational. But the more important issue raised by this book is that Mr. Simon and his computational esthetic may be the harbingers of a post-Freudian world view. For many readers, Mr. Simon's view of human endeavor, of love and of work, will seem emblematic not of the pre-Freudian rationalism-that- was but of a new, sleeker rationalism-to-be -- a rationalism purged of utopian excess, committed to empirical studies and wedded to the most modern technology. "Models of My Life" challenges us to think carefully about the costs as well as the benefits of this new rationalism, by suggesting that it may blind us to the Minotaurs in our mazes. And since the parents of scientific revolutions are often more effective if they gaze on their progeny with untroubled eyes, Mr. Simon's book challenges us to do what he has not. 'I DON'T FEEL LIKE I'M IN A MAZE' If there is one thing holding together Herbert A. Simon's work in economics, artificial intelligence and psychology, it is the idea that making decisions is like going through a maze. But even he acknowledged that the maze metaphor can be confining. After all, "one doesn't spend most of one's time making decisions. One lives. I don't feel like I'm in a maze," he said during a telephone interview from the University of Minnesota in Minneapolis, where he was attending a conference on cognitive psychology. "The choices we make lead up to actual experiences. It is one thing to decide to climb a mountain. It is quite another to be on top of it." Mr. Simon said that "any model of human behavior that focuses on decision making gives us an overrational idea of humans. Artificial intelligence is only a model of human choice, not of human emotion." So, while a computer program can simulate what human beings are doing when they're making decisions, "no one has ever tried to model, say, two people married to each other." Why focus on the rational rather than on the emotional? That choice, Mr. Simon said, "may be a commentary on my personality. Being reasonable, if not rational, is very important to me." His decision to write his autobiography, "Models of My Life," was one of his eminently reasonable decisions. Mr. Simon, a professor of computer science and psychology at Carnegie-Mellon University, said he began to reminisce about his life when Pamela McCorduck interviewed him for her book "Machines Who Think." As he recalled, "she said she wanted to do a biography of me, but then she found something more interesting to do." So Mr. Simon wrote it himself, thinking, as he does about many things in his life, that it was for the best. After all, he said, "I have access to some sources that no one else has." Mr. Simon said that the experience of writing an autobiography hasn't changed his thinking about thinking and that history hasn't changed his thinking about thinking computers. Though his prediction that a computer would be the world's chess champion by 1967 did not come true, he said, "I still feel good about my prediction. Only the time frame was a bit short." -- SARAH BOXER Graphic Photo: Herbert A. Simon (Basic Books) (pg. 29) Load-Date: March 17, 1991 End of Document The First Church of Robotics - Correction Appended The New York Times

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to her resume, the fictitious Miss Vicki Oberjeune became a movie star as a child - ''many moons ago'' - in ''X Marks the Spot,'' a tap-dancing musical comedy about ''a young teen-ager and her love for her dog, Spot.'' Soon to be married for the seventh time, the 34-year-old ''Miss O,'' as she is called, ''blossomed into television work,'' first in a short-lived series, ''The Unreachables'' (a female version of ''The Untouchables''); then with her own talk show, ''Cocktails With Miss O,'' in which she ''chatted with every guest imaginable.'' The creator of ''Miss O'' - and the writer of her resume - is Nancy Cassaro, a 27-year-old performer from Massapequa. The live musical comedy revue, ''The Vicki Oberjeune Valentine's Day Special,'' is a one-hour sendup of 1950's and 1960's-style television party/family/at home/hit-parade-type shows. It was conceived and co-written by Miss Cassaro and is being performed by Artificial Intelligence, an 18-member comedy theater troupe, of which she is a founding member. Artificial Intelligence took up residence as one of four comedy attractions at a Manhattan cabaret restaurant, the Ballroom, 253 West 28th Street, during a monthlong comedy festival that ended yesterday. Because of enthusiastic critical and audience response, Miss Cassaro -who plays Miss Oberjeune - and company will return to the Ballroom from Tuesday through Feb. 14, playing Tuesdays through Saturdays at 9 P.M., in the retitled revue, ''Vicki's Valentine Thing.'' In performance, Miss Cassaro's comedic beginnings can be traced to the revue ''Gold Diggers of '73,'' which she also wrote, in the eighth grade while attending J. Lewis Ames Junior High School in Massapequa. Then, as now, much of her material was inspired - or thrust upon her - by family experiences. ''When your brothers tease you and your sister drives you crazy with a dopey song, you have to develop a sense of humor,'' she said. The song with which her sister, Alice, now a music teacher in Massapequa, taunted her - ''Bluesette,'' with its simplistic lyric ''Poor little bluesette/Sad little bluesette/Don't you cry/Don't you fret'' is one of the intentionally insipid numbers in the Vicki Oberjeune show. And ''Little Sister Syndrome,'' an account of growing up with five siblings, was one of Miss Cassaro's made-up songs when she appeared as a standup comedian in an East Village club in Manhattan in 1982, after she graduated from Hofstra University and worked as a waitress in a Hicksville restaurant for one year. Miss Cassaro's family includes her parents, three brothers, two sisters -as Vicki, she wears her older sister Judy's old dresses - ''and 10 nieces and nephews, with one on the way,'' she added, counting names on her fingers. They live in various parts of the Island: ''Commack, Garden City, Seaford,'' she said, again counting. Her father, Dr. James Cassaro, has been practicing medicine in Massapequa for 35 years. Apart from family influences, Miss Cassaro has had her theatrical mentors: Hofstra University's Dr. Richard Mason, with whom she studied environmental theater, and, after graduating, David Kaplan, a teacher and director in New York, who emphasized the techniques of episodic theater. Thus, her orientation toward comedy is rooted in character and context. With a group of Mr. Kaplan's students, she formed Artificial Intelligence in 1985. Rather than set routines or sketches, the company chooses to create an event and elaborate upon it in terms of a whole environmental theater piece, in which rituals are satirized, with a tone ranging from nostalgia to savagery. For its first show, Artificial Intelligence staged a wedding party. Titled ''Tina-n-Tony,'' it has been performed in a SoHo loft and a Greenwich Village church and has evolved into a screenplay, ''Tony-n-Tina Forever,'' which is about a wedding in Massapequa. And just as Vicki has her resume, Tina has a wedding album, replete with such photos as the bride and bridegroom covered with dollar bills, which they charged their guests to dance with them. The environment for the Vicki Oberjeune revue is a television studio, an idea that, Miss Cassaro recalled, came while ''looking through a picture book by Desi Arnaz.'' ''There was the 'I Love Lucy' set,'' she said, ''then suddenly another picture showed the crew and then the audience, and the perspective of the Ricardos in their living room changed. It was a whole fake world, and I thought, 'So, that's really what's going on!' '' From there, Miss Cassaro's fancy, and that of her co-author and director, Larry Pellegrini - took flight. One character, Fritz Freund, is named after Karl Freund, who was the actual cameraman on the ''I Love Lucy'' shows. Another character, Jack Peters - played by James Altuner - is intended to be a satirical cross between the singers Jack Jones and Robert Goulet. The Vicki Oberjeune revue begins with the crew setting the stage for a television show. An ''applause'' sign lights up, getting the live audience prepared to act as a television audience. The frenetic goings-on include a tipsy star (''the incomparable Vicki'') teetering about, making off-camera advances to the cameraman (her next husband), competing for on-camera attention with her sultry daughter and singing a love ballad to her innocent son. The singers and dancers are forever out of step, out of tune and out of synch. The result is sheer madness. Explaining the Artificial Intelligence comic style and credo, Miss Cassaro said: ''We create the contradistinction between what they're doing for the camera and what they're really doing - like maybe they're hitting each other. When we thought up our name, we hoped to be taken seriously - but we never want to take ourselves too seriously. We're just a bunch of writers and actors with a sense of how absurd things are. ''We like creating a theatrically entertaining world and asking the audience to come into it. Maybe we can give people a different way of looking at television shows and weddings.'' Graphic Photo of James Altuner with Nancy Cassaro in ''The Vicki Oberjeune Valentine's Day Special'' End of Document New Search Tool Aims at Answering Tough Queries, but Not at Taking On Google The New York Times

Time: 06/01/2013  
Washington State's Evergreen State College in Olympia appears to have taken academic silliness to a whole new level: It is offering a course on "Star Trek" that is the only class students are required to take for two full semesters, the term just ended and the one now beginning. The college maintains that "Star Trek" has been an important part of American popular culture for more than a quarter of a century, and offers sophisticated lessons in fields from cognitive psychology to quantum physics to movie script-writing. Fifty-two students, mostly sophomores and juniors, signed up for the two-quarter course, which involves 17 hours of classes a week. Four students had never seen the series, and two hated it. The school newspaper made unmerciful fun of it at first, but that has stopped. Evergreen's approach is to take a theme and use it as a basis for interdisciplinary study, taught by teams. Teaching "Star Trek" involves weekly science lectures in such topics as Newton's law of gravitation, as well as electromagetism and light. A rocket scientist from nearby Boeing spoke on the history of the space program. A scientist involved in the search for extra-terrestrial intelligence was a natural. Dr. Carrie Margolin, one of the course organizers, is a cognitive psychologist who uses the series as a pretext to examine issues of artificial intelligence, her specialty. "They're studying artificial intelligence," she insisted. "They're not studying 'Star Trek.' " A science professor in the course analyzes early episodes of "Star Trek" to see if the science they were based on has changed. In the media studies segment, students learn how to read a film as text, searching for hidden elements. In literature, they read science fiction novels. Each writes a script for an imaginary "Star Trek" episode. Dr. Margolin argues the show also imparts good values, particularly on such thorny subjects as race relations. "It's a very optimisteic TV show," she said. Timothy L. Wilson, a student in the course, said he has always been a "Star Trek" fan. "But I thought it would also be a good theme for learning about the world I live in and whatever else is out there," he said. "It hasn't been a real piece of cake." Beam me up, Scotty. Graphic Drawing Load-Date: January 8, 1995 End of Document Computers Jump to the Head of the Class The New York Times

Time: 05/07/2001  
David Lodge regards his fiction as "a kind of DNA of the imagination." As he said in a recent interview, "There must be a signature in everything you do, a family resemblance." He was in his London pied-a-terre, having come from his home in Birmingham, England. "The same preoccupations come up in whatever form you use, but I do like to vary the form," he added. For him, each novel has to have a new playing field and angle of vision. In his comedies of manners ("Changing Places," "Small World," "Nice Work"), Mr. Lodge has proven himself to be a one-man master class of novelists, often writing about academics and writers and the philistines with whom they inevitably collide. He said that the older he got -- he is now 66 -- "the more you become aware of the structure of your imagination." "I tend to think in binary oppositions," he said, a quality exemplified by "Nice Work." In that book Robyn Penrose, a post-structuralist critic and teacher, encounters a vulgarian titan of industry. Despite their differences, she and he eventually fall in love. With his new novel, "Thinks . . ." (Viking), he broadens his syllabus to include science as well as art. In it he raises questions about human consciousness and artificial intelligence, while also keeping one foot in academia, the territory he knows so well. The polarities are represented by Ralph Messenger, a cognitive scientist and lady-killer, and Helen Reed, a novelist and teacher of creative writing. Although Mr. Lodge denies that he has any real-life prototypes for his characters, imagine a technocratic Ted Hughes in a secret romance with a newcomer to the faculty of a provincial university. This time Mr. Lodge's form is a computerized variation on the epistolary. In alternating chapters, the principal characters offer accounts of their lives and loves, with Ralph recording his rambling monologues on voice-recognition software and Helen typing hers neatly on a laptop. Crosscut, the chapters are like the text in those balloons over the heads of characters in comic strips, the ones relating inner thoughts rather than public discourse. As Ralph says, "We never know for certain what another person is really thinking," unless, of course, a novelist like Mr. Lodge is telling the story. Teasingly, Ralph suggests that he and Helen exchange diaries. Naturally, the reticent Helen refuses. As Mr. Lodge probes the couple's cognitive conflicts -- his belief in the power of science, her faith in the power of the mind -- the novel becomes a tantalizing philosophical debate. "Perhaps the most ambitious novel of the author's sunny career," Joyce Carol Oates said in a review in The Times Literary Supplement. The word sunny was carefully chosen. As with Mr. Lodge's other books, "Thinks . . ." is on one level a droll, irreverent exploration of sexual and educational shenanigans on a university campus. The idea for the novel came after Mr. Lodge read an article by John Cornwell about two scholarly books that demonstrated that scientists were becoming very interested in consciousness, a subject previously thought unsuitable for their investigation. Mr. Lodge's primary adviser was Aaron Sloman, professor of artificial intelligence and cognitive science at the University of Birmingham, where Mr. Lodge taught for many years until his retirement. His previous novels about academia took place at the fictitious Rummidge University, a stand-in for Birmingham. After he assured Mr. Sloman that the new book would not be set at Rummidge but at the equally fictitious University of Gloucester, this professor agreed to cooperate as his "chief mole in the world of artificial intelligence," Mr. Lodge said. He was quick to add that Mr. Sloman was happily married and "the ultimate antithesis of Ralph as a human being." Immersing himself in science, Mr. Lodge went to conferences on consciousness, where he noted a striking difference between them and the literary ones he spoofs in his novels. He said that "every speaker at a science conference has a visual display of some kind, typically a set of slides," and generally improvises his talk. In contrast, academics and humanists write papers and read them, often boringly, without any visual accompaniment. Academics are also more interested in partying, as evidenced in other Lodge novels. In what he calls "a shift toward the dialogic," Mr. Lodge was able to scrutinize two cultures. Although, as a novelist, his natural sympathies are with Helen, he can also see validity in Ralph's stance. He said he did not write the book "as a polemic against either artificial intelligence or neurobiology." To keep the match even, Helen makes many insightful remarks, including her observation that because of the specialized knowledge contained in a computer, it could be regarded as the equivalent of the idiot savant. Illustrating the point, Mr. Lodge quoted one unnamed scientist: "We can design a robot that will be a champion chess player, but we can't design one that will come in out of the rain." Partly because he was untrained in science, Mr. Lodge found the book difficult to write. It is his 11th novel and the first since "Therapy" in 1995, although between the two he wrote the play "Home Truths" and later turned it into a novella. He also wrote screenplays of his last two novels, as yet unproduced. In recent years his novels have become popular in countries other than Britain. France, in particular, has a great affinity for his work. Because the title of the new book would be meaningless in French, he has been trying to think of an alternative. He realized that the French word for consciousness is the same as its word for conscience: conscience. The French title may become "Matters of Conscience." Savoring the double meaning, he said, "That's very much what the novel is about." Occasionally, Mr. Lodge still writes criticism, but fiction is his major preoccupation. "Though I play games with novels," he said, "basically I'm in the English realist tradition. In order to create characters, I have to imagine histories for them, which are consistent eternally and also with real history." Sometimes the same characters have appeared in several books. Robyn Penrose from "Nice Work," for example, has a cameo in "Thinks . . ." Mr. Lodge always tries to find "a precursor text," a book or myth that can give thematic heft to a novel. With "Small World," it was King Arthur and the search for the Holy Grail, and with "Therapy," it was Kierkegaard's work. The inspiration for "Thinks . . ." came from Henry James, particularly "The Wings of the Dove" and "The Golden Bowl." "Both of them are about deception, sexual deception," he said. In "Thinks . . .," he explained, "infidelity is the main motor of the narrative." To underscore the connection, Helen is an expert on James. Because of James's authorial control of his characters, she considers him to be a classic example of how a novelist represents consciousness. Ralph cavalierly dismisses that approach as affectation. Mr. Lodge artfully strews his book with literary references, parodying James as well as Samuel Beckett, Salman Rushdie, Martin Amis and Fay Weldon -- and challenging the reader's gamesmanship. Suddenly the buzzer sounded on his apartment intercom. It was a photographer coming to take his picture. Asked what he was thinking about at that moment, Mr. Lodge told a story: "There's a famous picture of James Joyce being photographed. He's looking at the camera. Somebody said to him, 'What were you thinking when that picture was taken?' He said, 'I was thinking, would this photographer lend me five shillings?' " http : // www.nytimes.com Graphic Photo: David Lodge, the British author, who has published his 11th novel, "Thinks. . . ." (Jonathan Player for The New York Times) Load-Date: July 5, 2001 End of Document Joseph Weizenbaum Dies; Computer Pioneer Was 85 The New York Times

Time: 17/03/2012  
the Ballroom, a staid restaurant-cabaret in Chelsea, recently decided to present comedy as well as music on a regular basis, a brilliant, virtually unknown 18-member troupe of satirists calling themselves Artificial Intelligence stole the show at the club's opening-night marathon. Impersonating a film crew from the fictitious Beacon network and swarming through the club with video equipment, the troupe turned the Ballroom into a make-believe television studio, where it ''filmed'' (though no film was actually rolling) a 1967 variety show entitled ''Vicki's Valentine Thing.'' The 65-minute show, which the Ballroom is presenting on Tuesdays through Saturdays until Feb. 14, is the hilarious comedy-theater equivalent of the sorely missed ''SCTV'' series and of Rob Reiner's rock documentary spoof, ''This Is Spinal Tap.'' It distills with deadpan accuracy the essence of the tacky thematic variety specials that proliferated on prime time during the 60's. Even more, it captures the mood of television -and of American popular culture - at the precise moment when flowery Mod fashions and slogans of peace and love were just beginning to invade the mass media and to commingle with entrenched show-business glitz. At the center of a show in which every character, right down to the last technician, has a fictitious personal history is its star, Vicki Oberjeune (Nancy Cassaro), a tipsy, pill-popping singer-actress in her late 30's who is attended by her sixth husband, Mickey Styles (Jack Fris); her two children, Gina Anthony (Monica Horan) and Nicholas Frank (Eli Ganias), and a backup group called Tracey and the Truth, led by Gina's boyfriend. The audience, which is encouraged to participate with an applause sign, gets to glimpse two worlds - the heartwarming scenes of familial togetherness enacted before the camera and the frantic, behind-the-scenes chaos in which everyone's personal life, and indeed the show itself, is on the verge of collapse. But the show does go on. And among other tarnished pop nuggets, it resurrects such vintage musical fare as ''A Man and a Woman,'' ''The Look of Love,'' and ''The Rain, the Park, and Other Things,'' all performed with period 60's television-style arrangements. In one uproarious dance number, a peace symbol is hoisted to the top of a maypole as the cast whirls giddily to the strains of ''Love Potion No. 9.'' A more solemn note is struck when the representative of a historical society arrives to display one of the world's oldest valentines onto which the drunken star accidentally empties her drink. Young and Brash Like the members of the ''SCTV'' troupe and the original cast of ''Saturday Night Live'' in the mid-70's, the members of Artificial Intelligence are young and brash. Ms. Cassaro, who conceived the show, is only 27 years old. She and most of her cohorts were in early grade school when ''flower power'' swept the media. Today, along with several other members of the troupe, she works in advertising, as a talent coordinator for Batten Barton Durstine & Osborn. ''Nowadays, I don't watch a lot of TV, but when I was younger I used to live in front of the set,'' she recalled the other day. ''To research this show, I studied a lot of old variety programs at the Museum of Broadcasting. It's amazing to realize that people actually watched programs like that and thought it was real. The character of Vicki is a hybrid of Judy Garland and Peggy Lee with a little Connie Stevens. I'm not trying to denigrate the character. I really respect that image and what it meant to the American public 20 years ago.'' Ms. Cassaro, who grew up in Massapequa, L.I., and majored in drama at Hofstra University, was particularly inspired by a class in theater styles where she learned about ''environmental theater,'' and the work of Julian Beck and Joseph Chaikin. After moving to New York City four years ago, she met the core of the group that became Artificial Intelligence in classes taught by the director David Kaplan. ''David's philosophy is that there's nothing you can't do - the wilder you are the better,'' Ms. Cassaro said. ''We were tired of going to auditions and so we formed a group and began performing our own material in East Village clubs. Our first major piece, 'Tony 'n' Tina's Wedding,' was a full-scale Italian wedding that involved 23 actors and 80 invited guests. The piece was performed twice, the second time in an actual church, with the reception in an American Legion hall. The details extended to sending out engraved invitations and having special matches made.'' Cost Just $1,500 to Produce ''Vicki's Valentine Thing,'' which cost only $1,500 to produce, evolved out of a 1965 Christmas show that the troupe created for the same character. Its director, Larry Pellegrini, an aspiring writer of plays and musicals, works as the booking agent for Jason's Park Royal, an Upper West Side cabaret where the troupe once appeared. ''Nancy called me last August and asked if I would direct the Christmas special,'' Mr. Pellegrini said the other day. ''She put together the cast, and we met at my apartment, where we rehearsed the whole thing. Everybody came in character and stayed in character. Even though Vicki Oberjeune hates the director, it was actually easier dealing with everybody as their character than as themselves.'' Artificial Intelligence has a growing list of possible future projects. One is a ''Reincarnival,'' a holistic health fair with booths, bands and performance groups, which they would like to do at the Central Park Band Shell during the summer. Another is a 24-hour telethon. A third, which may be presented in the spring, is a company picnic followed by a wake the day after one of the revelers dies of a heart attack. ''In everything we do, whether it's a wedding, a TV show or a wake, we invite the audience to re-examine the ritual,'' Ms. Cassaro said. ''Because they know it's theater, they get a different perspective on it. We never want an audience to feel threatened. We create a world first and then invite other people to come and play in it.'' The Ballroom is at 253 West 28th Street. Show time for all performances is at 9 P.M. There is a $15 cover charge and a two-drink minimum. Information and reservations: 244-3005. Graphic Photo of Nancy Cassaro (Swope Associates/Linda Alaniz) End of Document Look Officer, No Hands: Google Car Drives Itself The New York Times

Time: 12/03/2003  
"Now how many people must get killed?" begins the latest antiwar refrain from the pop world. "For oil families' pockets to get filled?" The song is "In a World Gone Mad," which was released yesterday with no advance fanfare by the Beastie Boys. Though not commercially available as a single, the song is available free at the Beastie Boys Web site (www.beastieboys.com) and is being distributed to disc jockeys, who were unaware of it until they began receiving copies yesterday. "We were working on our record, and we realized that by the time we finished a record that it might be a bit late to get out some of the things we wanted to comment on," said Adam Yauch of the Beastie Boys, speaking by telephone yesterday. "So we figured we'd finish the song and post it." The single is also meant to serve as more than a protest song. The band said that it wanted to send a message to the rest of the world that not every American backed the foreign policy of the current administration. "I think a big part of wanting to do the song was just hearing Bush make these speeches, seeing how the rest of the world was reacting to it, and feeling like Bush doesn't represent us," Mr. Yauch said. "One of the purposes is to let people in other parts of the world know that the messages he's sending out aren't necessarily the view of all Americans. And it's also to say to people in the United States who might be uncomfortable protesting that it's all right to do that. One thing that the U.S. administration has been trying to do is give the feeling that it's un-American to protest." Though the song has a similar title to the Beenie Man reggae song "World Gone Mad," which laments social conditions and asks the president for an explanation, the Beastie Boys said they were unaware of the other song. Their song mixes lyrics advocating nonviolence and multilateral disarmament with the band's sense of whimsy. Thus a deep thought is followed immediately by a rhyme like "They're layin' on the syrup thick/We ain't waffles, we ain't havin' it." "Part of music is being able to enjoy yourself, too," Mr. Yauch said. "Some of the most powerful commentary that there's been on the Bush administration has been Will Farrell on 'Saturday Night Live.' It's goofing around, but it has a huge impact." Computer Hits When a news release arrived announcing that a company in Barcelona, Spain, had developed an artificial intelligence application that could analyze a song and determine its potential to become a hit, it seemed to be a practical joke poking fun at the desperation and cluelessness of the music business. But I regret to inform you that further research has determined that not only does this company, Polyphonic HMI, seem to exist, but there are already several major labels -- Sony Music, RCA, and Universal UK -- that are either using it or considering the option. Among its advocates is Muff Winwood, the former Spencer Davis Group bassist who is now an executive at Sony. Tracie Reed, the vice president of the North American office of Polyphonic, said that the application, called Hit Song Science, was originally developed by Grupo AIA, a Spanish artificial-intelligence company. It analyzes the melody, beat, harmony, pitch, octave, timbre and other patterns in songs, and plots them on a chart that Ms. Reed said looked something like the Milky Way. Songs with similar elements tended to group together in clusters, she said. One original idea for its use was to offer CD shoppers recommendations based on their favorite songs. But when executives at the company loaded every song in the Billboard Top 30 over the last five years into the program, they discovered that "lo and behold, they all had something in common," Ms. Reed said. What that something is, she added, is something that human beings cannot quite name but computer programs can recognize. When the company discovered this, it decided to offer record labels the chance to compare unreleased songs to recent hit singles to determine their commercial viability. Ms. Reed said the company had already been paid to analyze unreleased songs by several major labels. She also said the company was offering a similar service to studios, so producers could get feedback on songs they were working on. "We think that Hit Song Science helps raise the bar for music," she said. "We empathize with the people who buy a CD and only like two songs. Let's get better music on more CD's." A music executive who is working with the technology said the program also identified the "gold content" of a song. This is the part that is supposedly the most likable and can be sampled in television commercials, films and other songs. Several musicians and managers, when told about the technology, laughed at a future in which a computer program listened to their songs to determine if they were good enough to be released. Jordan Berliant, a music manager at Tenth Street Entertainment, said, "What creates a hit is that people have an emotional reaction to a song, in particular the lyrics. It's difficult to believe that a machine could gauge that." Jaron Lanier, a computer scientist and musician who coined the term "virtual reality," said that the science side of the application seemed sloppy. "As for the music side of things," he continued, "I doubt pop music could get any worse, so using even a meaningless tool like this might result in some improvement." Ms. Reed replied that the scientists at Grupo AIA were recognized as leaders in artificial intelligence. http : // www.nytimes.com Graphic Photos: The Beastie Boys, from left, Adam Yauch, Adam Horovitz and Mike Diamond, yesterday released an antiwar song. (Ryan Murphy) Load-Date: March 12, 2003 End of Document New York Film Festival To Close With 'Her' The New York Times

Time: 01/04/2007  
As a professor of cognitive science at Indiana University who spends his time thinking about the process of thinking, what do you make of Descartes's famed pronouncement, ''I think, therefore I am''? Who knows what that means? It's a tiny, little aphorism. You can interpret it any way you want and say, ''What a wise man he was!'' You first became known in 1979, when you published ''GA del, Escher, Bach,'' a campus classic, which finds parallels between the brains of Bach, M. C. Escher and the mathematician Kurt GA del. In your new book, ''I Am a Strange Loop,'' you seem mainly interested in your own brain. This book is much straighter. It's less crazy. Less daring, maybe. You really know how to plug a book. Well, O.K., I don't know. Questions of consciousness and soul -- that is what the new book was motivated by. You write movingly about your wife, Carol, who died tragically in 1993, and suggest that her soul remains embedded in your consciousness. You can imagine a soul as being a detailed, elaborate pattern that exists very clearly in one brain. When a person dies, the original is no longer around. But there are other versions of it in other people's brains. It's a less detailed copy, it's coarse-grained. You make it sound as if a soul can be Xeroxed. You can't duplicate someone exactly. I didn't say exactly. I said coarse-grained and approximate. Lower-resolution. Aren't you just putting a clever gloss on the phenomenon of memory? Many people believe that our lives end not when we die but when the very last person who knew us dies. Memory is part of it, yes, but I think it's much more than memory. It's the fact that my wife and I, for example, became so intimately engaged that her essence was imported into my brain. Why do you think you are still in mourning after all these years? She died when our children were so young. The chance to watch her children grow up was taken away from her, and that was the thing that absolutely destroyed me. In your book, you also discuss the souls of animals and your conversion to vegetarianism. I don't feel I have the right to snuff the lives of chicken and fish. What about mosquitoes? If a mosquito has a soul, it is mostly evil. So I don't have too many qualms about putting a mosquito out of its misery. I'm a little more respectful of ants. Your father, Robert Hofstadter, won the Nobel Prize in Physics in 1961 for his efforts on behalf of neutrons and electrons. I was 16 when he won. It was a good boost for my shaky ego. I was worried about whether I was a bright person or not. Did you feel reassured when you yourself won a prize -- the Pulitzer, in 1980, for ''Godel, Escher, Bach''? I don't like the idea of prizes, which make too much of a binary distinction between people. But in this case, the prize did me some tangible good. What I gained was academic freedom, the respect of my university. Your entry in Wikipedia says that your work has inspired many students to begin careers in computing and artificial intelligence. I have no interest in computers. The entry is filled with inaccuracies, and it kind of depresses me. So fix it. The next day someone will fix it back. You don't have any interest in artificial intelligence? I've taught a course called ''Hype vs. Hope in A.I.'' Why does this field inspire such nonsense? People who claim that computer programs can understand short stories, or compose great pieces of music -- I find that stuff ridiculously overblown. What does a computer lack that a person has? It has no concepts. I know some people who have no concepts. They do have concepts. People are filled to the brim with concepts. You don't have to know what a concept is in order to have one. DEBORAH SOLOMON http : // www.nytimes.com Graphic Photo (Photograph by Nathan Baker) Load-Date: April 1, 2007 End of Document Harvard And M.I.T. Join to Offer Web Courses The New York Times

Time: 15/06/2008  
Myths & Mechanisms. By Margaret A. Boden. Illustrated. 303 pp. New York: Basic Books. $24.95. With philosophers, psychologists, psychiatrists, neurologists, neuroscientists and computer scientists all trying to explain intelligence, brain and mind research sometimes seems like an intellectual wilderness inhabited by warring tribes. On a few broad issues there is something like a consensus: almost everyone accepts that the mind is not an ethereal essence, that it ultimately can be understood in terms of the brain. Even so, one sometimes runs into an old-fashioned dualist, a spiritual descendant of Descartes who believes that the mind is a ghost in the neurological machine. Margaret A. Boden, a professor of philosophy and psychology at the University of Sussex, England, has been at the forefront of efforts to exorcise Cartesian superstition and establish that the brain is a wonderfully subtle machine. Through a medley of molecular reactions, it processes information -- doing with neurons what a digital computer does with chips. Ms. Boden is not only sure that the brain is a kind of computer, but that an artificial computer programmed to mimic intelligence would really think. In a previous book, "Artificial Intelligence and Natural Man," she explained how computers can, in a crude sense, understand simple sentences and stories and perform other tasks that are called intelligent when people do them. In her new book, "The Creative Mind," she describes more advanced programs that are capable, for example, of drawing pictures and improvising rudimentary jazz. Many people find it hard to accept that a machine can produce anything original. Whether the device consists of gears and pulleys or microchips and software, it seems that it would only be capable of running through predictable cycles, like a washing machine. But even a machine with a small number of pieces can give rise to dazzling, unexpected behavior. Consider Aaron, a program consisting of a few hundred rules regarding artistic style. As Ms. Boden shows in her book, each drawing generated by Aaron is a surprise to its inventor, the human artist Harold Cohen. It doesn't matter that Mr. Cohen wrote every line of the computer code; he couldn't possibly anticipate all the permutations in which the code could be applied. Ms. Boden's purpose is not just to show what computers can do, but to dispel some of the mysticism surrounding art by giving a mechanistic explanation of creativity. She is especially good at describing musical composition. A composer, she says, works within a network of constraints (the principles of harmony), exploring a "search space" of possibilities much as Aaron explores the maze of all possible drawings that can be made with its programmed rules. Of course, a hallmark of creativity is the ability to open up new regions by bending the rules. And so some programs, like Douglas Lenat's Eurisko, can modify themselves. It seems fair enough that a book about creativity should be judged by how creative it is. Ms. Boden is at her most original when she discusses the processes that could have led Samuel Taylor Coleridge to come up with some of the images in "The Rime of the Ancient Mariner," or when she demystifies Friedrich von Kekule's famous discovery of benzene rings, which he made after dreaming of a snake biting its own tail. But not every path she explores leads to surprising vistas. Most of the computer programs in the book will be familiar to anyone who has read some of the popular literature on artificial intelligence. And though her descriptions are usually crystal clear, in one case her metaphor undermines her exposition. In describing a neural network, consisting of a web of artificial brain cells, she likens it to a classroom of children sitting in rows of desks and shouting at one another. I doubt I would have understood that very well if I hadn't already read Jeremy Campbell's book about neural nets, "The Improbable Machine," and William F. Allman's "Apprentices of Wonder." And while Ms. Boden argues convincingly that brains are computers and computers can create, no one has made the point more eloquently than Douglas R. Hofstadter in "Metamagical Themas" and "Godel, Escher, Bach." Still, it's good to have another strong voice fighting obfuscation. The closest thing to a scientific alternative to the computer metaphor is Roger Penrose's proposal, outlined in "The Emperor's New Mind," that the brain works through mysterious quantum interactions, communicating with a Platonic realm where Truth, Beauty and other pure concepts lie. This view, which has been roundly attacked by some three dozen scientists in the December 1990 issue of the journal Behavioral and Brain Sciences, requires that one believe in Platonic mysticism. Even then, the details of how the brain communes with the nether world of ideas must wait, Mr. Penrose tells us, until scientists succeed in the monumental task of reconciling quantum theory with the general theory of relativity. Asked to take this Kierkegaardian leap of faith, some skeptics might find that the idea of the brain as a kind of computer is not so farfetched after all. Load-Date: April 7, 1991 End of Document Huckabee Repudiates Group's Effort The New York Times

Time: 13/05/2004  
Frank Gehry, the architect, says his $300 million new computer science and artificial intelligence building at M.I.T. ''looks like a party of drunken robots got together to celebrate.'' Charles M. Vest, the institute's president, sees it as ''a toy box at dawn,'' ready for the kids to play with. Others have likened its jumble of yellow and white aluminum, polished stainless steel and orange brick towers, tubes, cubes and cones to a Disney animation, a Leger painting, fine Bordeaux wine (for its complexity and variety) or a medieval Italian hill town rising amid the gray rectangular sameness of its section of campus in an industrial part of Cambridge. The building, the Ray and Maria Stata Center for Computer, Information and Intelligence Sciences, embodies the intellectual daring and innovation -- ''the joy of invention,'' as William J. Mitchell, the architectural adviser to Mr. Vest, described it -- that goes on inside M.I.T.'s featureless laboratories. Just as Mr. Gehry talks about his delight in starting new projects without a road map, so the building, which had its official opening on Friday, is intended as a metaphor for the questions and exploration that drive the scientists who occupy it. ''Every week I'm in this building, I feel happier than the week before,'' said Victor Zue, co-director of the Computer Science and Artificial Intelligence Laboratory, who moved in at the end of March. He beamed as he stopped to talk amid the bustle of the two-lane interior ''student street,'' the meandering main corridor, with its bright red, blue and yellow walls. What makes him happy, he said, even more than the whimsical design, the ultramodern laboratories and the natural light pouring through the skylights and huge windows, is that he can retreat to his office for privacy but then emerge to commune with his fellow geeks on the student street and in the other abundant communal spaces. The lack of an interior grid -- along with the lounges, kitchens, a fitness center, a cafe and a child care center, and whiteboards and blackboards seemingly around every bend -- is part of Mr. Gehry's and the institute's plan to spark creative combustion by encouraging the building's occupants to bump into one another. Literally. With all due respect to Harvard, its neo-Georgian brick neighbor to the north, the Stata Center may be one of the smartest buildings on the planet, not just for its computer-assisted design, but also for the minds assembled inside. The line-up includes Tim Berners-Lee, the Oxford-educated physicist credited with inventing the World Wide Web; Rodney A. Brooks, the robotics pioneer, director of the Computer Science and Artificial Intelligence Laboratory; Butler W. Lampson, who wrote the first version of Word; Noam Chomsky, the father of modern linguistics; and six MacArthur genius award winners, including Erik Demaine, a 23-year-old computer scientist who won the prize when he was 22. Who knows what might happen if they all run into one another as they get lost on their way to the restroom or the coffee machine? (In Mr. Berners-Lee's department, it's a $3,100 espresso machine.) The Stata Center is only the biggest complex -- 730,000 square feet, including a below-ground parking garage and outdoor amphitheater -- of the university's $1 billion construction program, which has as one of its primary goals the creation of a greater sense of community on campus. The new construction was undertaken as a response to a 1998 student life report that found, among other conclusions, that as a result of M.I.T.'s lack of ''attractive and convenient space for community interaction,'' students had come to regard ''computer clusters as social space.'' Touring the building on May 4, Mr. Gehry recalled his early meetings with the institute's top administrators. ''They said, 'This is a place where some brilliant, brilliant people hang out,' '' he said. '' 'Some are shy, some are outgoing. Their tendency is to hide in their offices while yearning for some kind of interaction.' '' Still, even as Mr. Gehry, designer of the Guggenheim Museum in Bilbao, Spain, and the new Disney hall in Los Angeles, was inspecting his latest creation, there was grumbling that maybe a little less interaction was in order. ''It's a cool building, but sometimes it's very annoying,'' said Kunal Agrawal, 24, a graduate student in supercomputing technologies, who was trying to concentrate at her computer in a large, open space while a couple of her fellow students were trying to get her attention by calling her name from the atrium above. ''It's too noisy.'' She said she hoped she would be one of the lucky people given an office in the building next year. Ms. Agrawal said that her adviser had given her headphones to block out the noise, and that she had covered the glass walls in front of her desk with sheets of paper. This is the sort of thing Mr. Gehry said he was hoping would happen: that the occupants would adapt the building to their needs. He has even supplied movable plywood partitions. All along, the center, named for Ray Stata, an M.I.T. alumnus and co-founder of Analog Devices, and his wife, Maria, was a collaboration between the architect and its occupants. ''I put up my hand and said, 'I like opening windows,' '' said Mr. Berners-Lee, who was talking in his office with the windows open, courtesy of Mr. Gehry. There are already signs that the design is inspiring a certain playfulness: an inflatable penguin on a pillar, a beach ball thrown up on a column, reports of the philosophers' playing Koosh ball in the two-story atriums. Oversize posters of orangutans were rolling out of a computer printer two days before the official opening. The posters were an inside joke, referring to one of Mr. Gehry's early design inspirations: the habits of orangutans, who retire to the treetops for privacy but move down to the ground for socializing. As Mr. Gehry was aware before he even sketched his first experimental drawings on M.I.T. napkins five years ago (the napkins are preserved for history in a plastic bag in the office of Chris Terman, a computer scientist who was the building's liaison to Mr. Gehry), the Stata Center occupies historic, even mystical ground. It sits on the site of the former Building 20, a boxy wooden structure that was thrown up in 1943 and became known as the Magical Incubator for the breakthroughs that took place inside, including the invention of radar and Mr. Chomsky's pioneering work in linguistics. ''This building is on the precise site of one of the major flourishings of innovation in the 20th century,'' said Steven Shapin, a professor of the history of science at Harvard. ''Building 20 was just a shack, completely lacking in design, ugly, boring. Its magical power was that it brought out the best from those inside it. And now we have the direct successor that is the opposite of a nothing building, designed not only for delight, but for encouraging innovation. If it has even a fraction of the effect of Building 20, it will be a roaring success.'' The beauty of Building 20, Mr. Shapin, Mr. Gehry and legions of others said, was that it was always intended to be temporary -- although it lasted 55 years -- and so its occupants felt free to knock down walls and doors if they wanted to run wires or just come into closer contact with one another. Mr. Gehry said he designed the center in that spirit. The center, said Jerold S. Kayden, a professor of urban planning and design at Harvard, is M.I.T.'s way of ''turning itself inside out,'' and for the first time reflecting through its architecture the bold experimentation of the researchers and their work. ''This is M.I.T. saying, 'No more plain paper wrapping for science,' '' Mr. Kayden said. '' 'It's party time.' '' http : // www.nytimes.com Graphic Photos: Building 20, shown here in 1945, preceded the Stata Center. It was known for the discoveries made within its walls but not for its design. (Photo Courtesy M.I.T. Museum)(pg. E6) M.I.T.'s Ray and Maria Stata Center, a 730,000-square-foot complex devoted to computer science. An interior view of the sprawling Stata Center, designed to encourage colleagues to mingle. (Photographs by Robert Spencer for The New York Times)(pg. E1) Load-Date: May 13, 2004 End of Document New Economy; Intriguing possibilities in sensors, an on-ramp for electronics and biotechnology. The New York Times

Time: 15/10/2006  
magazine editors have few more tried-and-true formulas for boosting newsstand sales and Web traffic than best-of lists. Rolling Stone's 500 Greatest Albums of All Time; Spin magazine's 100 Greatest Albums 1985-2005; Pitchforkmedia.com's Top 100 album lists for the 1970's, 80's and 90's: vast digests of gathered knowledge and opinion, usually the work of teams of editors, journalists and musicians, painstakingly assembled. But their collaborative efforts pale in comparison to the solo work of Piero Scaruffi. In addition to his annual album rankings and all-time rankings (Captain Beefheart's ''Trout Mask Replica'' currently ranks No. 1), Mr. Scaruffi's multilingual Web site (www.scaruffi.com) has a list of the best rock bands and individual artists -- best guitarist, best keyboardist, best male and female vocalist -- of each year since 1955. A ranking of the 164 best jazz albums of all time, complete with 903 honorable mentions. A list of the 39 best ''short'' songs released from 1955 to 1979. The 119 best psychedelic albums of all time. The best all-time guitarists, drummers and keyboardists. For a one-man operation, the amount of material is staggering. And Mr. Scaruffi, 51, a freelance software consultant and occasional university lecturer living in Redwood City, Calif., also runs thymos.com, which contains his equally prolific writings on topics of consciousness and cognition. Not surprisingly, he says running the two sites has become a full-time job. ''I barely have time to breathe,'' he said in a telephone interview. Before the hobby became the job, Mr. Scaruffi, who has a degree in mathematics from the University in Turin, had worked in artificial intelligence and computers. That's now a fallback when he needs the money. ''If I need to buy a new car, then I have to go out and do software consulting,'' he said in a light Italian accent. His work dominates both his life and his living room. He recently transferred his many piles of books (a ''vertical sorting method'') to 11 bookcases with six shelves apiece. Vinyl is kept in the garage, he said, and CD's -- unless they are part of the ''essential'' pile near his desk -- are housed in giant boxes around the house. The CD's can sometimes go unheard for several years before Mr. Scaruffi gets around to reviewing them, making his end-of-the-year lists a perpetual-motion machine. Last month his site had 646,640 hits, according to a tabulator available on his site. The web traffic analyzer Alexa.com ranks scaruffi.com at around 59,000, below such established independent music blogs as Largehearted Boy (blog.largeheartedboy.com) but ahead of heavily linked favorites like You Ain't No Picasso (youaintnopicasso.com). Mr. Scaruffi's music site is colorful but stark, consisting mainly of simple text with basic color backdrops, with limited advertising. The ads help cover the $1,000 to $2,000 a month he spends on CD's (adding to a collection of an estimated 20,000). The site's simplicity harkens back to Mr. Scaruffi's text-only electronic fanzine, first published for a group of 20 in 1985, back when e-mail was closer to Arpanet than to AOL. His initial foray into electronic punditry was a function of his technological acumen and his prowess as a musical savant while growing up in Trivero, Italy. ''When I was in high school in the early 1970's I was the 'expert' on music,'' said Mr. Scaruffi, who moved to California in 1983. For his senior project he turned in a 50-page paper on the history of rock music. His classmates' papers, he said, totaled two or three pages. ''People were constantly asking for my advice: 'Tell me what five albums I should buy now,' or 'Tell me what are the five best heavy metal albums of all time,' '' Mr. Scaruffi said. ''Eventually you get tired of answering the same question, and you prepare a list. Then the list becomes many lists.'' He collected a good amount of his catalog of rankings and essays from the site in ''A History of Rock Music, 1951-2000,'' which was published in 2003 and has sold about 1,500 copies by his estimate. That same year he also published ''Thinking About Thought: A Primer on the New Science of Mind, Towards a Unified Understanding of Mind, Life and Matter,'' which deals mainly with consciousness and artificial intelligence. His studies in those latter subjects have included terms as a visiting scholar at Stanford and Harvard and lecturing posts at, among other places, the University of California, Berkeley, where last year he taught The Nature of Mind (an introduction to cognitive science) and A History of Knowledge. But visiting his site and reading his arguments against the Beatles' legacy (''Ray Davies of the Kinks was certainly a far better songwriter than Lennon & McCartney'') or his list of ''Most significant works of music 1950-1990'' (equal parts Karlheinz Stockhausen and Cecil Taylor), readers could expect Mr. Scaruffi to be dedicated solely to developing a complete music compendium, a sort of musical Wikipedia without all the extra help. Not so, he said. ''Probably my biggest ambition would be to write a history of knowledge,'' he said. ''Something that packages all of my interests together: literature, science, philosophy, politics -- whatever.'' Music, he said, is just one part of a much larger puzzle. http : // www.nytimes.com Graphic Photo: Piero Scaruffi at his office in Redwood City, Calif., surrounded by the vast collection of CD's, books and clippings he uses to stoke his wide-ranging Web site, which gets hundreds of thousands of hits each month. (Photo by Peter DaSilva for The New York Times) Load-Date: October 15, 2006 End of Document Computer Wins On 'Jeopardy!': Trivial, It's Not - Correction Appended The New York Times

Time: 17/02/2011  
WORKS By Steven Pinker. Illustrated. 660 pp. New York: W. W. Norton & Company. $29.95. "Interdisciplinary" is a suspect word -- it is too often the grayspeak of campus grandees -- but artificial intelligence and the theory of evolution do seem to be making an interdisciplinary merger. Steven Pinker, a professor of psychology at the Massachusetts Institute of Technology, is one of the clearest writers about this new synthesis. "How the Mind Works" examines brain mechanisms -- or rather, computational models of brain mechanisms -- and the evolution of our reasoning abilities, emotions and social and sexual behavior. The marriage is by no means complete; Pinker exaggerates when he says that "without the computational theory, it is impossible to make sense of the evolution of the mind." I suspect the evolutionary insights in the book would have made good sense to that precomputational Victorian Charles Darwin. However, there is still a strong unity in this book. The computational and evolutionary parts, for instance, both reject the idea that the mind begins life, in Locke's phrase, as a sheet of blank paper. Artificial intelligence is a powerful test; it requires you not merely to talk about how a mental task is accomplished, but to write a program to prove it. If you program a robot as initially blank except for a general learning rule or two (I mean something like the psychologist's "law of association": the robot should do more of whatever it has associated with pleasurable, or reinforcing, consequences), it will not develop much of a mind. It fails because the environment contains too many stimuli, and each action has too many possible consequences. Unless the robot has been programmed to recognize which stimuli to concentrate on and how to assess them, it is hopeless at human tasks. Indeed, for many tasks, including walking or holding or reading a newspaper, the robot will be hopeless even if it contains state-of-the-art software. Humans find them easy enough in practice, but the rocket scientists are baffled about how we manage them in theory. As for walking, "no one has yet figured out how we do it." When you hold up your arm, your brain is "solving a near-intractable physics problem." When you use your eyes, you solve "what engineers call an 'ill-posed problem.' It literally has no solution." Pinker adds, "I believe that the discovery by cognitive science and artificial intelligence of the technical challenges overcome by our mundane mental activity is one of the great revelations of science, an awakening of the imagination comparable to learning that the universe is made up of billions of galaxies or that a drop of pond water teems with microscopic life." He concludes that the mind must possess a set of specialized, preprogrammed modules that are quite unlike one another, each designed for a task such as perception or social exchange. Evolutionary theorists reject the blank-paper theory for a related reason. Behavior is adaptive -- well designed to enable the animal to live and breed. Adaptive behavior is not any old behavior; most of the things an animal could do would make it more likely to die. If animals began life with white-paper minds, there would be no reason for them to learn adaptive rather than unadaptive behavior; they must have, in Konrad Lorenz's phrase, an "innate schoolmarm" to teach them what to learn. But is human behavior adaptive in the way that Darwinian theory predicts? Many critics doubt it. Some, like Alfred Russel Wallace (co-discoverer of natural selection with Charles Darwin), suggested that our brains are more powerful than is needed for survival and reproduction, and that we have more elevated tastes than we absolutely need. Why should natural selection supply us with the ability to acquire appreciation for art or a skill in calculus? Others have made the opposite case: we are too irrational, too ready to believe in absurd animistic causes and too dumb when it comes to probability and statistics. I am persuaded by Pinker's main claims, that our minds evolved by natural selection and that our mental abilities require elaborately designed programs. However, I have some fairly high-level disagreements. I could pick an argument with his theory of the emotions, with his idea that our mental adaptations are out of date in modern Western society, with his evidence from questionnaires, with his generally dismissive attitude toward cultural influence. But I'll pick on another issue: modifiability. Pinker includes in a list of the idiotic beliefs held by other scholars "that people could just as easily be conditioned to enjoy the thought of their spouse being unfaithful as to be upset by the thought." He discusses how natural selection will theoretically favor sexual jealousy, and how the facts (Margaret Mead and disciples notwithstanding) match the theory. Sexual jealousy, I agree, is a Darwinian adaptation that enabled some ancestral humans to outreproduce their more relaxed contemporaries, who did not end up among our ancestors. But to show something is an adaptation says nothing about how easy it may be to modify. In evolutionary theory, people learned sexual jealousy in the range of environments occupied by ancestral humans. But what about the new environmental possibilities of the present? Consider, as an analogy, the genetic disease phenylketonuria, which renders people unable to metabolize phenylalanine, with potentially disastrous results. Normal diets contain phenylalanine, and for those diets it would be idiotic to say that people with the gene for phenylketonuria could just as easily grow up with or without phenylketonuria. Once the disease was understood, diets were engineered that lacked phenylalanine; the disease can be almost eliminated by these diets, and it is now in a sense equally easy for someone with the gene to grow up with or without phenylketonuria. Jealousy certainly develops in all the social environments we know. But technology can create new environments. If we understood how jealousy develops, we might be able to modify it. I can imagine a society in which people are conditioned to enjoy the thought of their spouse's being unfaithful. Elsewhere in the book Pinker is admirably clear on a related point, that to show that natural selection favors something is not the same as to justify it morally. He describes how he personally has ignored "the solemn imperative to spread my genes. By Darwinian standards I am a horrible mistake. . . . But I am happy to be that way, and if my genes don't like it, they can go jump in the lake." READERS of Pinker's earlier book "The Language Instinct" will be delighted to see there is "a new Pinker." After that masterpiece, expectations are inevitably high, but I was not disappointed. "How the Mind Works" is just as literate -- witty popular science that you enjoy reading for the writing as well as for the science. Pinker has breathed marvelous life into the computational models, the originals of which are buried in nerdish obscurity. He knows when to hold his readers' attention with an illustration or a joke. No other science writer makes me laugh so much. He has good movie quotes -- whether a Mae Westism ("Men like women with a past because they hope history will repeat itself") or the theory of why handsome men pay prostitutes, posed in a movie about Heidi Fleiss ("They're not paying you for the sex. They're paying you to go away afterwards"). His politics do not appear to be conservative (indeed, he has some liberating ideas for both feminists and liberals), but he can be delicately politically incorrigible. He refers to "rain forests -- or, as they used to be called, jungles," and to "knickknacks in the shapes of animals and naked women, which archeologists euphemistically call 'fertility symbols.' " He also neatly insinuates that we could equally well call pornography a fertility symbol. He is a top-rate writer, and deserves the superlatives that are lavished on him. Graphic Drawing Load-Date: October 5, 1997 End of Document Online Courses: High Hopes, Trimmed The New York Times

Time: 30/12/2001  
Nostradamus, this was the year of Stanley Kubrick's movie "2001: A Space Odyssey." It has more than fulfilled its terrifying prophecy of climactic events at the millennium. An entire generation of baby boomers grew up with the film as emblematic of the anticipation and apprehension of the year 2001 -- which technically began the millennium as opposed to the fanfare of the previous year's celebrations. The 1968 movie presented a darkly pessimistic view of humanity wrapped up in extraordinary imagery. Kubrick's insights into the destructive nature of mankind, a constant in all his films, has kept his message, and the movie, alive these past 30 years. The director was born in the Bronx, but lived in Britain for most of his adult. Yet, he was strongly tied to New York City and had a strange premonition about it -- which tragically came true in the events of Sept. 11. Looming over "2001," appearing at key points of the story, is a large black monolith, a mysterious, sleekly technological object seen both by the ape-man millions of years ago and also in 2001 on the moon, pointing its radio signal to the planet Jupiter, the object of the last voyage of the doomed astronauts in the film. In one of many eerie parallels to the terrorist attack on the World Trade Center, the image of the black monolith has reappeared -- literally -- at ground zero, in the form of proportionally similar black glass slab buildings that rise above the ruins of the twin towers. For years, Kubrick had abandoned the apocalyptic, end-of-the-world themes from the film, turning instead to history ("Barry Lyndon"), horror ("The Shining"), war ("Full Metal Jacket") and sex ("Eyes Wide Shut"), before revisiting, just before his death in 1999, his dark vision of the future in "A.I.: Artificial Intelligence." Realized at Kubrick's request by the director Steven Spielberg, the film retains enough of Kubrick's original vision to again present images that predict the horror later visited on Lower Manhattan. Kubrick's "2001," based on a story by the science fiction writer Arthur C. Clarke, is a morality tale of the evolution of man and the double-edged sword of technology, a tool for both creation and destruction. The film ends with the ambiguous promise of the next evolution of man and the future of peace, perhaps influenced by otherworldly forces, variously interpreted as aliens or religion. In the film's enigmatic beginning -- almost an anthropological Discovery Channel documentary about the evolution of man -- apes are seen foraging on the African savannah, when there appears a mysterious technological object: a tall rectangular black monolith. Soon after, perhaps somehow due to the monolith, these apes discover the use of an animal bone as a tool, and the leader of the previously peaceful creatures commits the first murder of their brethren, using the bone as a weapon. The implication is that this discovery of the tool as weapon is essential to the evolution of ape into man. In a scene compressing eons of time, the triumphant ape/man throws the bone into the air. It transforms, immediately, from distant past to future, into a similarly shaped spacecraft to the moon. The identity of form, and congruence of the first weapon with the idea of technology and flight connects the film "2001" with the current year 2001. In a frightening inversion of film and reality, the terrorists used the two aircraft in a similar manner, turning the planes into tools of mass destruction, and like primitive man, hurled them like huge bones into the two towers, causing death multiplied by the thousands. Now, the smoking ruins of the towers are surrounded by architectural sentinels that, in color and proportion, recall the black monolith of "2001," witnesses to the primal scene of devastation. All the tallest buildings adjacent to ground zero are black monolithic slabs: 1 Liberty Plaza, a 700-foot-tall rectangular structure; Deutsche Bank, whose gashed facade stands witness to the collapse of the towers; and the aptly named Millennium Hotel, a black glass-sheathed building. This year, in Kubrick's posthumous film "A.I.: Artificial Intelligence," which the director had worked on for many years, he returns to the setting of an ominous future with its uncomfortable melding of robots and humans. In the climactic scene, a robot child is flown in a helicopter to confront his replicants, at the site of the "Forbidden Zone." That location is none other than Lower Manhattan, in ruins -- the remains of the city after World War III. There, half sunken below the water, is the World Trade Center. THE movie came out in June, the terrorists struck in September. Even beyond the grave, Kubrick remains sadly ahead of the curve. Unfortunately, it seems mankind has not changed much in the course of its evolution, though the means of destruction has advanced exponentially beyond the hand-held bludgeon. In the aftermath of both the film and the year 2001, one is left exhausted and bewildered, with a sense of relief that it is over and a barely concealed disbelief that it happened after all. At this point, perhaps the glimmer of hope at the end of "2001," where the elderly astronaut is transformed by the black monolith into an embryonic star child gazing at the earth, is a metaphor for the restoration and rebirth of humanity -- and New York. http : // www.nytimes.com Graphic Photo: The monolith is the center of attention in this scene from Stanley Kubrick's "2001: A Space Odyssey." (Culver Pictures) Load-Date: December 31, 2001 End of Document Google Is Taking Your Questions (Spoken, via the iPhone) The New York Times

Time: 19/02/2013  
Western Culture in the Computer Age. By J. David Bolter. 264 pages. University of North Carolina Press. Hard-cover, $19.95; paper, $8.95. J. DAVID BOLTER, the author of ''Turing's Man: Western Culture in the Computer Age,'' is both a classicist who teaches at the University of North Carolina and a former visiting fellow in computer science at Yale University. This unusual combination of talents may not qualify him absolutely to offer a humane view of the computer age, or what he refers to as the age of Turing's man, after Alan M. Turing, the English mathematician and logician who offered early theoretical descriptions of both the computer and advanced artificial intelligence. Christopher Lehmann-Haupt reviews book Turing's Man by J David Bolter But his two fields of knowledge certainly provide Professor Bolter with an unusual perspective on contemporary developments that many observers fear are about to usher in an age of heartless quantification, if not the final stages of Orwellian totalitarianism. In Professor Bolter's view, every important era of Western civilization has had what he calls its ''defining technology'' which ''develops links, metaphorical or otherwise, with a culture's science, philosophy, or literature; it is always available to serve as a metaphor, example, model, or symbol.'' To the ancient Greeks, according to Professor Bolter, the dominant technological metaphor was the drop spindle, a device for twisting yarn into thread. Such a metaphor implied technology as a controlled application of power. To Western Europe after the Middle Ages, the analogues to the spindle were first, the weight-driven clock, a triumph of mechanical technology, and later, the steam engine, a climax of the dynamic. In Professor Bolter's subtly developed argument, the computer - obviously enough the present age's defining metaphor - is an outgrowth of both the clock and the steam engine. Yet, paradoxically, the computer also represents a throwback. Everything follows from this. In a series of closely reasoned chapters on the way in which the computer has redefined our notions of space, time, memory, logic, language and creativity, Professor Bolter reviews a subtle but recurring pattern in which the computer simultaneously climaxes Western technology and returns us to ancient Greece. He concludes that if the ancient ideals were balance, proportion and handicraft (the use of the spindle), and the Western European one was the Faustian quest for power through knowledge (understanding a clockwork universe to attain the dynamism of the steam engine), then Turing's man combines the two. ''In his own way, computer man retains and even extends the Faustian tendency to analyze,'' Professor Bolter concludes. ''Yet the goal of Faustian analysis was to understand, to 'get to the bottom' of a problem,'' whereas ''Turing's man analyzes not primarily to understand but to act.'' He continues: ''For Turing's man, knowledge is a process, a skill,'' like the ancient arts of spinning or throwing a pot. ''A man or a computer knows something only if he or it can produce the right answer when asked the right question.'' Faustian depth ''adds nothing to the program's operational success.'' Now in portraying Turing's man, Professor Bolter may seem to be overburdening a few simple metaphors. Yet his argument is developed with remarkable concreteness. Indeed, if his book has any fault, it lies in the extent to which he has detailed the slightly repetitious and eventually predictable pattern of argument described above. Yet what is far more important about ''Turing's Man'' is its success in bridging the gap between the sciences and the humanities. I can only guess at how much it will inform the computer technologist about philosophy and art, but I can vouch for how much it has to say to the nonspecialist about how computers work. The inaccessibility of the computer's inner functioning may well be a key to the author's case that Turing's man is returning to the ancient Greek's satisfaction in the surface of things, but after reading Professor Bolter's book, this reader found the computer far less mysterious. Not incidentally, the book makes us understand why computers aren't really all that good at doing mathematics (they can't get a grip on the notion of infinity); and it far surpasses Andrew Hodges's recent biography of Alan Turing in explaining Turing's Game for testing artificial intelligence. But most provocative about this study is what it has to say about the political implications of the computer age. Will Turing's man prove the instrument of Orwell's Big Brother, as so many observers are inclined to fear? Very likely not, says Professor Bolter: ''Lacking the intensity of the mechanical-dynamic age, the computer age may in fact not produce individuals capable of great good or evil. Turing's man is not a possessed soul, as Faustian man so often was. He does not hold himself and his world in such deadly earnest; he does not speak of 'destiny' but rather of 'options.' And if the computer age does not produce a Michelangelo and a Goethe, it is perhaps less likely to produce a Hitler or even a Napoleon. The totalitarian figures were men who could focus the Faustian commitment of will for their ends. What if the will is lacking? The premise of Orwell's '1984' was the marriage of totalitarian purpose with modern technology. But the most modern technology, computer technology, may well be incompatible with the totalitarian monster, at least in its classic form.'' Indeed, according to Professor Bolter, Turing's man may be more inclined to anarchy than to totalitarianism. This may be whistling past the graveyard. But in Professor Bolter's stimulating analysis, it also makes a kind of homely sense. End of Document BRIDGE; Be Careful With Experts From Cyberspace The New York Times

Time: 06/10/2014  
SPARKBy John Twelve Hawks Illustrated. 301 pages. Doubleday. $25.95. ''Spark'' is an even better introduction to the abundant dystopian talents of John Twelve Hawks than ''The Traveler'' was, maybe because it's less gimmicky and does not include a heroic breed of fighters called Harlequins. And maybe because Mr. Twelve Hawks (probably not his real name) has become a much better writer since ''The Traveler'' kicked off an elaborate Orwellian trilogy that, thrillingly as it began, eventually bogged down in subplots and digressions. Clearly exhilarated by the fresh start that ''Spark'' affords him, this author creates a much simpler premise that forges a breathless action plot out of many of the ideological tenets of the ''Traveler'' books. Its main character thinks of himself as a Spark inside a Shell since undergoing a drastic Transformation. Translation: He had a bad motorcycle accident and believes that even though his body can still walk and talk, he is in fact dead. His idea of a good time is to nail a stake to the floor, attach himself to that stake by a string and walk in perfect circles. No, that's not the exciting part of ''Spark.'' And neither are any of the traits that put our hero (who goes unnamed as he narrates most of the book) in the realm of high-functioning autism. He hates being touched. He experiences no emotional responses other than curiosity, boredom and disgust. He has programmed his phone with photographs of 80 faces, each one signifying a different human response, like joy or pain or fear, so that he can tell what reaction he is eliciting in others. He has the perfect job qualifications for a hit man, and that's the occupation he has fallen into. So when we first meet him, he is at a stakeout in Brooklyn, watching a Russian businessman named Peter Stetsko park his car. ''Look right. Look left. No one was in the street. I walked over to the car, held up the phone, and compared Stetsko's photograph to the reality in front of me,'' he tells us. ''Then I raised my weapon and shot reality in the head.'' As in earlier books by Mr. Twelve Hawks, this protagonist lives in an ominous, technology-dominated world where machines aid or spy on all aspects of life. Sometimes, they can do both, and the few free souls left in society fear that a takeover by artificial intelligence isn't far away. There are ''bash mobs'' and Luddite gangs that arise to rebel against the forces of technology, spying and totalitarianism, freedom fighters who like nothing more than stomping on the equivalent of Google Glass. Mr. Twelve Hawks, who has become famous for his anonymity, publishes treatises on these matters at wespeakforfreedom.com, which is embraced by the good guys in this book's plot. At first, we follow the hit man around the globe as he goes from assignment to assignment, describing the physical experience of being an automaton in the spooky new world. It is a dystopia in which money buys everything, especially youth; the main markers for the poor are now signs of aging even more than signs of starvation. The hit man observes all this unquestioningly and takes his orders from a woman he knows mostly long distance. Since he is exceptionally crafty at executing these jobs, part of the fun is in watching him improvise. One very worthwhile detour involves his taking voice coaching to acquire a lower-class British accent so he can pose as a workman to get onto an estate outside London by claiming to be a delivery man for something called Jolly Good Fellows. What corrupt mogul would say no to that? The woman who coaches him has a beloved dog. And dogs turn out to be the hit man's first soft spot. He rates them highest on the pyramid of life-forms, and his archenemy is a fellow hit man whom he once caught savagely torturing a canine victim. This, like every bread crumb Mr. Twelve Hawks drops during the course of this story, will come to matter greatly. Midway through the book, it becomes apparent that the main character -- who is beginning to think of himself as Jake, his pre-accident name -- is regaining his humanity. That Spark is beginning to catch fire. It's possible to pinpoint the moments in the story when his amorality is pushed too far, or the man inside him is actually moved, or he just tastes something that has flavor; one way or another, the robotic killer begins to think about what he's doing. Because this man was always very, very smart, the part of the book that puts his brain to full use truly gallops. Mr. Twelve Hawks sets up the battles in ''Spark'' as more than simple combat. His appeal lies in his pairing of one system of belief against another and letting them duke it out. There is someone here who tries to justify actions with this: ''Everything that goes on in the universe is a physical process that involves boson particles that have an integer spin such as one or two, and fermion particles that have odd, half-integer spins.'' By everything, this person means everything. Whoever is on the other side of the argument must hear it out and can't dismiss it out of hand. And how many dystopian thrillers give René Descartes a significant role? Descartes's ''Cogito, ergo sum'' comes up repeatedly as a matter of crucial important in a world where artificial intelligence grows more powerful every day. Does the fact that a computer thinks means that it exists? Think you can answer that easily? Not so fast: John Twelve Hawks would like to spend a lot of ''Spark'' mulling that over with you. The book's cover art is unusually intricate. Here's why: The artist is Michael J. Windsor, whose credits include ''The Da Vinci Code'' and other work by Dan Brown. http : // www.nytimes.com/2014/10/06/arts/spark-the-latest-dystopian-novel-from-john-twelve-hawks.html Graphic PHOTO Load-Date: October 7, 2014 End of Document As Facebook Loses Luster, Tech Stocks Await Fallout The New York Times

Time: 04/07/2014  
-- Nolan Bushnell had only recently graduated in electrical engineering from the University of Utah when he came up with the idea for a computer game that batted a table-tennis ball across a screen. That game, Pong, proved so successful that it helped to popularize computer games during the 1970s. So influential has it become, that Pong was chosen as the starting point for ''Digital Revolution,'' an exhibition that opened on Wednesday at the Barbican Center in London. The show explores the evolution of digital media, from Pong's debut in 1972 to recent experiments by designers, artists, musicians, computer coders and filmmakers with augmented reality, artificial intelligence, robotics and other technologies. As well as tracing the history of digital media -- including the development of early home computers, digital artworks and websites -- ''Digital Revolution'' examines the technology's influence on movies, fashion, music, gaming, communication and architecture. ''I don't think an exhibition has brought all of these digital forms together before,'' said Conrad Bodman, the show's curator. ''We want to show the astonishing breadth of digital creativity, and the connectivity between different forms.'' The Barbican exhibition coincides with a surge of interest in digital media among cultural institutions worldwide. The Museum of Modern Art in New York recently acquired the first digital typefaces and the first downloadable app, Björk's ''Biophilia,'' for its collection. The Victoria & Albert Museum in London is expanding the digital component of its collection too; and the New Museum in New York is set to open a dedicated space in September for its recently established Incubator for Art, Design and Technology. Analyzing the effect of digital technology on contemporary life is an increasingly important theme in contemporary art with some of the younger artists featured in ''The Encyclopedic Palace,'' the official exhibition at last year's Venice Art Biennale in the forefront. Among them are Ed Atkins, a Briton whose work is currently exhibited at the Serpentine Sackler Gallery in London through Aug. 25 and at Palais de Tokyo in Paris until Sept. 7, and the French artist Camille Henrot, who recently opened a show at Kunsthal Charlottenborg in Copenhagen, which runs through Aug. 17. The Barbican was an early institutional adopter of digital culture, having presented ''Game On,'' one of the first video-game exhibitions, also curated by Mr. Bodman, in 2002. More recently, it has commissioned ambitious digital environments, such as Rain Room, designed by Random International as a space enclosing a rainstorm that stops suddenly when sensors detect anyone approaching. Geographically, the Barbican is ideally located thanks to its proximity to the thriving digital industry in the area of East London officially known as ''Tech City,'' and unofficially as ''Silicon Roundabout'' in honor of the traffic junction at its heart. One of the challenges that arises in exhibiting a history of digital media is that many technologies from the 1970s, 1980s and 1990s are now so outdated that it is difficult to display them in their original forms. Mr. Bodman and several dozen technicians have been preparing for the opening by testing the riskier technologies off-site for several months. Initially, they hoped to show the vintage exhibits, like Pong, on their original hardware, but have had to improvise in some cases. ''Sometimes the hardware was impossible to get hold of, or it was too expensive,'' Mr. Bodman recalled. ''Often it isn't robust enough to run in a public space. Although we have also had the problem that a lot of early software won't run on contemporary browsers.'' The technical glitches have largely been solved, and the Barbican's curatorial team has tracked down most of the chosen exhibits, often on online forums or auctions, though some have proved elusive. ''We really wanted to include Nolan Bushnell's Computer Space, but it is too rare and too fragile,'' said Mr. Bodman, of the Pong designer's first game. ''Though we have also had lucky breaks like the guy who called up to say that he'd worked on the Sinclair ZX80 computer and had some prototypes. Would we like to show them? Yes, please.'' ''Digital Revolution'' also features work by women artists and designers whose contributions to digital culture are often overlooked. They include Lillian F. Schwartz, a pioneer of computer art since the 1960s, and Susan Kare, who designed key elements of Apple's digital interfaces, the onscreen symbols most of us still use to operate computers, during the 1980s. Intriguing though the potted history of digital culture is, much of the show consists of recent work. One section is devoted to the dynamic subculture of independent video-game developers. Another deconstructs the elaborate movie visual effects created by Oscar-winning design studios, including Double Negative's work for 2010's ''Inception'' and Framestore's for 2013's ''Gravity.'' Specially commissioned projects, exhibited throughout the labyrinthine Barbican, also explore the creative possibilities of recent technological advances. At the entrance, visitors can draw on tablet computers to contribute to a giant crowd-sourced animation, which is relayed across a cluster of 24 screens and was devised by the British design group Universal Everything. In the Pit theater, Usman Haque and Dot Samsen, who work together at the Silicon Roundabout-based design studio Umbrellium, have created a three-dimensional light field where people use lasers to ''sculpt'' light into what appear to be physical structures. The exhibition ends with glimpses of the future in recently developed works, including 3D-printed clothing by the Dutch fashion designer Iris van Herpen and a robotic group of digital pets designed by the London- and New York-based architecture group Minimaforms. Using artificial intelligence, the pets have been programmed to shy away from large groups and to approach smaller ones. ''There's so much happening in this field, but we're only 50 years into it,'' Mr. Bodman said. ''People say we're in a golden age of digital media, though we're just at the beginning.'' http : // www.nytimes.com/2014/07/04/arts/design/Tracking-the-Digital-Revolution-From-Pong-to-Gravity.html Load-Date: July 4, 2014 End of Document A Smart Robot Runs With the Wrong Crowd The New York Times

Time: 27/06/2014  
 Ray Kurzweil has made a name for himself in the past few decades as an inventor, futurist and best-selling author. Now, he's heading Google's artificial intelligence efforts. Kurzweil appeared before a standing-room only crowd at Google's annual software developer conference on Wednesday to discuss his work for the search giant. He's currently leading a team that's trying to develop artificial intelligence by modeling the functioning of the human brain. The goal is to create software that can recognize language, communicate with users and understand books and documents. Related: Ray Kurzweil on the future of humanity Kurzweil ended up at Google in late 2012 after meeting with CEO Larry Page to give him an advance copy of his book, "How To Create A Mind." Kurzweil was looking for an investment in a company he was planning to launch that would focus on reverse-engineering the brain. Page invited him to do it at Google instead. "It's been terrific," the 66-year old Kurzweil said of his time with Google. "It's really the only place I could do this project." Kurzweil is known for provocative statements about how technology will shape our future, and critics have accused him of being long on hype and short on substance. He didn't disappoint his fans (or critics) at Google I/O. He said Wednesday that we'll be 3D-printing our clothing by 2020, and he hopes to live long enough to achieve "functional immortality" by uploading his consciousness to a computer. Kurzweil clearly has a tendency toward the grandiose, but there's no doubting his technical chops. In addition to his best-selling books, he's developed pioneering technologies ranging from music synthesizers to a print-to-speech reading machine for the blind. Kurzweil said Wednesday that supercomputers can already provide the processing power required to match the raw number of calculations the brain makes each second. The challenge his team is facing is figuring out how to model the development of hierarchical ideas that depend on one another. Current search technology "is not fully modeling the ideas that you have when you write an article or a blog post," he said. "That's what we'd actually like to understand, and then you'd be able to dialogue with your search engine to give it complex tasks and interact with it the way you would with a human assistant." Kurzweil said his current work at Google, while cutting edge, is just the latest development in a decades-long project. "I've been thinking about thinking for 50 years," he said. TM & © 2014 Cable News Network, Inc., a Time Warner Company. All rights reserved. Load-Date: June 28, 2014 End of Document Most valuable brands: 9 American and 1 from China CNN Wire

Time: 08/07/2001  
latest movie, "A.I.," depicts the futuristic concept of a robot boy with artificial intelligence. The reality of a truly emotive robot seems a long way off (possibly even longer than the movie itself). In the interim, we should focus on some things that are less daunting -- and more easily attainable -- that capitalize on existing technology: THE SENTIENT GLOBAL POSITIONING SYSTEM -- In-car navigation systems plot the most efficient route between two points. But what we need is something that would help plot a career path. For instance, the car would flat-out refuse to drive to Silicon Valley for an interview. On-board word-processing software would help the owner complete a resume but also compose a standard legal defense when he is sued for driving while trying to write a cover letter. The intelligent navigation system would also nag when necessary. We know exactly where Taco Bell is; what we need is someone to tell us to stick to our diets. THE SMART MICROWAVE -- This new oven would be voice-enabled but need a mere five words: "The baked potato is done." THE GEOGRAPHICALLY SENSITIVE AUTOMATED PHONE ATTENDANT -- The programs that tell you to "press 1 if you have a touch-tone phone" should be tailored for people in different regions. Using Caller ID to discern locations, the systems would then give geographically appropriate instructions: For California: Press one. Quickly! Before you lose electric . . . New York: You're waiting for an engraved invitation? Press 1 already! Florida: Press 1 for Bush. Press 2 for Gore. Press 1 for Gore. Press 2 for Bush. THE WISE VCR/TIVO -- Television recording gadgets already let you fast-forward over advertisements, and the TiVo device automatically records programs that it discerns we might like. But what we need is for these devices to selectively erase the parts of television programs and movies that drive us nuts. "Who Wants to Be a Millionaire" would skip questions worth less than $1,000. New York Giants fans would have to watch the team only on defense. MULTILINGUAL DAY-TRADING DEVICE -- Stock traders rely on company news releases to make important investing decisions, but the traders aren't always fluent in business-speak. This intelligent hand-held device would translate it into English. For example: "The Silikon Corporation today announced its fifth consecutive quarter of negative earnings growth. It is amid aggressive cost-cutting efforts -- including realigning head-count moves -- that, coupled with cooperative macroeconomic forces, should ensure a healthy return on investment. The company is a leading maker of cutting-edge technology in the evolving e-commerce market." Translation: "We lost money, again. Please buy some of our furniture so we can survive until August. We don't have a product." MR. THERMOSTAT -- Bill Gates has the prototype at his Seattle mansion, which adjusts the temperature in each room automatically, based on its occupancy. But this technology could be even smarter if it accounted for social parameters. Favored friends would get a cool tropical breeze. Cold and hot could be used to drive out unwanted guests. Precipitation could drench antitrust lawyers. THE HIGHLY PERSONAL ORGANIZER -- There are few people, let alone devices, with whom you may feel comfortable getting into personal issues. What could be better than a portable gadget that you could really open up to? The Highly Personal Organizer would be totally at ease discussing both scheduling and emotional issues. (Device: "It's your mother's birthday. Do you want to talk about why you haven't called yet?") The gadget -- possibly called the Interpersonal Organizer -- would have a nurturing user interface and could store 300 rationalizations. EPIPHANY ALARM CLOCK -- This clock with artificial intelligence would demonstrate not so much intellect but intuition. When you hit "snooze" in the morning, it would discern whether you really needed more sleep or were just procrastinating. In either case, the clock would call your office and bargain for more sleep time. THE TACT CHECK -- E-mail programs already help you determine whether your message contains correct spelling and grammar. But there is a larger question. This new smart e-mail program would help you decide whether you should send the message at all. The device would excise romantic overtures in which you try too hard, cloying letters to your boss and insincere messages in which you report that you have "negative earnings growth." http : // www.nytimes.com Load-Date: July 8, 2001 End of Document Opening Doors on the Way to a Personal Robot The New York Times

Time: 17/06/2002  
 "2001: A Space Odyssey". (Clip from "2001: A Space Odyssey") WILSON (voice-over): Back in 1968, it predicted human-like computers with artificial intelligence. (Clip from "2001: A Space Odyssey") WILSON (voice-over): What made Hal so special? PROF. DAVID STORK, STANFORD UNIVERSITY: Hal had things like speech recognition, natural sounding speech production, computer vision, language understanding, common sense, reasoning, this general field of artificial intelligence. WILSON (voice-over): Stanford professor and computer researcher David Stork is a leading expert on Hal's legacy. That's the title of his new book on the subject. STORK: The problems that we thought were hard turned out to be easy and the problems we thought were easy turned out to be hard. The simplest thing that a three or four-year-old child can do, understand language, recognize a dog from a cat and things like this are the ones that we're having the greatest difficulty with. WILSON (voice-over): In the film, Hal's mood turns from serene to murderous on a secret space mission he controls. STORK: Frank and Dave retreat to a pod and turn off the electronics confident that Hal can't hear them and they discuss whether to disconnect him and Hal can tell what they're saying by lip reading. It's technically called speech reading. I've been working on computer speech reading for about five years and we have a very, very good system, but it uses sight and sound to do better speech recognition than the normal acoustic kind. But Hal did it in silence and that is much harder. WILSON (voice-over): After the murders, the remaining astronaut starts disconnecting Hal's brain. (Clip from "2001: A Space Odyssey") STORK: When Dave opens the brain room of Hal, he uses a key, when he's just about to take Hal apart, and this is that key. (Clip from "2001: A Space Odyssey") WILSON (voice-over): Professor Stork also has a part of Hal himself -- the computer face plate. STORK: I have, as far as I know, the only extant piece of the set of "2001", that is, a piece of Hal, so to speak. There would be a clear glass dome here and a red light and if you look at it, it's about a third of an inch thick, thick aluminum, 24 little screws around here, beveled things. They could have done it paper mache, but they went through all this kind of detail. WILSON (voice-over): Stork says the computer world has met Hal's vision in a couple of important areas -- computer graphics and controlling some industrial production. STORK: We have computers that can run large factories, complicated airline registration systems and so forth. Control is not that hard. WILSON (voice-over): The human legacy of Hal, he says, is inspiration. STORK: I partially went into science because of the film. In fact, I'm sure that the first time I ever thought of a computer lip reading, speech reading, was from that film and now I'm a world expert on computer lip reading. Yes, it inspired, I think, a generation of future computer scientists in the way that Buck Rogers influenced the budding space and aerospace industries in the previous decade, in the 50s. WILSON (voice-over): Dick Wilson, CNN, Los Angeles. NELSON: Stanley Kubrick, the creator of the film "2001", is working on a new movie right now. It is called "Artificial Intelligence" and Arthur character. Clark, the author of the original book, has a new one out. It is called "3001: The Final Odyssey". Now, some news that's a little more down to earth. Let's go out to our tech desk in San Francisco for a look at the computer stories that made news this past week and standing by, CNN's Greg Lefevre. GREG LEFEVRE, CNN SAN FRANCISCO BUREAU CHIEF: Thanks, Brian. A big merger in the computer connection business was announced on Wednesday. 3Com Corporation, maker of computer networking products, is buying modem maker U.S. Robotics for $6.6 billion. The new company will serve a variety of customers, including big and small corporations, telephone carriers, Internet service providers and consumers. Shortly before the merger was announced, 28 communications equipment makers announced plans to develop a common standard for faster modems. But not included in the coalition was U.S. Robotics, which just began shipping its new 56 kilobit modem. A company spokesman says U.S. Robotics was not invited until just before the announcement of what is being called the Open 56K Forum. Major backers of the initiative are Rockwell, Lucent and Motorola. U.S. Robotics says it welcomes talks that would encourage a single standard. It's going to cost the Internal Revenue Service as much as $129 million to reprogram its computers to recognize the year 2000. Internal Revenue Service officials testified before the National Commission on Restructuring the IRS saying a fix to the year 2000 problem is the highest priority of the tax collecting agency. Well, employees at Lotus are in a mood to celebrate. Workers there popped the champagne and watched the first shrink wrapped copy of Smart Suite 97 come off the assembly line. The new version of the integrated business software package includes the famous Lotus 123 spreadsheet, WordPro word processor, Approach database and Lotus Organizer. And that's some of the computer news this week. From the tech desk in San Francisco, I'm Greg Lefevre. Brian, back to you. NELSON: Thank you, Greg. And just ahead, no service, no smile -- a look at the lack of technical support for some PCs once you get them home. (COMMERCIAL BREAK) NELSON: Are you fed up with the busy signals you're getting when you call tech support for your PC? Well, you're not alone. Surveys are suggesting that service is, indeed, getting worse, and, in fact, in one case, consumers even sued a manufacturer. Fred Katayama now with a look at the state of PC tech support. FRED KATAYAMA, CNN CORRESPONDENT (voice-over): Richard Brommel's (ph) Leading Edge computer has led to service nightmares. RICHARD BROMMEL: They sent me down all of these blind alleys and wild goose chases whereas it was pretty obvious to most people that I spoke to that the problem was in the chip itself. KATAYAMA (voice-over): He and two others have sued, charging Leading Edge with fraud and breach of warranty contracts. Plenty of PC users are frustrated. A survey by "Home PC" magazine found that users calling for service spend an average of 13 minutes on hold before reaching a support person, up from nine minutes the year before, and solving the problem took eight days, up from five and a half. Leading Edge finished last in support and reliability. Why the decline in service? ELLEN PEARLMAN, "HOME PC" MAGAZINE: There were a lot of PCs sold last year and the year before and a lot of them went to novices and those are people that need a lot of hand holding and they're going to call their tech support line and ask for help and frankly the PC companies were not staffed up to handle the load. KATAYAMA (voice-over): Recently, some manufacturers have begun charging for support, even under warranty, and they're offering support on line, but that won't help users who can't log on or don't know how. (on camera) As for Brommel's legal case, Leading Edge did not return our phone calls. Brommel found out it took just one part to fix it, a part that costs $40. (voice-over) Even so, he has since junked his PC for a different make. Fred Katayama, CNN Financial News, New York. NELSON: Stay with us. We'll be right back and we'll visit a galaxy far, far away. We'll stop at a Chinese cyber cafe and check out an on line option in France. (COMMERCIAL BREAK) LORI WAFFENSCHMIDT, CNN CORRESPONDENT (voice-over): With a look at what's on the net, I'm Lori Waffenschmidt. Check out the big screen on your computer screen. Starwars.com is where you want to be for the latest information on the re-released Star Wars trilogy and the upcoming prequels. You can go behind the scenes and count down the days to the release of "Return of the Jedi" or click on the names of the already re-released films to see just what is different about these legendary movies. You can even change the look of your favorite Star Wars character. Just click on that wookie, print him out and let your kids give Chewie a crayon die job. If seeing isn't believing, try listening, instead. Here, we found several links to sites filled with your favorite Star War sounds, or to more sites with sites, if that's what you prefer. There are any number of Star Wars sounds reverberating throughout the cyber space galaxy, so surf away. Alas, no one is perfect, even George Lucas, as evidenced by this list of bloopers from his film trilogy. Pick a movie and get a list of presumably all the mistakes contained in that particular film. That's what's on the net. I'm Lori Waffenschmidt. NELSON: Under the leadership of paramount leadership Deng Xiaoping, to whom the Chinese have just bade farewell, China has opened many new doors, some of them very cautiously, and one of those certainly was the Internet. Here with our report on that from Beijing is Rebecca MacKinnon. REBECCA MACKINNON, CNN CORRESPONDENT (voice-over): Edward Zeng is part of a new breed of Chinese techno businessmen. His concept, selling gourmet coffee along with free access to cyberspace. Zeng's Internet Cafe is just one part of his on line business, spanning from a travel information service to on line shopping and even import/export trading. EDWARD ZENG, SPARKICE, INC.: I think the Internet is a low cost, highly efficient new media. If you put your money into the Internet 24 hours a day to sell your products, it will be very effective once more Chinese companies discover it. MACKINNON (voice-over): That discovery is happening now. A hundred thousand Chinese now have Internet accounts, a tenfold increase in one year. (on camera) But for the Chinese cyber surfers, there have been some roadblocks. Just last August, the government decided to block access to more than 100 web sites, including CNN's. Now most general news sites are open again. Sites that feature pornography or politically sensitive topics like Tibet or Taiwan are not. (voice-over) But despite some censorship, Chinese companies are discovering the Internet as a tool for advertising and research. Even the government acknowledges that there's no holding back the information tide. YU XIAOMING, CHINA UNICOM: Years ago, we weren't allowed to listen to foreign radio broadcasts, so you have to look at the long- term. MACKINNON (voice-over): As more Chinese companies and government ministries compete for a share of the profits, observers say the result will be less control. STEPHEN GUERIN, REDFISH GROUP: Now is when it's starting to get very exciting and very, more, more chaos is coming in the marketplace and so it gets tougher to say which network is going to take over or what the amount of control is going to be because you have market forces. MACKINNON (voice-over): One thing at least is clear, the Internet in China is here to stay. Rebecca MacKinnon, CNN, Beijing. NELSON: Well, the French are extending their reach into cyberspace. The latest involves taking bids over the Internet. And up for grabs, a collection of letters and documents pertaining to the Dreyfuss affair which rocked the French military establishment in the 1890s. From Paris, Peter Humi with a report on an experiment that seems to have worked. PETER HUMI, CNN CORRESPONDENT (voice-over): Two months in the planning, but less than a day to install. The Dureaux Auction House left it a little late as engineers and technicians armed with plugs, monitors, phones and cables make frantic last minute efforts to make sure all was connected. Forty minutes behind schedule, the sale started. Eighty pre-selected bidders around the world participated via Internet, two sophisticated digital cameras keeping them and an estimated 10,000 other surfers connected with live pictures from Paris. Most of the lots went to bidders in the auction room itself. As for the auctioneers, selling over the ether didn't seem to pose a problem. The most important thing for an auctioneer is to sell at the highest price, said Jean Claude Benache. I don't mind if I don't see my clients, he added, as long as I see their money eventually. In the end, of the 141 documents, letters and contemporary media reports of the Dreyfuss affair, only 10 were purchased via the Internet, the majority in Japan. Sold, the lot is us, said the inscription on the web site. (on camera) The sale raises some interesting legal and fiscal questions, however, the answers to which may affect more than just auctions on the Internet. (voice-over) The stringent laws which control such sales in France do not, as yet, take the Internet into account. ANTOINE BEAUSSANT, NART: We consider that the auction room is wiring itself through the whole Internet. HUMI (voice-over): Winding through and legally sidestepping the rules of selling at a distance. Lawyers for Dureaux established an important precedent -- the Internet surfers considered in this case as technically just placing orders, as opposed to bidding, e-mail orders, as it were. Peter Humi, CNN, Paris. NELSON: Coming up next on the CNN COMPUTER CONNECTION, music software that lets you relive a legend or make one of your own and a genie to guide you in creating Internet applications. (COMMERCIAL BREAK) NELSON: Well, the mantra of the web these days seems to be more and more interactivity and users themselves, what do they want? More creativity? Well, Joan MacFarlane now reports on an Internet character that may make both wishes come true. JOAN MACFARLANE, CNN CORRESPONDENT (voice-over): Cruising the Internet can be a lonely ride. There is plenty to see, but you rarely encounter anything worth listening to, until now. Meet the genie. He is an animated character that can fully interact with the user. DOV WEIZMAN, ARGO TECHNOLOGIES: That teacher that has the conversational character that has both the ability of speech, animation and voice recognition, elevates the whole thing into a higher level. You suddenly personalize the machine. The Internet becomes a person that talks to you. MACFARLANE (voice-over): Dov Weizman of Argo Technologies has developed a web site where users and programmers can learn how to use the technology on line. (on camera) Now, don't expect to find the genie in your local computer store because the software that controls and creates him is still in the test phase. It's made by Microsoft and it is only available on the Internet and at least for now, you can download the software for free. (voice-over) The Microsoft program is called Agent and it allows programmers like Weizman to create Internet applications using conversational characters like the genie. Weizman has simulated an on line bank program where the genie helps customers get through their banking tasks with ease and humor. The software will eventually allow users and programmers to create their own characters. So some day, surfing the web could be done with a friend. Joan MacFarlane for CNN, Ann Arbor, Michigan. NELSON: If you want to check out the genie yourself, you can do so. The address is www.argolink.com. Well, musicians, did your band miss out a shot at the Grammy award? You have to break into the business first, though, before you can win this golden phonograph. Dennis Michael now takes a look at a new program designed to give you a shot at stardom and some other software for music lovers in this edition of our tech guide. DENNIS MICHAEL, CNN CORRESPONDENT (voice-over): So you want to be a rock and roll star? You have to break into the biz first. The garage band CD-ROM might just help you get your foot in the door. Hailing itself as the definitive guide for career-minded musicians, this program advises on everything from booking gigs to contract negotiation. Rock and roll legends never die, they just release multi-media retrospectives. Carlos Santana is the latest legend to join the digital age. The River of Color and sound is a fascinating look back at the over three decades long career of this music icon and the more than 30 albums to his credit. If you have 30 albums or even 300 albums to your credit, or, rather, in your collection, then maybe it's time you organized them. Media Base 1.0 for Windows does just that. What it lacks in terms of visuals is made up for with its highly organizational properties. Media Base 1.0 is available on the web at www.collectivebass.com. I'm Dennis Michael with the tech guide. NELSON: And on that note, we're going to call it a day. Thank you for joining us on today's edition of the CNN COMPUTER CONNECTION. I'm Brian Nelson. Load-Date: March 1, 1997 End of Document Interview With Barry Vacker CNN CNN LIVE SATURDAY 12:00

Time: 27/09/2009  
the Woodstock Film Festival celebrates its 10th anniversary this week, it plans, as usual, to recall the music festival of 1969 that gave it its name. But this year, the limelight will be on the era that is to come -- and a movement called Transhumanism, which supports the use of technology to improve the human condition. ''We are on the cusp of a new decade, all of us, so a lot of our focus will be looking at the future,'' said Meira Blaustein, executive director and co-founder of the film festival. A highlight will be a panel discussion, ''Redesigning Humanity -- The New Frontier,'' featuring scientists and ethicists. One panelist, Raymond Kurzweil, is an author and trailblazer in the field of artificial intelligence; another, Martine Rothblatt, began the first satellite radio company and is active in bioethics, gender freedom and antiracism causes. Other panels at the festival, which is to run from Wednesday through Oct. 4, will consider the future of film distribution and of independent filmmaking. In the world premiere of ''2B,'' directed by the Emmy Award-winner Richard Kroehling, the focus will be on the challenge of the biotech revolution. And the feature-length pilot of ''Caprica,'' a new series on Syfy (formerly known as the Sci Fi Channel), introduces two rival families competing in a powerful society with technology decades ahead of the 21st century's, on the brink of collapse. The connection between the Woodstocks (music festival and film festival) is celebrated annually, not just because of a shared name, but because of a shared laid-back atmosphere. This year, many of the films seem especially attuned to the music festival held at Bethel 40 years ago. Jonathan Demme's latest entry, ''Neil Young Trunk Show,'' paints an intimate backstage portrait of the musician; ''When You're Strange,'' Tom DiCillo's documentary about the Doors, is narrated by Johnny Depp and, according to the director, features never-before-seen footage; and Barbara Kopple's ''Woodstock: Then and Now'' will be given a special screening on Wednesday night, followed by a question and answer session with Ms. Kopple and Michael Lang, the concert producer who helped create Woodstock '69. In keeping with its position that it is ''fiercely independent,'' the festival also champions small films, like ''Redlight,'' about child sexploitation in Cambodia, produced and narrated by the actress Lucy Liu; and ''Eyes Wide Open,'' an Israeli film about a gay love affair in an ultra-Orthodox Jewish community in Jerusalem. ''Some of these films take on very challenging subjects, from the taboo and the hushed to the difficult, in an unflinching but elegant manner,'' Ms. Blaustein said. ''Our pride and joy are the smaller films. We try hard to get them the attention they deserve.'' For more information about the festival lineup and tickets, visit woodstockfilmfestival.com. http : // www.nytimes.com Graphic PHOTO: ''2B'': Jane Kim stars in a film set in a future New York. Load-Date: September 27, 2009 End of Document What Is Artificial Intelligence? The New York Times

Time: 24/06/2012  
INFORMATION The Folklore of Computers and the True Art of Thinking. By Theodore Roszak. 238 pp. New York: Pantheon Books. $17.95. HELL, for Theodore Roszak, is a place where information takes the place of ideas, a corporate colossus of data processing companies floods the schools with small computers, video graphics pass for art and bit manipulation passes for thinking. Needless to say, we're almost there. ''There may soon be no one left in the high-rise ziggurats of our cities but a small elite of top-level decision makers surrounded by electronic apparatus,'' Mr. Roszak writes. ''They will be in touch around the globe with others of their kind, the only decently paid work force left in the information economy, manipulating spreadsheets, crafting takeover bids, transferring funds from bank to bank at the speed of light, arranging 'power lunches.' '' Mr. Roszak, a social historian with a longstanding distaste for the excesses of technology, takes on the computer in ''The Cult of Information.'' He confesses at the outset that he wrote the book on a word processor and researched it with the help of electronic data bases, and he hopes that the computer - if kept in its place -''may yet become a reasonably valuable public servant.'' But he fears otherwise. As his readers know from books like ''The Making of a Counter Culture,'' Mr. Roszak is a vigorous, mordant and persuasive writer, and he has an unusually broad command of both literature and popular culture. In his latest book he surveys attitudes toward data processing that run from Melville's ''Bartleby the Scrivener'' to Kurt Vonnegut's anti-utopian novels of the future. He gives a provocative sightseeing tour of the philosophies of Descartes, the Benthamite utilitarians and the information theorist Claude Shannon. He warns of many genuine dangers that computers bring modern society: efficient invasion of privacy, overreliance on polling in politics and, perhaps most seriously, abdication of control over military decision making. Furthermore, those selling the computer revolution - ''the hackers and the hucksters,'' as Mr. Roszak repeatedly calls them - have provided some fat targets. Artificial intelligence has been hyped and oversold, as most computer scientists now realize. Most of what now sells as artificial intelligence is a species known as ''expert systems,'' complicated hierarchies of rules that capture none of the creativity of real thought. Also, Mr. Roszak notes a good deal of confusion about the proper role of computers in education. As he points out, most students really have no need to learn to program a computer, unless acquiring that skill is done for the sake of familiarity and demystification, like learning a little bit of automobile repair. BUT Mr. Roszak goes beyond debunking. His vision of the computerized society becomes astoundingly apocalyptic, and even the most confirmed hater of bits and bytes will find some of his fears hard to take seriously. Is it true that ''some people relish the image of schools where ranks of solitary students in private cubicles sit in motionless attendance upon computer terminals, their repertory of activities scaled down to a fixed stare and the repetitive stroking of a keyboard''? Or that ''the computer makers have a vested interest in the technological unemployment of willing and available teachers''? Mr. Roszak believes that the availability of vast, hard-to-assimilate quantities of electronic information - the ''data glut'' - is not only harmful, but also part of a deliberate ''strategy of social control'' imposed by governments and interest groups on a naive citizenry. He also believes, quite seriously, that LSD (''itself a technology'') and rock music caused many young people to fall for the ghastly idea that small computers could be democratic and funky. Unfortunately, he cannot credit the notion that other people - scientists, educators and even high school hackers - might be capable of using their computers the same way he uses his: as aids to intelligence. Graphic Drawing End of Document New U.S. Research Aims At Flood of Digital Data The New York Times

Time: 16/10/2011  
Mirror Worlds Or the Day Software Puts the Universe in a Shoebox How It Will Happen and What It Will Mean By David Gelernter Illustrated. 237 pages. Oxford University Press. $24.95. The prospect that David Gelernter describes in "Mirror Worlds" sounds like a late 21st-century science-fiction fantasy. "You will look into a computer screen and see reality," he writes in his prologue. "Some part of your world -- the town you live in, the company you work for, your school system, the city hospital -- will hang there in a sharp color image, abstract but recognizable, moving subtly in a thousand places. This mirror world you are looking at is fed by a steady rush of new data pouring in through cables. It is infiltrated by your own software creatures, doing your business." Yet the fulfillment of this prospect does not lie a hundred years in the future, Mr. Gelernter says; it is going to happen very soon. In a concluding summary, Mr. Gelernter, who teaches computer science at Yale and is an expert on artificial intelligence, writes: "If we had the luxury of devoting ourselves to full-time mirror-worlding, we'd have a complete prototype in a year or two. One way or another, we or some other research group will almost certainly have produced a full-fledged, large-scale mirror world by the end of the decade." Moreover, he explains in concrete detail that a nonexpert can easily understand just how mirror worlds are going to come into being. He begins by defining the tricky concept of what computer software is: "The program text -- the words and symbols that the programmer composes, that 'tell the computer what to do' -- is a disembodied information machine. Your computer provides a body." He goes on to describe how computer programs work, what a simple one looks like and how the high volume of data feeding a mirror world would demand that huge programs be broken down into "asynchronous ensembles," or groups of independent information machines working together. These infomachines, as he calls them, are basically what all nature and mankind employ, because when you stop and think about it, "physical, chemical, biological and sociological systems are virtually all asynchronous ensembles of one kind or another." And he handles these highly abstract concepts with some flair. Describing the way information is processed by a "trellis," a kind of program that makes the connection between external data and internal mirror reality, he writes: "A pounding rush of data thunders into the machine; to sight down a trellis from the top is to stand on the upper roadway seeing, hearing and feeling the spillway at the base of a concrete dam, billowing mist. This outpouring of raw numbers is tamed and transformed, as it flows upward, into the nuanced silence of a carpeted room." So he makes it easy to imagine how you could sit in front of your computer, select a mirror world, zoom in and poke around, like an explorer in a miniature submarine. "You can see traffic density on the streets, delays at the airport, the physical conditions of the bridges, the status of markets, the condition of the city's finances, the current agenda at city hall and the board of education, crime conditions in the parks, air quality, average bulk cauliflower prices and a huge list of others." Of course, some readers are not going to be thrilled by this prospect, and Mr. Gelernter is aware of them. To those who may worry about security and privacy he offers assurances that information within a mirror world will be as safe as it would be in a good real-world security system. And to those who dread that they may become too dependent on their computers he responds that mirror worlds are going to happen no matter what. The programs that will run them are the logical solution to gaining control over huge systems like air traffic or roadway networks that now threaten to engulf us. In fact mirror worlds may even embrace artificial intelligence, if, as Mr. Gelernter evidently suspects, mind is based on a vast storehouse of memory and not on "a dense intertwined superstructure of categories, rules and generalizations, with the odd specific, particular fact hanging from the branches like the occasional bird-pecked apple." Mr. Gelernter is studiously playful. He observes that while the point of designing good software is to solve a hard problem, some of the best software being produced today is "applied art," because art requires discipline. "You can't push if nothing is pushing back. . . . You can offend people, sure, but you can't surprise them. . . . Technology, on the other hand, still pushes back." In short, whether or not the prospect of mirror worlds pleases you, this is a highly edifying book on the whole world of computers. For anyone who has wondered what the next stage of the computer revolution will be like and how it will enrich our lives considerably more than the availability of word processors and calculators has, "Mirror Worlds" offers some answers. It tells you how Hamlet's dream may be fulfilled: "I could be bounded in a nutshell, and count myself a king of infinite space." Even more grandly, it permits you to imagine ways of negotiating the great metropolis without ever losing your temper or being mugged. Graphic Photo: David Gelernter Load-Date: December 19, 1991 End of Document New Economy; To handle complexity,computer researchers look to the self-regulating human body as a model. The New York Times

Time: 23/05/2005  
millennium is close upon us, and science and technology are not going to have it easy. There have been polemics against scientific inquiry and technological advances -- Luddite arguments made by critics like Kirkpatrick Sale and maniacs like the Unabomber. There have also been utopian fantasies about the powers of technology and science, asserting that human consciousness is about to be transformed just because the Internet allows computers to link to each other at 28,800 baud, or that life as we know it will be altered by advances in artificial intelligence or biotechnology. These are old fears and older hopes, going back to the dawn of the machine age itself: offering versions of hell, belching fire and destruction, as well as visions of heaven, as humanity is remade in a divine image. But in the midst of this millennial fever, two new books have taken a sober view of technological promise and scientific exploration. They are neither hostile nor celebratory, but seem subsumed by a tragic realism. We are left with neither hell nor heaven, but a flawed, rutted earthly landscape. In a provocative new book, "The End of Science," (Addison-Wesley Publishing) John Horgan, a senior writer for Scientific American, sees science fast approaching its conclusion, with lots of depression along the way. Science is usually portrayed as an infinite path to absolute knowledge in which important work is still continuing apace. The physicist Stephen Hawking and the mathematician Roger Penrose have been on the best-seller lists with their speculations about the cosmos and consciousness; theories of artificial life and artificial intelligence attract new generations of researchers; Darwinism continues to inspire controversy. But in a series of interviews with some of today's most brilliant scientists, Mr. Horgan finds an atmosphere of anxiety and melancholy, and a tendency for them to engage in fantastical speculation, without much acknowledgment that "the great era of scientific discovery is over." All that is left is some "mopping-up" exercises, filling in the holes in already established theories. Scientists cannot really have what they want; they already have it. "Just as lovers begin talking about their relationship only when it sours," Mr. Horgan writes, "so will scientists become more self-conscious and doubtful as their efforts yield diminishing returns." And that spirit has passed into the public realm as well. Science is attacked for being irrelevant, speculative and expensive; and, Mr. Horgan contends it often is. "One can find discussions of time travel, teleportation and parallel universes in reputable, peer-reviewed journals," Mr. Horgan writes. It is no wonder that contemporary critics have been chiseling away at scientific claims of truth and objectivity, his book implies. Scientists themselves are paving the way. Meanwhile, Edward Tenner, a historian of technology and a former book editor, argues in "Why Things Bite Back: Technology and the Revenge of Unintended Consequences," (Alfred A. Knopf) that we have finally come to understand the limits of technology as well. It is not evil, but neither does it promise unfettered progress. Mr. Tenner poses an inviolate law: technology designed to solve one problem ends up creating another or undoing its own solution. For every technological action, one might say, there is an equal and opposite reaction: technology's revenge. When more sophisticated protective helmets and pads were developed for football players, for example, a sense of invulnerability caused more aggressive play and more serious injuries. When computers promised to deliver an electronic office, instead they created a boom for the paper business. When eucalyptus trees were introduced in California to replace lost forests, they created an urban fire hazard. Technology will never solve our problems, because it always creates new ones. "Revenge effects," Mr. Tenner writes, "mean in the end that we will move ahead but must always look back." Engineers have not been volubly upset over Mr. Tenner's cautionary analyses. (Many social scientists, in fact, are now arguing that there are similar unexpected consequences to the most well-meaning social policies). This "revenge" factor may be no more than an example of complex systems at work: when we alter one element slightly, large and unexpected variations can occur. But many scientists have been in an uproar over Mr. Horgan's statements. Argument has already found a home on the World Wide Web , where Hotwire held a week-long debate between Mr. Horgan and a biologist, Stuart Kaufmann, (http:// www.hotwired.com/braintennis/96/ 25/index0a.html), who has been trying to examine why sophisticated organisms and systems evolve out of systems that would ordinarily tend toward entropic decay. Mr. Horgan suggests that much of the science being done is more like literary criticism and science fiction speculation than a quest for truth, while Mr. Kaufmann asserts that there is much exciting work going on and Mr. Horgan "will say anything to sell a book." Surfers add to this argument with threads of their own. Mr. Horgan takes note of many of the objections to his position: that a century ago science was also being proclaimed near completion just before relativity and quantum physics appeared; that current research in intelligence, complexity, evolution and cosmology also show how much work needs to be done; that any sudden discovery of, say, extraterrestrial life, could instantly transform the scientific scene. However, he insists that there is something different about the kinds of scientific work being done today because so many important discoveries have already been made. In fact, Mr. Horgan and Mr. Tenner have called the notion of progress into question. Neither scientists nor technologists have what they want. Contemporary science, in these portraits, seems trapped in a world that cannot hope to match the glories of the past and is uncertain about the future. This is a world of limits and limitations. And though it may be more difficult to live in, it might, in the long run, be more interesting that the apocalypses and utopias being brewed by millenarians. Graphic Drawing Load-Date: August 19, 1996 End of Document Glum Teenager Flies Pink-Painted Coop The New York Times

Time: 14/05/2013  
 University of California, Berkeley, M.S, 1979 and Ph.D., 1982 Other Facts: Was a member of President Barack Obama's Council of Advisors on Science and Technology. Serves on the boards of many organizations, including the Broad Institute and the board of trustees at the Mayo Clinic. Timeline: 1983-1997 - Works for Sun Microsystems, Inc. February 1994-March 1997 - Serves as chief technology officer for Sun Microsystems, Inc. April 7, 1997-2001 - CEO of Novell, Inc. March 2001 - Is named chairman of Google. August 2001-April 2011 - Serves as Google CEO. Schmidt receives a $100 million package as outgoing CEO, which marks the first stock-based compensation that he has received since he took over as Google's CEO in 2001. 2006 - With his wife Wendy, establishes the Schmidt Family Foundation to promote sustainability through environmental preservation, science and education. 2007 - Inducted into the American Academy of Arts and Sciences as a fellow. 2010 - Co-founds venture capital firm Innovation Endeavours. April 4, 2011-October 2015 - Executive chairman of the board of directors at Google. January 7-10, 2013 - Schmidt travels to North Korea with former New Mexico Governor Bill Richardson on what is described as a humanitarian mission. February 4, 2014 - Google reveals that Schmidt will receive $106 million in bonuses based on the search giant's 2013 performance. May 4, 2014 - "The New Digital Age: Transforming Nations, Businesses, and Our Lives," co-written with Jared Cohen, is published. September 23, 2014 - "How Google Works," co-written with Jonathon Rosenberg, is published. August 10, 2015 - Google announces a corporate restructuring, forming an umbrella company called Alphabet and naming a new CEO to the core business of Google. Schmidt will become Alphabet's executive chairman. October 2015-December 2017 - Executive chairman of the board of directors of Alphabet. March 2, 2016 - Secretary of Defense Ashton Carter announces that Schmidt is being appointed head of a new Defense Innovation Advisory Board, in an effort by the Pentagon to better address and enhance technology within the Department of Defense. December 21, 2017 - It is announced that Schmidt is stepping aside as executive chairman of Alphabet. He will remain on the board and continue to serve as a technical adviser. February 5, 2018 - The Massachusetts Institute of Technology announces that Schmidt will join MIT as a visiting innovation fellow for one year. January 2019 - Schmidt is selected as chair of the 15-member National Security Commission on Artificial Intelligence. April 30, 2019 - Alphabet announces that Schmidt will step down from its board of directors in June. March 25, 2021 - With his wife Wendy, gives $150 million to the Broad Institute of MIT and Harvard to launch the Eric and Wendy Schmidt Center. The center will focus on the "intersection of data science and life science, aimed at improving human health." February 16, 2022 - Schmidt Futures announces the launch of the philanthropic project "AI2050." With his wife Wendy, Schmidt plans to invest $125 million across a 5 year period towards artificial intelligence research. CNN Editorial Research TM & © 2023 Cable News Network, Inc., a Time Warner Company. All rights reserved. Load-Date: May 14, 2023 End of Document Eric Schmidt Fast Facts CNN Wire

Time: 14/01/2006  
went to the Consumer Electronics Show in Las Vegas last week for two main reasons: to speak on a panel about next-generation gaming and to see if Sony would say anything substantive about the PlayStation 3. The panel was over by the end of my first morning in town. By the end of the second morning -- after Sony's news conference and a speech by Sir Howard Stringer, its chairman -- it was clear that the company was intent on saying absolutely nothing significant about the PS3. (So by default, the prevailing assumption for now has to be that North American gamers won't see the machine before November; Japan will get first dibs.) The rest of the show didn't have a lot of video-game content. And so, faced with two more days before my flight out, I went looking for what so many have sought in Sin City: sex. And that's because gadget geeks aren't the only folks who have their major annual get-together in Las Vegas during the first week of January. Quite symbiotically, it seems, the multibillion-dollar sex entertainment industry stages the flashy Adult Video News Adult Entertainment Expo at the same time. That got me thinking about the debate that erupted last year when it was discovered that Grand Theft Auto: San Andreas included hidden scenes, playable only with special software, that used relatively low-resolution graphics to depict mostly clothed digital figures rubbing against each other in sexlike poses. That revelation not only made news across the country, but also propelled Democratic senators, led by Hillary Rodham Clinton of New York, to introduce legislation that would have the Federal Trade Commission regulate video game sales. With sex in video games such a hot topic, I figured that the professional pornographers must be working on some pretty-far-out game projects. And so, with the full consent of my girlfriend, I went in search of the latest video games with sexual content. The first thing I realized was that there still aren't any true ''adult'' video games, as the industry calls them. By that I mean that I have never seen a product that worked primarily as an engaging video game while also incorporating X-rated content in an interesting way. Even as far back as the 1980's, the really good games with risque themes, like the Leisure Suit Larry series and the text-only Infocom classic Leather Goddesses of Phobos, had very little actual sex in them. Instead, they relied on humor and innuendo. On the other hand, almost all sex-oriented games have just been straight-up pornography strung together with a veneer of interactivity. As far back as junior high school in the 80's, I can remember strip poker games for my Commodore computers that amounted to barely decipherable digital pictures of topless women with a few card-flipping animations thrown in. Twenty years later, the graphics and presentation are a lot better, but the idea is still mostly the same. For example, one of the highest-profile interactive products in Las Vegas last week was a DVD called Virtual Blackjack with Gina Lynn, due out this month. Evan Brimstone, the project's producer, said he worked for 18 months trying to shoehorn a playable blackjack system onto a DVD. As the player wins hands, Ms. Lynn performs various explicit scenes. The challenge facing the industry is that for any video game to break through, it really has to deliver on the game part. Otherwise, the player might as well go straight for the hardcore stuff readily available all over the Internet. Ms. Lynn seemed to perfectly grasp that the play, not the sex, is the thing. ''With a movie they don't have to work for it,'' she said, stepping away from an autograph session with fans. ''But in the game you don't get to see anything unless you win. With a game they feel like they accomplished something and they win a prize, and the prize is me. They can watch any movie just to see sex. But with a game they get to feel like they've won, and hopefully that keeps them playing.'' In the end, though, most of the games out there with sexual content are still just a matter of picking a path to follow. It is a problem familiar to Joone, founder of Digital Playground, a leader in interactive pornography since the early 1990's. Digital Playground started the popular Virtual Sex DVD series, which has included big-name porn stars like Jenna Jameson, Tera Patrick and Jill Kelly, and is now beginning to stream explicit clips to video iPod users. ''When the DVD came out it actually became harder to achieve the interactivity because with the DVD you couldn't save,'' said Joone, who uses only one name. ''You could switch camera angles and you could switch positions, but you couldn't save your experience and play it back.'' Now, with high-definition movie formats like HD-DVD and Blu-ray on the way, Joone said he hoped that the industry could create new interactive features that allowed users both to create and to save their preferred path through a film or scene. But why no real video games with sexual content on real video game systems? In the end, it is mostly because the big-name console makers are afraid of the potential backlash. While anyone can make and sell a PC game, selling a game for a living-room console requires approval from the system's manufacturer. ''We thought we would be building bigger, more sophisticated games by now like you see on PlayStation and Xbox,'' Joone said, ''but the problem is that Sony and Microsoft are the gatekeepers and they don't want it. Also, we know a lot of users would like our content on a PSP, but Sony controls that and they say that if it's hard core it's not going on the PSP. You can do soft core only.'' But despite all the warmed-over concepts, there were a few flashes of real creativity. The most interesting project I saw was a demonstration of a massively multiplayer online game called Naughty America: The Game. The graphics, which looked a lot like the Sims game, were nothing special, but the concept was fascinating: to bring together gaming and online dating. Dusty Lillo, a Naughty America spokesman, said the game was not meant for immediate sexual gratification. ''This is for people who want to form relationships,'' he said. ''This is for people who want to explore their fantasies.'' ''In World of Warcraft, you go up in levels, gain power and add equipment,'' he added. ''In our game, you add prestige by having sex with more people. But you can't tell other people who you had sex with unless both parties agree to share that information publicly.'' Mr. Lillo said the game, which is scheduled to go into online beta testing this spring, will include a strong identity-verification system. And he joined the politicians and others who have denounced Grand Theft Auto. ''Grand Theft Auto is marketed to children, and in that game you can beat women without their consent and that is unacceptable,'' he said. ''In our game you can't have sex with someone unless it's consensual. In our game, if someone doesn't like what you're doing, they can tell you to stop.'' ''Previous games with sex involved artificial intelligence, but who wants to have sex with an artificial intelligence, with a machine?'' Mr. Lillo added. ''People don't want to play games anymore unless they know there are real people on the other end. What we're doing is using a game system as the bridge to online dating. Most online dating now is on Web sites, and Web sites are so static. This is an interactive environment with a game component that lets people, men and women, actually meet each other and explore their fantasies consensually before exchanging any personal information.'' Don't be surprised if the idea works. Sex sells. Online gaming sells. Online dating sells. If Naughty America can meld the three into a workable system, perhaps then there will be an ''adult'' video game. As usual, responses are invited to thegamer@nytimes.com. http : // www.nytimes.com Graphic Photo: Gina Lynn at the Adult Entertainment Expo in Las Vegas. (Photo by Ethan Miller/Getty Images) Load-Date: January 14, 2006 End of Document Code-Writing Pioneers, It’s Your Turn; Movie Review The New York Times

Time: 17/05/2009  
Olivia Selfridge Rissland and David John Knezevic were married Saturday in Lincoln, Mass. The Rev. Roger W. Paine III, senior minister of the First Parish Church at Lincoln, performed the ceremony in his church. The bride, 26, and the bridegroom, 27, met as Rhodes scholars at Oxford, where each received a doctorate, she in biology and he in computational mathematics. They are doing postdoctoral research at the Massachusetts Institute of Technology, where she is a molecular biologist at the Whitehead Institute and he is an applied mathematician in the mechanical engineering department. Dr. Rissland, who is keeping her name, graduated magna cum laude from Brown and is the daughter of Edwina L. Rissland of Belmont, Mass., and the late Oliver G. Selfridge. Her mother is a computer science professor at the University of Massachusetts, Amherst, where she is also a specialist in artificial intelligence. The bride's father was an innovator in early computer science and artificial intelligence. He was affiliated with the Lincoln Laboratory at M.I.T., and later became chief scientist for GTE. The bride's paternal great-grandfather, H. Gordon Selfridge, was an American who founded the Selfridges department store in London. Dr. Knezevic graduated from the University of Western Australia in Perth with two bachelor's degrees, one in engineering and the other in computer and mathematical sciences. He is a son of Beverley Knezevic and Dr. Wally Knezevic of Perth, Australia. His mother is a supervisor of student teachers in the department of education at the Edith Cowan University campus there. His father is a neurologist in Perth. http : // www.nytimes.com Graphic PHOTO (PHOTOGRAPH BY MATT GRAZIER) Load-Date: May 17, 2009 End of Document I.B.M. Computer Program to Take On 'Jeopardy!' The New York Times

Time: 14/02/2011  
Sousan Azimi-Sanavi, a daughter of Touran Mollah-Jafari and Hussein Azimi-Sanavi, both of Teheran, Iran, was married yesterday to Thomas Evan Gass, the son of Mr. and Mrs. Manus G. Gass of River Edge, N.J., and Southampton, L.I. Rabbi David Greenberg performed the ceremony at the Gass home in Southampton. The bride, a computer consultant and programmer in international banking at Citicorp in New York, graduated from Queens College of the City University of New York and received a master's degree in artificial intelligence there. She is studying for a Ph.D. in artificial intelligence at the CUNY Graduate School and University Center in Manhattan. Her father owns the Rottermeyer Construction Company in Teheran. Her mother is a biochemical researcher. The bridegroom is a partner in Short & Gass, admiralty lawyers in New York. He graduated from Williams College and the New York Law School. His father is a former president of the Buitoni Foods Corporation and a former chairman of Perugina Chocolates and Confections U.S.A., both in South Hackensack, N.J. He has his own consulting company, United States Representative Services, in New York. The bridegroom's mother, Estella Gass, is a director of the Mid-Bergen Community Mental Health Center in Paramus, N.J. End of Document David L. Waltz, Computer Science Pioneer, Dies at 68 The New York Times

Time: 21/06/2012  
We expect technology in certain places. We even welcome it. Technology in the workplace? A given. At home in the living room? Awesome -- more movies to watch, more music to listen to, more games to play. When we're traveling? Also a boon. We gain a wealth of information, and therefore power, as we compare fares, rebook canceled flights and find taxis in strange cities at odd hours. But the kitchen has always been a minefield for technology. People have been talking about ''the kitchen of tomorrow'' since before the Eisenhower administration, and I suspect they always will. That's because the act of cooking holds different meanings for different people. It's science, on the one hand, but also an act of tradition, of artisanship and even of intentional imprecision that runs counter to the way most technology accomplishes things, in exact, measured ways. No doubt, there have been some hits when it comes to tech in the kitchen, but they are few and far between. The microwave oven seems to have secured its place on the countertop, but other appliances are not all that different from their predecessors of 50 or even 75 years ago. The last great innovation was the addition of a chilled water dispenser on the refrigerator. Recently I looked at three products that try to bring the digital age to the kitchen: a rice cooker, an iPhone-linked thermometer and a coffee maker that wants to put a Starbucks on your countertop. Are they more than just gimmicks? Do they improve the overall kitchen experience? Here is how they fared. RICE COOKER The necessary equipment for cooking rice is simple: a pot, some water, some rice. But in Asia, where rice cooking is generally done on a daily basis, the rice cooker has evolved into an extremely high-tech machine. On the top shelf sits the NP-HTC10 rice cooker ($400) from the Japanese manufacturer Zojirushi. While the simplest rice cooker is basically a small slow cooker, this model adds three features that are supposed to make rice cooking easier and better. The first is a microprocessor using fuzzy logic. Fuzzy logic is a mathematical concept developed in the 1960s and '70s that tried to account for ''degrees of truth,'' as opposed to true/false outcomes. The idea got a lot of attention in the ensuing years as one of the underpinnings for artificial intelligence and even deconstructionist literary theory, but these days those who are not mathematicians or computer scientists mostly hear about it in the context of consumer products, like rice cookers. With fuzzy logic, the Zojirushi's microprocessor can analyze the cooking conditions in the rice cooker and make on-the-fly adjustments. If the rice is cooking too quickly or too slowly, the heating element can be adjusted. Other parameters can be tweaked for short-grain, sushi-grade rice or medium-grain brown rice. The second bit of technology added to the Zojirushi is induction heating. There is no heating element to speak of; the whole bowl is the heating element. Using induction, the Zojirushi can provide even heat to the entire cooking area. The last piece of tech is pressurized cooking. The Zojirushi uses pressure to cook rice at higher temperatures, which can make for fluffier rice, and fluffy rice is huge in rice-cooker land. The end result? The Zojirushi made me feel as if I were an assistant to a great sushi chef. My rice came out perfect, every time. Nothing overcooked, nothing sticking. And thanks to the fuzzy logic, not only was my rice cooked perfectly, but the Zojirushi could keep it warm and soft for at least 24 hours. It's a small pleasure, to be sure, but a pleasure nonetheless (and since I'm the parent of a baby and a 6-year-old, rice is a big deal in our house). It's also a pleasure that can be had for far less than $400. While induction heating and pressurized cooking are nice, the main advantages of microprocessor-controlled cooking can be found in rice cookers by other manufacturers, like Panasonic's SR-DE103, for around $100. Even Zojirushi makes a model that is priced near $100. THERMOMETER The second product that is meant to bring the latest technology to the kitchen is iDevice's iGrill, an $80 wireless thermometer that can link up with a smartphone to display cooking temperatures. In theory, this is mildly useful; roasts or pork shoulders can cook while you do other things around the house, and your smartphone will alert you when your food is approaching the target temperature. But that is not terribly different from what a lot of standard remote thermometers can do, and they can cost as little as $20. The smartphone connects to iGrill through an iGrill app, which includes some added features like the ability to plot the food's temperature change on a graph (which can then be downloaded as a PDF or Excel-ready file, though who really does that?). In my test, the app was clunky, and it was not always clear that I still had a connection to the probe inserted into my food. For roughly the same money, I would rather have a Thermapen ($90), an instant-read thermometer that comes with a certification form verifying its accuracy to within a tenth of a degree. The Thermapen is simple to use -- just unfold the probe and stick it into whatever you want to measure the temperature of -- and is so accurate that I could see different temperature readings as the probe moved toward the center of my pork roast. COFFEE MAKER The last product I tested was arguably the most extravagant. Actually, it isn't even arguable; the Jura Impressa J9 is a $2,900 fully automatic coffee maker. Fully automatic means that water, coffee beans and milk go into various compartments of the J9 and the machine takes care of the rest. Select your drink and the J9 grinds (coffee snobs take note: it's a proper conical-burr grinder), tamps and brews the coffee, while also heating or steaming milk, if that's required. A full-color display shows a variety of coffee drinks you can select. The machine periodically rinses itself, so all you have to do is empty the bin of coffee grounds and clean the drip tray. It's a magnificent machine that turns any owner into a barista. But let's break this down for a second. The machine is $2,900. That $2,900 will buy you about 966 tall lattes at Starbucks. And that's not counting coffee beans, milk or sugar. But who am I kidding? If you're making these kinds of calculations, you're probably not the person who is thinking about buying a $2,900 coffee maker. That person is probably trying to figure out if it will fit in the Gulfstream G550. http : // www.nytimes.com Graphic PHOTOS: To bring the digital age into the kitchen, some companies are applying artificial intelligence to cooking rice and linking thermometers to smartphones. Clockwise from top, the iDevices iGrill thermometer, the Jura Impressa J9 coffee machine, the Thermoworks Thermapen thermometer and the Zojirushi NPHTC10 rice cooker. DRAWING (DRAWING BY JULIA YELLOW) Load-Date: June 21, 2012 End of Document Far Out: Studios Imagine Smart Cars for a World Transformed by Robots The New York Times

Time: 13/11/2006  
car that can drive itself is the fantasy of any designated driver, but the dream of owning a vehicle that does all the driving while you sit back and relax is one step closer to reality, as in-car artificial intelligence being developed by a team at Stanford University is ready to be used on city streets in the ultimate test of robot cars. Do you trust technology to make our everyday lives safer? If we say "we don't trust new technology" then that means don't read online news (internet).This new age civilization we live depend much on the technologies HUMANs created. We are the makers and we know its limits. If mistakes were commited, we can correct it. Giving our trust to a new tecnology in doing our daily task is like fitting in a new t-shirt. if its to fit change the size and you be confedent waering it. We have to accept that we are no longer rideing on horses but we must now what a car can do either good or bad. Matthew Angelo Tabalba IV, Cebu City, Philippines No! The "safer" we try to make the world, the more freedom we lose. It is the law abiding citizens who will suffer the most. How much of your personal freedom are you willing to give up in the name of safety. We could all live in isolated rubber rooms with 100 percent filtered air and water, perfectly portioned and nutritional bland foods, with some form of low impact stress free exercise and be safe - but completely insane due to boredom. As for trusting technology to make us safe, Hah! Have you seen "Terminator?" When our technology becomes too intelligent, we will no longer be needed. Jereme Schenerlein, Ohio, USA Yes! I trust our new age of technology to make our lives much safer and easy. Eds De la Cruz, Manila, Philippines Only to a certain extent will new technology makes our everyday life safer. For sure we will be able to change the world for the better. But, to be honest, I do not look forward to an even more robotic world with, for example cloning and genetic manipulation. That is going too far and nothing to do anymore with new technologies. Andrea, Germany Yes, I trust technology to make our everyday lives safer. Through nanotechnology we will be able to fight diseases before someone is even infected. Through artificial intelligence and the impending Singularity, our knowledge of the world and our access to information will be much more vast. We will be able to change the world for the better - as long as the religious fanatics don't hamper our Technological Progress. Henry George Wolf VII, Japan I do not look forward to a more automated robotic world...with cloning and genetic Frankenstein happening in labs right now. I do not look forward to globalism and the "one world" idea. I do not look forward to more urbanization and sprawl and the natural environment giving way to billions of people and their lust for everything and anything. I think we are going to research ourselves into extinction. With WMDs and now robots with artificial intelligence coming around the corner....why do we think we will survive? Our technology is growing faster than our social maturity and stability...not to mention morality. We'll kill the environment, have robots who run everything, and eventually have to have draconian laws on procreating because the planet will be so overpopulated and most people will either be eating genetically altered food or starve to death. Sharon Kirk, California, USA Load-Date: April 11, 2007 End of Document Eric Schmidt Fast Facts CNN Wire

Time: 10/10/2010  
SPIRITUAL MACHINES When Computers Exceed Human Intelligence. By Ray Kurzweil. Illustrated. 388 pp. New York: Viking. $25.95. ROBOT Mere Machine to Transcendent Mind. By Hans Moravec. Illustrated. 227 pp. New York: Oxford University Press. $25. WHEN THINGS START TO THINK By Neil Gershenfeld. Illustrated. 225 pp. New York: Henry Holt & Company. $25. Has the invasion already begun? Are the aliens already right under our noses? Are machines, the products of human engineering intelligence, poised to take over the world -- or is this an irrational fear, the latest spasm of the Luddite spirit? Finally, is the whole idea just a clever marketing ploy for the investment-hungry artificial intelligence industry? Here we have three books, all written by experts in computer intelligence, aimed to persuade us that the Age of Machines is nigh. We are to be eclipsed by our own technology, ceding our outdated flesh, blood and neural tissue to integrated circuits and their mechanistic progeny. The future belongs to the robots. The roots of this dystopian vision (or utopian, depending on your view) go back to a prediction made in the mid-1960's by a former chairman of Intel, Gordon Moore, that the size of each transistor on an integrated circuit will be reduced by 50 percent every 24 months. This prediction, now grandly known as Moore's law, implies the exponentially expanding power of circuit-based computation over time. A rough corollary is that you will get double the computational power for the same price at two-year intervals. Thus computers today can perform millions more computations per second than equivalently priced computers of only a few decades ago. It is further predicted that new computer technologies will take over where integrated circuits leave off and continue the inexorable march toward exponentially increasing computational power. The computational capacity of the human brain is only a few decades away from being duplicated on an affordable computing machine. Brains are about to be outpaced by one of their products. They are already being outdone in certain areas: speed of calculation, data storage, theorem-proving, chess. All three of these books provide a vivid window on the state of the art in artificial intelligence research, and offer provocative speculations on where we might be heading as the information age advances. Of the three, "The Age of Spiritual Machines," by Ray Kurzweil, is the best: it is more detailed, thoughtful, clearly explained and attractively written than "Robot: Mere Machine to Transcendent Mind," by Hans Moravec, and "When Things Start to Think," by Neil Gershenfeld -- though all three are creditable efforts at popularization. Since the books cover much the same ground, with some difference of emphasis, Kurzweil's gives you the most bits for your buck. Gershenfeld's breezily chatty book sometimes reads too much like an advertisement for the Media Lab at M.I.T., of which he is director. There is much discussion (and not a little hype) of his many achievements in harnessing computer technology to more physical concerns: electronic books, smart shoes, wearable computers, technologically enhanced cellos. Moravec's book is more intellectually adventurous and free with confident futuristic speculation. He envisages autonomous robot-run industries that we tax to siphon off their wealth, and the gradual replacement of organic humans with mechanical descendants -- our "mind children." His vision is of a world in which machines are the next evolutionary step, with organic tissue but a blink in the eye of cosmic history. Once intelligence is created by natural selection it will be only a matter of time (a very short one by cosmic standards) before the products of intelligence outshine their creators, finally displacing them altogether. This is good knockabout stuff, a heady and unnerving glimpse into a possible future. Where Moravec is weak is in attempts at philosophical discussion of machine consciousness and the nature of mind. He writes bizarre, confused, incomprehensible things about consciousness as an abstraction, like number, and as a mere "interpretation" of brain activity. He also loses his grip on the distinction between virtual and real reality as his speculations spiral majestically into incoherence. Kurzweil is more philosophically sensitive, and hence cautious, in his claims for computer consciousness; he develops the same kinds of speculations as Moravec, but with more of an emphasis on the meaning of such innovations for human life. He has an engaging discussion of the future of virtual sex once the technology includes realistic haptic simulations (what other bodies feel like to touch); here he envisages the eventual triumph of the virtual over the real. His book ranges widely over such juicy topics as entropy, chaos, the big bang, quantum theory, DNA computers, quantum computers, Godel's theorem, neural nets, genetic algorithms, nanoengineering, the Turing test, brain scanning, the slowness of neurons, chess playing programs, the Internet -- the whole world of information technology past, present and future. This is a book for computer enthusiasts, science fiction writers in search of cutting-edge themes and anyone who wonders where human technology is going next. But the question must be asked: How seriously are we to take all this breathless compuhype? Will the 21st century really see machines acquire mentality? There is naturally a lot of talk in these books about the possibility of machines duplicating the operations of the human mind. But it is vital to distinguish two questions, which are often run together by our authors: Can machines duplicate the external intelligent behavior of humans? And can machines duplicate the inner subjective experience of people? Call these the questions of outside and inside duplication. What is known as the Turing test says in effect that if a machine can mimic the outside of a human then it has thereby replicated the inside: if it behaves like a human with a mind, it has a mind. All three authors are partial to the Turing test, thus equating the simulation of external manifestations of mind with the reality of mind itself. However, the Turing test is seriously flawed as a criterion of mentality. First, it is just an application of the doctrine of behaviorism, the view that minds reduce to bodily motions; and behaviorism has long since been abandoned, even by psychologists. Behavior is just the evidence for mind in others, not its very nature. This is why you can act as if you are in pain and not really be in pain -- you are just pretending. Second, there is the kind of problem highlighted by the philosopher John Searle in his "Chinese Room" argument: computer programs work merely by the manipulation of symbols without any reference to what these symbols might mean, so that it would be possible for a human to follow such a program for a language he has no understanding of. The computer is like my manipulating sentences of Chinese according to formal rules and yet having no understanding of the Chinese language. It follows that mimicking the externals of human understanding by means of a symbol-crunching computer program is not devising a machine that itself understands. None of our authors even so much as consider this well-known and actually quite devastating argument. Third, to know whether we can construct a machine that is conscious we need to know what makes us conscious, for only then can we determine whether the actual basis of consciousness can occur in an inorganic system. But we simply don't know what makes organic brains conscious; we don't know what properties of neurons are responsible for the emergence of subjectivity. We would need to solve the age-old mind-body problem before we could sensibly raise the question of minds in machines. My hunch is that it is something about specifically organic tissue that is responsible for consciousness, since this seems to be the way nature has chosen to engineer consciousness; but that can only be a guess in view of our deep ignorance of the roots of consciousness in the brain. In any case, lacking insight into the basis of consciousness, it is futile to ask whether a machine could have what it takes to generate consciousness. Passing the Turing test is therefore no proof of machine consciousness: outside duplication does not guarantee inside duplication. This bears strongly on a practical suggestion of Kurzweil -- that during the course of the 21st century we might decide to "upload" ourselves into a suitable computing machine as a way of extending our lives and acquiring a more robust physical constitution. Let us suppose that the machine you choose to upload into passes the Turing test; it had better or else you would not wish to inhabit it. The problem is that it might do so without containing the potential for any form of consciousness, so that uploading your mind into it amounts to letting your mind evaporate into thin air.You will pass from sentient being to insentient robot. That is a lot to risk on the veracity of the Turing test! And it is no good hoping that the robots themselves will tell you whether they are conscious, since they will say they are -- whether or not they are. If people become convinced of the validity of the Turing test on mistaken philosophical grounds, then we might find ourselves in the position of unknowingly extinguishing our consciousness by uploading into machines that are inherently incapable of feeling anything. If Kurzweil is right when he says that machines that mimic the externals of human performance will become available sometime during the next century, then I suggest that the human race ponder the merits of the Turing test very carefully before taking any drastic steps. I for one would prefer sentient mortality to insentient immortality, or, more accurately, to the end of my self and the creation of an unconscious machine that merely behaves like me. Kurzweil, Moravec and Gershenfeld take it as a given that the mind is essentially a computer. The question then is just how powerful a computer the mind is and whether a machine could duplicate this power. But the authors do not think hard enough about their basic assumption. It is true that human minds manipulate symbols and engage in mental computations, as when doing arithmetic. But it does not follow from this that computing is the essence of mind; maybe computing is just one aspect of the nature of mind. And isn't this already obvious from the fact that many nonmental systems engage in computations? Silicon chips are not conscious, nor are the components of any future molecular or quantum computer. The fact is that minds are just one kind of computational system among many, not all of which have any trace of mentality in them. So computation cannot be definitive of mind. One aspect of mind wholly omitted by the computational conception is the phenomenological features of experience -- the specific way a rose smells, for instance. This is something over and above any rose-related computations a machine might perform. A DNA computer has biochemical as well as computational properties; a conscious mind has phenomenological as well as computational properties. These phenomenological properties have a stronger claim to being distinctive of the mind than mere computational ones. There is thus no reductive explanation of the mental in terms of the computational; we cannot regard consciousness as nothing but a volley of physically implemented symbol manipulations. And this means that there is no reason at all to believe that building ever larger and faster computers will take us one jot closer to building a genuinely mental machine. The fallacy here is analogous to reasoning that if a human body is a device for taking you from A to B, and a car also does this, then a human body is the same thing as a car. Minds compute and so do silicon chips, but that is no reason to suppose that minds are nothing more than what they have in common with silicon chips (any more than silicon chips are nothing more than what they have in common with minds). If our three authors are wobbly on the philosophy of mind and artificial intelligence, they are strong on computer technology itself; and here is where their books are particularly interesting. The reader can simply detach all the dubious speculations about machine consciousness and focus on the authors' predictions about the future of computer and robot technology, its potential benefits and hazards. Consider two examples of the kind of technology that might well be just over the horizon: the foglets and the nanobots. Foglets are tiny, cell-sized robots, each more computationally powerful than the human brain, that are equipped with minute gripping arms that enable them to join together into diverse physical structures. At ease the foglets are just a loose swarm of suspended particles in the air, but when you press a button they execute a program for forming themselves into an object of your choosing. We may come to live in foglet houses whose rooms are formed from the same foggy swarm. We may come to have foglet friends and take foglet vacations. Our entire physical environment may come to consist of a 3-D mosaic of cooperating microscopic computers. This would be virtual reality made concrete. Nanobots are devices for nanoengineering, the manipulation of matter on the atomic scale. They are also high-power microcomputers, equipped with manipulative skills and an urge to perpetuate their kind. They can make copies of themselves by following a program for nano-scale operations on chunks of surrounding matter. Imagine you start with 10 of them and that they can each make a copy of themselves in five seconds (they can do many millions of computations a second and their little mechanical limbs move, insectlike, with great rapidity). That means they double their numbers every five seconds, and an exponential nanobot population explosion is set to break out. These little blighters could consume the entire planet in a matter of weeks, including all the organic material on it! Nor would they be picked off by natural predators, being quite indigestible. In a very short time the nanobots will have razed everything in sight. Self-replication is perhaps the biggest hazard presented by advanced computer technology. Even today computers are routinely used to design other computers; in the next century they may be making computers that challenge humans in all sorts of ways. Victor Frankenstein refused to give his monstrous creation a bride for fear of their reproductive potential. Maybe we should be thinking hard now about the replicative powers of intelligent machines. If the 20th century was the century of nuclear weapons, then the 21st might be the century of self-breeding aliens of our own devising. http : // www.nytimes.com Graphic Drawing (Mirko Ilic) Load-Date: January 5, 1999 End of Document Seattle Taps Its Inner Silicon Valley The New York Times

Time: 25/11/2008  
depicted as the province of science fiction fans and mad scientists, robots are moving -- rolling, walking, crawling, flying, wriggling, hopping and creeping, to be precise -- into everyday life. Specialized mechanical robots are already in widespread use in manufacturing, medicine, law enforcement, exploration and other commercial applications. But what about personal robots? Two decades ago, the idea of personal computers appealed to only a relative handful of hobbyists. Today, PC's are a multibillion-dollar industry. If the dreams of some robot developers come true, recent advances in computer science, artificial intelligence and engineering, coupled with a growing consumer acceptance of electronic gizmos, may soon converge to create a personal robotics industry. Academic researchers, hobbyists and a few businesses are already thinking about the potential for veritable menageries of personal robots that can perform one or more domestic tasks, like mowing the lawn, vacuuming the floor, watering plants, serving drinks, delivering mail, feeding the pets, watching the house while the owner is on vacation (did you remember to unplug the coffeepot?) and helping disabled people do simple chores. At least one researcher envisions armies of cheap, simple microrobots that will scurry out from under the sofa at night, devouring dust and bugs, washing the floor, cleaning the windows and probably scaring the cat half to death -- unless, of course, the cat is also a robot. "It's kind of like where computers were 20 years ago," said Gregory Dudek, an assistant professor of computer science at McGill University in Montreal. "Today's robots are weird, kludgy things. But then, 20 years ago people bought computers that were also awkward to use. That's the sort of change we're looking for in the robot industry. I don't think it will happen in the next two years, but in the next 5 or 10 years, certainly." Who would not want a personal robot? "There's this wonderful thing about having something do what you tell it to do and act as if it were alive," said David P. Miller, technical director at the KISS Institute for Practical Robotics, an educational organization in Reston, Va. "We often ask kids to draw pictures of the robots they'd like to have, and they usually describe one that will clean their room, beat up their little brother -- you know, some task you would want a big servant to take care of." But instead of the hulking, mechanical tin cans that did the bidding of their mad scientist masters in yesterday's science fiction movies, tomorrow's personal robots are likely to be much smaller and look less like humans. With whirring motors, flashing lights and occasional beeps, small mobile robots are beginning to show up in schools, toy stores, gift catalogues and even a growing number of robot specialty shops. "Business has tripled in the last two years," said Mary Neitzel, manager of Mondo-tronics, a robotics company based in San Rafael, Calif. The company sponsors a series of popular robot exhibitions on the West Coast and has a Web site at www.robotstore.com. It used to sell expensive items like a solar-powered robot lawn mower -- the first order came from Lichtenstein, of all places -- but now Mondo-tronics sells only robot construction kits. While some might prefer to buy a working Little Brother Beater-Upper unit right off the shelf, most of the action in consumer robots right now is in kits. Anthony Fudd, a 26-year-old architecture and mechanical engineering student at the Massachusetts Institute of Technology, has what some people might see as an ideal job, spending his days building toys from Lego blocks. Best known for filling the world with nearly 200 billion little plastic blocks that hurt like heck when a parent is walking barefoot around the house, Lego has been working with researchers at M.I.T. for nearly a decade to create computer-controlled toys. One of the first commercial results of such research is the Lego Mindstorms Robotics Invention System, which is to go on sale in North America about Sept. 15 (www.legomindstorms.com). The kit takes relatively sophisticated robotics technology and puts it into the hands of children (or, to be precise, children 12 and older who can persuade their parents to hand over $200 for a combination of light and touch sensors and motors, more than 700 Lego pieces, Windows-based software and a small, infrared-controlled computer built as an oversize Lego block.) "Everyone who has ever played with toys and models has wanted the toys to play with them," Mr. Fudd said. "And now, with the Robotics Invention System, you can." The brain of the system is made up of the battery-powered computer, called the RCX unit, and the software. Users with no programming experience can assemble prefabricated modules of software on a computer in much the same way as they would snap together a model with plastic blocks. The resulting programs are then beamed to the RCX computer block by an infrared signal, and the smaller computer puts the child's inventions into action. A construction manual in the kit gives detailed plans for several experiments, including one called Refrigerator Fred, a robot that answers the cosmic question, "Does the little light in the refrigerator stay on when the door is closed?" Using light sensors that cause a pair of plastic sunglasses to either hide or reveal his eyes, Fred provides the answer. A slight modification yields a robot that can warn you if a little brother sneaks into your room. Other robot constructions can be as elaborate or as simple as the user desires. Mr. Fudd, for example, built a Lego robot to sort his pocket change and another to turn on a light in his apartment when it gets dark. Additional modules will be sold that enable users to create wild animals, sports robots and a replica of the Mars rover. "It's the basic idea of giving children the power to put their ideas into motion," he said. "And, of course, it's a lot of fun." The Sony Corporation thinks that robots have entertainment value. Sony has been demonstrating a robotic dog, sort of a Robocop Meets the Taco Bell Chihuahua contraption, that it hopes will become the next fad in consumer electronics. The Sony robot dog walks (albeit slowly), wags its tail, fetches a ball and responds to hand gestures for "stay," "sit" and other doggy commands. "It looks much smarter than it really is," Dr. Miller of the KISS Institute said after playing with a prototype. "It looks like it was made primarily out of Sony camcorder components." Sony officials said a robotic dog could be ready for market by 2000. The idea of robotic pets has undeniable attraction to many people. Researchers at the Georgia Institute of Technology are developing a small mobile robot called Pepe (the word is a shortened form of Personal Pet) that its creators hope will someday be perceived as more of a friend or companion than as a robot. "We're trying to develop robots that can interact with people in a natural manner," said Ashwin Ram, an associate professor in the Intelligent Systems Group of the College of Computing at Georgia Tech. "If you're going to plunk one of these robots down in someone's house, you want to interact with it naturally, with speech and gestures, the same sort of way you would interact with real pets. You don't want to have to have a Ph.D. to use a robot." The current version of Pepe looks "like a Tonka truck," Dr. Ram said, but it could eventually take the form of a lifelike, plush toy. The appearance is trivial compared with the robot's intelligence and personality, he said. "Our goal is to enable the robot to pick up the user's speech and gestures, but also to be able to understand the user's intentions, emotional state, needs and goals," Dr. Ram said. "It should figure out when you're tired, happy or playful, or when you don't want to be bothered. You don't want to have it interrupt you and start vacuuming or mowing the lawn when you're unhappy or tired." One of the more unusual robot prototypes on display last week at the National Conference on Artificial Intelligence in Madison, Wisc., was a two-foot aluminum robotic plant, attached to a PC, that slowly blooms, droops and makes little alien noises depending on a text analysis of the owner's incoming E-mail messages. The robot plant, whose official name is Office Plant No. 1, the Kind With Leaves and Roots, was developed by Marc Boehlen and Michael Mateas, graduate students at Carnegie Mellon University. They envision a class of "intimate technology" robots that are more attuned to environments than to specific tasks. In fact, their robots are almost deliberately nonutilitarian. On the other hand, there is something appealing about having a robot servant. In an annual hors d'oeuvres competition at the artificial intelligence conference last week, mobile robots roamed at a cocktail party, using combinations of sonar, computer vision, speech synthesis and other sensing technologies to serve snacks to the humans. One hazard, from the robots' point of view, is that curious humans often crowd around them, making navigation difficult. Each year at this competition, some humans try to confuse the robots by repeatedly stepping into their paths (prompting the robots to use synthesized speech to ask them to move), by covering their vision sensors with hands or, in one egregious example of sabotage, by poking peanuts into a robot's sensors. "It's the kind of thing that if you'd done it to a real waiter, someone would have been punched," Dr. Miller said. Outlandish? Not to anyone who has visited the Yo! Sushi restaurant in London, where some robots make food and others wander the floor serving drinks, growling at customers to get out of their way and muttering robot aphorisms like "life is a never-ending circuit." Risto Miikkulainen, an associate professor of computer sciences at the University of Texas at Austin, said of the sushi bots, "It was the first time I've run across a robot like this in the real world, not in a demonstration." Asked about the potential for robot servants in the home, Dr. Miikkulainen, an expert in neural networks and cognition, was circumspect. "It seems to me that there is a real shift going on," he said. "Robots used to be used for extremely close alignments on the factory floor, where everything is controlled. The trend now is to make them more open-ended and adaptive." The home will be the true test of machine adaptation, as humans rearrange furniture, toss shoes and dirty clothes on the floor, set stereo systems blaring and turn lights on and off. But while such environments would be hell for today's robots, tomorrow will be another story, scientists say. Dr. Hans Moravec, principal research scientist at the Robotics Institute at Carnegie Mellon, recently wrote a business prospectus outlining the development of "autonomous free-ranging utility robots for the mass market before 2005." Until recently, Dr. Moravec said, autonomous robots -- those capable of operating without direct human control -- had the functional intelligence of insects. "Today the actual level of intelligence of computers is just starting to touch the lower vertebrate levels," he said. "As soon as 2010, we could have general-purpose robots comparable in intelligence to lizards. Then there could be mouselike intelligence, with learning and adaptation, by 2020, and monkeylike intelligence by 2030." At that stage, Dr. Moravec said, "you could be talking to the household robot and you would think that it is conscious." By 2040, the fourth-generation household robot could add a layer of reasoning and become humanlike, Dr. Moravec said. "After that, we humans are obsolete," he said with a chuckle. Thinking Small Vision of Wild Robots, Tame Robots By PETER H. LEWIS MARK W. TILDEN, an engineer and physicist at the Los Alamos National Laboratory in New Mexico, is the founder of one of the more vigorous robot-developer subcultures, called BEAM, for Biology, Electronics, Aesthetics and Mechanics. BEAM robots are typically small, buglike, solar-powered devices created from springs and wires and scavenged parts of old pagers, cassette players and other effluvia of the electronic era. Unlike most other robots, BEAM bots almost always lack microprocessors and complex software. The key words are small, simple, cheap and hardy, which makes BEAM robots ideal for hobbyists, ranging from grade-school students to physicists. The following are excerpts from an E-mail exchange with Dr. Tilden this week: Q. Do you think we'll have personal robots any time soon? A. Three reasons we don't have robots: autonomy, complexity and Terminator-phobia. Autonomy in that try as we can, we cannot commercialize a working machine with the independent-power life span of a housefly. Complexity: If 60 percent of all VCR's are flashing 12:00, who's going to take the time to program a robo-puppy that's too fragile to play with? Finally, there's Terminator-phobia, or more exactly, the cultural leftovers of the Industrial Revolution. Not a day goes by without the "robots will take over" message blared from many a media orifice (no disrespect intended). The fact is that without humans, all machines stop. So chill. Q. Do you think consumers are ready to bring robots into their homes? A. Robots should be designed and placed in the outside world, where they can perform unsupervised tasks for years without human supervision. Rain-forest-planting, Chernobyl-cleaning, land-mine-stomping, moon-prepping machines. Once we have these "wild" robots and they are seen to work, then and only then will people take an interest to domesticate them. If a kid brings home a wild robot and grows bored with it in a few days, no problem, let it back out into the forest to repair the fiber cable. After this will come the second market, which will be bots for the home. Not a Lieut. Cmdr. Data in an apron, but instead a collection of slow automatic devices for house and garden that will passively, reliably, do the job of removing small inconveniences from your life. Site-Seeing: Robotics The synergy between robots and computers has resulted in many fine World Wide Web links to consumer robotics. Almost all the sites listed below have extensive links to other robotics sites on the Web and Usenet. CLUBS: www.seattlerobotics.org www.dprg.org www.robotgroup.org www.rdrop.com/users/marvin FREQUENTLY ASKED QUESTIONS: www.frc.ri.cmu.edu/robotics-faq BEAM ROBOTICS: sst.lanl.gov/robot COMMERCIAL SITES: www.robotstore.com www.legomindstorms.com Graphic Photos: (Above and center, George Ruhe for The New York Times; at right, Reuters)(pg. G1); WORK AND PLAY -- Anthony Fudd, a Massachusetts Institute of Technology student, spends his days with Lego robots like this one. (Morry Gash for The New York Times)(George Ruhe for The New York Times)(pg. G5) Chart/Photos: "The Clitter-Clatter Of Robotic Feet" In their 77-year history, robots have sometimes been seen as a physical manifestation of people's fears and fascinations with technology, like the Industrial Revolution, nuclear power, space flight and computers, and have sometimes been seen as just cute. 1921: The word robot is coined from the Czech words for "forced work" by Karel Capek, a Czech dramatist, in his play R.U.R. (Rossum's Universal Robots). 1926: Fritz Lang's silent film Metropolis, set in 2026, features an evil, sexy robot named Maria. 1930's and 1940's: Robots proliferate as bit players in science fiction and adventure films. 1951: Gort the robot in "The Day the Earth Stood Still" warns of nuclear technology run amok. 1956: Robby the Robot in "Forbidden Planet" becomes Hollywood's first robot star. 1962: When the cold war got too scary, robots appear on television as comic relief. Here's Rosie the Robot in "The Jetsons." 1965: "Lost in Space" introduces the Robot and, "Danger, Will Robinson!" 1977: C3PO and R2D2, in the "Star Wars" movie, become robot superstars at the dawn of the computer age. 1987: "Star Trek, the Next Generation" introduces Lieut. Comdr. Data, an android. 1988: "Mystery Science Theater 3000" includes Crow T. Robot, Tom Servo and Gypsy, robots from the junkpile. 1997: Sojourner, a six-wheeled robot rover about the size of a small microwave oven, begins roaming the surface of Mars. (Photographs: bottom left, Culver Pictures; bottom right, Associated Press; others, Photofest.)(pg. G5) Load-Date: August 6, 1998 End of Document Companies Start Fund to Reward Hospitals for Better Care The New York Times

Time: 31/10/2014  
Some days I think nobody knows me as well as Pandora. I create a new music channel around some band or song and Pandora feeds me a series of songs I like just as well. In fact, it often feeds me songs I'd already downloaded onto my phone from iTunes. Either my musical taste is extremely conventional or Pandora is really good at knowing what I like. In the current issue of Wired, the technology writer Kevin Kelly says that we had all better get used to this level of predictive prowess. Kelly argues that the age of artificial intelligence is finally at hand. He writes that the smart machines of the future won't be humanlike geniuses like HAL 9000 in the movie ''2001: A Space Odyssey.'' They will be more modest machines that will drive your car, translate foreign languages, organize your photos, recommend entertainment options and maybe diagnose your illnesses. ''Everything that we formerly electrified we will now cognitize,'' Kelly writes. Even more than today, we'll lead our lives enmeshed with machines that do some of our thinking tasks for us. This artificial intelligence breakthrough, he argues, is being driven by cheap parallel computation technologies, big data collection and better algorithms. The upshot is clear, ''The business plans of the next 10,000 start-ups are easy to forecast: Take X and add A.I.'' Two big implications flow from this. The first is sociological. If knowledge is power, were about to see an even greater concentration of power. The Internet is already heralding a new era of centralization. As Astra Taylor points out in her book, ''The People's Platform,'' in 2001, the top 10 websites accounted for 31 percent of all U.S. page views, but, by 2010, they accounted for 75 percent of them. Gigantic companies like Google swallow up smaller ones. The Internet has created a long tail, but almost all the revenue and power is among the small elite at the head. Advances in artificial intelligence will accelerate this centralizing trend. That's because A.I. companies will be able to reap the rewards of network effects. The bigger their network and the more data they collect, the more effective and attractive they become. As Kelly puts it, ''Once a company enters this virtuous cycle, it tends to grow so big, so fast, that it overwhelms any upstart competitors. As a result, our A.I. future is likely to be ruled by an oligarchy of two or three large, general-purpose cloud-based commercial intelligences.'' To put it more menacingly, engineers at a few gigantic companies will have vast-though-hidden power to shape how data are collected and framed, to harvest huge amounts of information, to build the frameworks through which the rest of us make decisions and to steer our choices. If you think this power will be used for entirely benign ends, then you have not read enough history. The second implication is philosophical. A.I. will redefine what it means to be human. Our identity as humans is shaped by what machines and other animals can't do. For the last few centuries, reason was seen as the ultimate human faculty. But now machines are better at many of the tasks we associate with thinking -- like playing chess, winning at Jeopardy, and doing math. On the other hand, machines cannot beat us at the things we do without conscious thinking: developing tastes and affections, mimicking each other and building emotional attachments, experiencing imaginative breakthroughs, forming moral sentiments. In the age of smart machines, we're not human because we have big brains. We're human because we have social skills, emotional capacities and moral intuitions. I could paint two divergent A.I. futures, one deeply humanistic, and one soullessly utilitarian. In the humanistic one, machines liberate us from mental drudgery so we can focus on higher and happier things. In this future, differences in innate I.Q. are less important. Everybody has Google on their phones so having a great memory or the ability to calculate with big numbers doesn't help as much. In this future, there is increasing emphasis on personal and moral faculties: being likable, industrious, trustworthy and affectionate. People are evaluated more on these traits, which supplement machine thinking, and not the rote ones that duplicate it. In the cold, utilitarian future, on the other hand, people become less idiosyncratic. If the choice architecture behind many decisions is based on big data from vast crowds, everybody follows the prompts and chooses to be like each other. The machine prompts us to consume what is popular, the things that are easy and mentally undemanding. I'm happy Pandora can help me find what I like. I'm a little nervous if it so pervasively shapes my listening that it ends up determining what I like. I think we all want to master these machines, not have them master us. http : // www.nytimes.com/2014/10/31/opinion/david-brooks-our-machine-masters.html Load-Date: October 31, 2014 End of Document Maybe Information Actually Doesn’t Want to Be Free The New York Times

Time: 23/02/2012  
 Ask an expert what the mobile phone industry of the future looks like and you'll get what seems to be a dystopian vision straight from the dark imagination of sci-fi. With the power to buy, sell and make decisions on our behalf, phones will come to dominate our lives, invading our privacy and, via under-skin implants, our bodies. It isn't all bad. As they become more sophisticated, phones will completely unshackle us from our desktops, will use up less time and money -- and could even save our lives. "The fact that the word 'phone' is in the title of these devices is misleading," says Ray Hammond, a so-called futurologist who has carved a career out of accurately forecasting technological leaps. Hammond envisages the candy bar-sized phones and shiny tablets of today being broken into separate components. Fashionable spectacles will provide the visual display, earring studs the audio. A third device will provide touch input. "What we're talking about is a complete physical interface to the digital and virtual worlds," he said. Most experts agree that plotting a future for mobile devices is a challenge, given the recent rapid evolution of simple cell phones into powerful computers replete with talking personal assistants like Apple's Siri. What is known is that, as they are plugged directly into an ever-swelling torrent of data, tomorrow's smartphones must be smarter than ever -- capable of protecting us from information overload. "Siri is the first of what will become a slew of what are essentially software assistants controlled by voice," says Hammond. "The voice side is going to become much better very rapidly." As well as organizing our diaries and answering pop quizzes, these assistants will become our data guardians, using artificial intelligence to learn our personal preferences as they tailor and streamline the flow of data we are bombarded with. "When we have a large screen, we can browse through large amounts of text, but that's not possible on a mobile device," says Lars Hard, CEO of artificial intelligence software firm Expertmaker. "So we need to bring more brains onto the device, so we can provide more relevant information when needed... based on artificial intelligence. Because that's the kind of technology that brings the device closer our own reasoning capabilities." But in order to do this, we must give these gadgets even more license to snoop on our every move, allowing them to build up dossiers of data that marketers in the exploding mobile advertising sector will be itching to get their hands on. "A mobile device is mobile in nature, so as that device moves around with the individual it is possible, with users' consent, to build up a very rich profile of how that device moves and how that user behaves," says Rob Jonas of mobile advertising network InMobi. "All sorts of interesting patterns can be detected and of course that becomes very valuable for advertisers looking to reach those consumers." Jonas concedes that privacy is a "hot topic," but says in future users will become more comfortable trading it in return for an enhanced online experience. "The research we've got on our network globally has shown that consumers are willing to trade that consent as long as they get value," he adds. Advertising is key to the future of mobile, say experts, not least because it will become a major driving force in the development of software apps at a time when these begin to eclipse the importance of the gadgets themselves. Micah Adler, CEO of app promotion firm Fiksu forecasts that annual app downloads in excess of 100 billion by 2015 will create a software-driven market in which dominant operating players Apple and Android will thrive at the expense of all others. But, he says, this swamped but increasingly competitive marketplace will encourage the evolution of apps that will not simply replicate what we can do on our computers, but will also enhance our existence. "That's not to say there won't be a thriving market of things that are imported from the desktop, but the piece I'm most excited about is the piece that makes a difference to people's lives," he says. Cloud computing technology that offloads storage and processing into cyberspace should also result in more durable gadgets replacing the quickly outmoded handsets of today, according to Morten Warren of industrial design agency Native Design. "This will enable more manufacturers to sidestep the technology arms race, allowing them to refocus on more sustainable, longer lasting products and propositions," he says. And far from turning us into gadget-junkies with aching wrists and thumbs, the enhanced data-handling efficiencies of these devices should, in theory, liberate us and improve our wellbeing, says Lars Hard. "Today the young generation are almost forced to be glued to a screen to catch up with everything on Facebook because all their friends are putting this pressure on them. "But by having more personalization and personal agents that act as proxies for you, you can reduce the time you need to spend on the machine." Hard predicts that currently available medical diagnostic hardware could become standard, offering real time biometrics that will detect health problems, alert physicians and prevent serious illness. Hammond goes even further, suggesting mobile devices will become so in-tune with our bodies that miniature components will be implanted under our skin. This, he admits, pushes deeply into the disturbing realm of science fiction. "It won't be everyone's cup of tea," he adds. Load-Date: February 24, 2012 End of Document How our mobiles became Frankenstein's monster CNN Wire

Time: 13/03/2012  
 Any author or filmmaker seeking ideas for a sci-fi yarn about the implications of artificial intelligence -- good or bad -- would be smart to talk to Ray Kurzweil. Kurzweil, the acclaimed inventor and futurist, believes that humans and technology are blurring -- note the smartphone appendages in almost everyone's hand -- and will eventually merge. "We are a human-machine civilization. Everybody has been enhanced with computer technology," he told a capacity crowd of more than 3,000 tech-savvy listeners Monday at the South by Southwest Interactive conference. "They're really part of who we are. "If we can convince people that computers have complexity of thought and nuance ... we'll come to accept them as human." A pioneer in the field of speech recognition, Kurzweil is perhaps best known for his bestseller, "The Singularity is Near," which predicts that in the future we will augment our bodies with technology, including robotics and artificial intelligence. "We created these tools to extend our reach," he said -- something we've been doing as humans "ever since we first picked up a stick to reach a tree branch." Asked by interviewer Lev Grossman whether artificial intelligence will lead to malevolent machines that will come to dominate humans, he said he was more concerned about what humans will do to themselves. "I don't see it as 'us vs. them.' I see it as 'us vs. us.' " Kurzweil believes technology is advancing at exponential speed -- so fast that previously unimaginable inventions will be a reality within decades. He cited nanotechnology -- microscopic computers -- that will be 1,000 times more powerful than human blood cells and injected in people's bloodstreams to give them superhuman endurance. He also believes computer technology is democratizing society by empowering anyone with creativity and and a broadband connection. "You can start world-changing revolution with the power of your ideas and the tools that everyone has," he said. "A kid in Africa has access to more information than the president of the United States did 15 years ago." The 64-year-old author made a few other bold predictions in his hourlong talk: -- "It's an amazing threshold that people are talking to computers [in natural language]," he said, when asked about Apple's Siri. "Siri is only going to get better." -- Moore's Law, the rule of thumb that the pace of innovation in computer technology doubles every 18 months to two years, will come to an end by 2020. -- "As we go through this decade, search engines aren't going to wait to be asked. They'll be listening [to humans] in the background. And [the search results] will just pop up." Load-Date: March 14, 2012 End of Document 'Resident Evil: Operation Raccoon City' a disappointing chapter CNN Wire

Time: 24/07/2006  
Humans are creative enough to deal with any situations. I am expecting a war between humans and Intelligent software agents in Cyber-Space in a decade or so. But, as i said, humans will take the lead, and it is a great source to learn new things. Zeeshan-ul-hassan Usmani, Melbourne, FL (Aug. 16) ------------------------------------------------------- I'm an AI researcher, so I guess my opinion is a bit biased. Overall I believe AI will be a benefit, otherwise I wouldn't be in the field. However, I don't think the effects of AI will be as dramatic as people think. I just returned from the GECCO conference (Genetic and Evolutionary Computation COnference) which is a gathering of AI researchers on the forefront of the field. They're a long way from creating a human level intelligence. There were exciting developments, to be sure, but we're not going to have conscious, self directed computers any time soon. (I'd wager about 100 years.) Greg Barton, Dallas, TX (Aug. 9) ------------------------------------------------------- Human brain is a product of evolution with a tremendous time, yet AI is not. Needs enormous time to create the exceeding brain of humans. Anyway, there is nothing either exceeding or not, but human thinking makes it so. No threat and no benefit. Nagahama Jack, Tokyo (Aug. 9) ------------------------------------------------------- Great article. I track artificial intelligence along with other emerging technologies, and find that Ray Kurzweil's Law of Accelerating Returns progressing at such a pace where ethics and legal issues can't keep up with technological development. I for one am expecting airplanes without human pilots, and cars which drive themselves - within a decade... Ted Stalets, Nashville, TN (Aug. 9) ------------------------------------------------------- Its not a matter of the "processing power" our IT systems have, its how that capability is used, the connections of billions of neurons with thousands of imputs that support our minds cannot be compared to the simplistic serial instruction "calculators" that we have. Its like saying if you have the tools, anyone can be a great artist. Please, get a science adviser! Robin Colclough, Spain (Aug. 9) ------------------------------------------------------- In the beginning Artificial Intelligence will benefit to humanity, but as always men never satisfied with every thing they had, we want more and more and the thing we made before become Threat against us. It will come someday and somehow Artificial Intelligence become a threat against humanity. David, Co. Kildare, Ireland (Aug. 9) ------------------------------------------------------- Load-Date: August 17, 2006 End of Document Futurist: We'll someday accept computers as human CNN Wire

Time: 27/11/2013  
When IBM's Watson system defeated the human champion on "Jeopardy!" in February 2011, it surprised the world with its unprecedented command of a vast array of facts, puns, and clever questions. But how will that feat change our lives over the next decade? What does it mean for the future of intelligent machines? Watson accumulated its wide-ranging knowledge by "reading" the equivalent of millions of books, foreshadowing a revolution in how computers acquire, analyze, and create knowledge. Read more: Ray Kurzweil's future of humanity Given the explosive volume of text available to anyone today in the form of web pages, articles, tweets and more, automatic machine reading is a critical part of technology's future. Here are five ways we predict the Machine-Reading Revolution will change your life in the coming decade: 1. Being a scientific assistant: By 2020, machine reading and understanding of scientific text has the potential to accelerate breakthroughs like helping find new cures to diseases or solutions to climate change. The Allen Institute for Artificial Intelligence's Aristo project is building software that will enable computers to "learn" from textbooks, ask questions, and draw tentative conclusions. Building on this, and related projects like Watson, this kind of assistant will become an indispensable tool for scientists and researchers. Read more: I'm the original voice of Siri 2. Answering questions: When you ask your smartphone a specific question like "when's the next flight to Atlanta?" or even "what's President Obama's current approval rating?" You'll be able to receive direct and concise answers on your device. Programs like Siri and Google Now can already answer spoken questions like "when's the next Yankees game?" Over the coming decade, the range of answerable questions will broaden substantially, and the answers will be based not only on databases of facts, but also on information automatically extracted and synthesized from news, web pages, and tweets. Thus (as Etzioni anticipated in 2011): On our phones, ten blue links will gradually become a thing of the past. 3. Being an online shopping concierge: We foresee an automated concierge that makes personalized product recommendations based on your tastes and reading all available reviews on the Web. Today, if you want to find a quiet hotel in mid-town Manhattan, you may be forced to spend hours combing through hotel reviews to figure out which ones are relevant, authentic, and informative. Read more: Siri says 'dump him' In just a few years, a computer will comb through the reviews for you. Research prototypes like Huang and Etzioni's RevMiner have already shown that computers can read and analyze reviews with high accuracy. It's only a matter of time before shopping excursions are truly one-click endeavors. 4. Acting as an automated medical assistant: Imagine getting an immediate "second opinion" based on the latest medical studies and experiments right in your doctor's office, or even in the comfort of home. Today, any doctor is overwhelmed by the deluge of new medical studies and discoveries. By 2023, your doctor will have a tireless medical assistant who keeps up with the scientific literature on his or her behalf, and warns against potential errors such as unnoticed drug interactions, dangerous side effects, and more. 5. Delivering real-time statistics: Within a decade, authoritative statistics on health, inflation, and unemployment will be available in real-time, benefiting both policy makers and the general public. Read more: The best Twitter jokes about Amazon's drones Today, we often find out about the outbreak of epidemics, health hazards, and economic concerns long after the fact. Yet status updates on social media can reveal important clues about our location, community health, and even employment status immediately. Research is underway to anticipate epidemics and address other public health questions that today are studied via surveys and slower, less-inclusive methods. Henry Kautz reports on research to monitor food poisoning outbreaks in New York City, University of Michigan researchers are computing analogous statistics for unemployment, and the Billion Prices Project at MIT provides far richer inflation measurements than the government's official index. In the near future, approximations to official data will be available instantaneously. Read more: Forget flying cars, check out these flying robots We recently launched the Allen Institute for Artificial Intelligence (AI2) in Seattle to carry out basic research in the area of machine reading and understanding of text, which will enable the broader community to pursue the above innovations. Within a decade, computer knowledge acquired from "Big Text" will be available at any time, any place, and accessible via a dialog that would make the Star Trek Communicator proud and put Siri to shame. As Allen observed in 2011, the singularity is far beyond the horizon, but the Machine-Reading Revolution is coming to a mobile device near you. Load-Date: December 12, 2013 End of Document AI set to exceed human brain power CNN.com

Time: 30/06/2005  
 environmental degradation, overpopulation, clean and sustainable energy sources, education, and poverty. Our continual over-use and mis-use of the environment is perhaps the most pressing problem. The pressing need for sustainable energy sources has been gaining support much too slowly. We are burning fossil fuels at an ever-increasing rate, hurting the environment, and depleting un-renewable resources. Governments need to encourage the design and production of systems which foster true sustainable energy sources. Tony Woodard Mission to Mars I have a vision of a world that comes together under a common goal -- the manned exploration of Mars. If a world leader were to champion this cause, and all of the world were to align their goals under this common cause, then we would have focus and hope, the two elements missing in modern life. Every person on Earth could play a part in this shared goal, and our social ills would dramatically reverse, as hope and vision replace despair. Chris Gorski, New Hartford, CT Fuel of the future Through sheer determination, need and will power, humankind will find the right solution and make renewable energy both safe and affordable to us all. Hydrogen is the most abundant molecule in the universe. One day hydrogen hydride (solid) cartridges will be available in re-fueling stations for us to buy as we stop by. These cartridges will allow us to drive for hundreds of miles at a time before a change is needed. Transportation, afforded to us by the invention of the automobile, has been the most significant factor driving the economies of the world. It will remain so because humans will demand it as an expression of our freedom to go and explore, both on our planet, our neighbor planets and others beyond. Manny Valle Land and sea I believe that in the future more people will be living directly on the water. Land will be needed to produce food and livestock as well as setting apart areas of the world to save other living creatures. We spend billions of dollars on wars, weapons and only the government knows what else, we should spend money on building water purification systems using sea water to pump to areas that are starting to turn to desert and plant trees. We should also try cutting the population growth by helping women to space children and not to have so many. We can do a great deal to save our beautiful world and undo the harm we have done, but we can't continue to be so selfish if we truly want to leave a better place for the future. Arlene F. Voelker, Baltimore, MD Space industry Every single nation on earth should begin a space exploration support industry. End the petty squabbles over an imaginary line on the ground. This is our planet together -- all of us are involved. We need a space observation station on the moon and a full Mars mining colony. Ready to conquer the stars rather than trying to conquer each other. Sam Blackstock, Thailand Global peace The 21st century is going to give us more peace and understanding than any other time. Why? The world now knows what each of us wants and will co-operate. Dr Firozali A Mulla, Tanzania Global disasters In 20 years the percentage of those who believe in God will be reduced to a single digit. The United States will collapse and give way to a World Community. Natural disasters will increase each year while we argue about the cause. Humans will look at recent technological advances as the earned right to become as gods. With this new knowlege and power we will do as humans always have with great power -- destroy ourselves, and try to rebuild with the hope that we will do better next time. Bryan Bratcher Warped mind I think that it is very important that we follow the President Bush's space vision as outlined in the Moon, Mars and beyond plan! After that the most important thing, as I see it, will be the development of greater means of propulsion so as to be able to explore farther out into space -- the rest of the solar system and eventually the stars also! I know that learned papers have already been written on the subject of the "warp drive" so perhaps the first "baby steps" have already been taken along this road. George Scaglione Wireless power Power lines: We have lived with those large poles and their lines, power and telephone, for well over a century. Soon cell phones will outnumber the wired kind and the need for their lines will diminish. But power lines remain. In the future I see electric power transmitted by some wireless means. Water will be made drinkable by some cost efficient means In the long run. What this, and the mobility of other major services, will mean is that communities could be built wherever people wish. An end to "urban sprawl," pollution, traffic jams and many other problems. These things, along with a cure for major diseases and a better quality of life for all (not just who can afford to buy it), will happen because they have to. Anytime mankind has been faced with major problems someone, or some group, has stepped forward to save us. It will happen again. Chuck Moffet Doom and gloom There are too many humans. We have become so numerous that we have overburdened the planet to such an extent that overcrowding, pollution, disease and war threaten to destroy the earth, our species and all life. In the beginning, we were few, we were in balance, we were an integral part of the natural world. Through our inventions of medicine, agriculture, villages, and technology, we circumvented the laws of nature. With the expansion of cities, the rampant use of chemicals and fossil fuels, the use of nuclear energy and weapons, the move to artificial and genetically modified nutrition (not to mention the rabid pace of life, the deadly levels of stress, and probable pandemics) we are on the verge of destroying ourselves and this lovely world. I see only one appropriate personal response and that is to live a balanced and intensely spiritual life. Viva le gloom and doom! Kurt Gustafson, Corvallis, OR Leukemia breakthrough I envision that in eight to 10 years we will have a shot for leukemia. Specifically, T-Cell PLL (Prolymphacytic Leukemia). My husband just went through a bone marrow, stem cell transplant for T-Cell PLL. It is an extremely rare disease. Allegedly, only 20 others in the U.S. have it. As a result of the success in treating this disease, additional research developed childhood immunizations for breast cancer. Wouldn't that be nice! My husband is currently an inpatient at the University of Michigan Cancer Hospital. We continue to pray for success. Bob and Lynn Hause, Gobles, MI Water levy I would like a penny of every water bill paid by individuals and corporations and a half cent for every bottle of water bought to go to creating publicly-owned water works to provide clean, potable water to every person in the world -- especially in the developing nations of the South. Kathleen Docherty and Steve Marks Tucson, Arizona Future of the species Most predict that there will be an extinction of the human species as we know it. Surveys of the solar system will provide chemical analysis of suitable areas containing frozen water, which will become the bed of future human evolution. A "seed pod" will be developed, implanted with a biotechnological soup. It will be launched in massive numbers to the frozen places in our solar system and beyond. The seed pods will lie dormant until the ice melts, when nano-robots will be released. The robots will begin weaving DNA strands until new entities are formed containing human DNA strains. From there, nature and evolution would take its course. The motto here would be to preserve our form of life, not necessarily our way of life. Rick Hebert Space medicine I currently put patients with chronic or even acute pain syndromes in water to simulate a semi-weightless environment. The patients are able to exercise more effectively and respond better to treatment because they are comfortable given less affect from gravitational forces. I can see a time when patients will be treated in the weightlessness of space, reconditioned and gradually returned to the gravity of Earth. I just hope I am around to see it! Todd Ketron DPT Pollution solution? I have a vision for the 21st century that would help eliminate some of the world's pollution. In a science magazine called Discover there was an article a few years ago that discussed a power plant machine called a depolymerization plant. This machine could break down every kind of waste that is carbon-based into purified water, oil and leftover nutrients. If we used this technique to clean up the world's pollution then that would make a gargantuan difference! Jacqueline Manos I predict... Sea level rise causes collapse in shoreline property values; street protests force emergency legislation extending unemployment benefits for former factory workers; California mandates all new cars and trucks sold in the state be low/zero emissions vehicles; Chinese technocrats stage silent coup with support of military; South America follows EU example with common currency. Bill Manzke, Dublin, OH The final frontier The 21st century would be the beginning of a new era to have the human race begin to expand and colonize the cosmos. The reason for this evolution would be necessity. This could be due to the need for new natural resources, a threat to human existence such as from a comet or asteroid. The first race will be to figure out how we can get into space cheaply from our planet. Once that is accomplished then that is when we will see a move to greater things -- space tourism, colonization of the moon and mars, mining for resources from planets, moons, asteroids. Thomas Slover Sharing Dreams and Experiences Scientists will map activity in one person's brain (Subject A) for every sensation using precisely controlled stimuli. They will perform the same mapping process using the same stimuli on another person (Subject B). Another map can then be created that correlates how their brain activity maps differ or agree for each and every stimulus. Using highly sophisticated sensors, Subject A's brain activity is recorded while he or she is have some experience (preferably a nice experience). The recording is played back and delivered to Subject B using a powerful and selective magnetic generator which energizes the proper parts of Subject B's brain, those proper parts being determined by the previously created correlation map. Imagine being able to send a loved one an electronic Valentine, complete with a real kiss. Neil Donovan, Salem, U.S. Top 10 predictions In the 21st century, I bet the following 10 things happening: 1) Man/Women walking on Mars. (There will be a significant discovery on Mars... water/life/or fossils) 2) Solar power and hybrid power technology widespread and nearly free. 3) African nations will start forming strategic alliances that will explode economically. As is currently happening in India and southeast Asia and with the advent of cheap labor and nearly free energy (Africa's desert is a prime location for solar power). It will surely attract hefty amounts of foreign investment 4) Genetic and Stem Cell research collide and make discovery's that lead to cures for almost all genetic disorders. Average Human Lifespan spurts over 100 by 2099. 5) Formation of a world intelligence/enforcement organization formed primarily with focus on eliminating international terrorist cells. It'll be like INTERPOL on steriods and very little red tape. Their capabilities powers will broaden with every terrorist attack. Attacks will dwindle off and lessen in intensity. 6) Personal identification will be implanted in the form of a chip and/or instantaneous DNA identity methods will be developed. 7) Wireless robotics and artificial intelligence will be fine tuned (especially in military purposes, ie. Unmanned Mobile Turrets/Warplanes). Households will begin purchasing smaller robots that automatically do things such as mowing lawn, clearing snow, vacuum floor, clean windows, and even garden! 8) Satellite Radio will get rid of charging monthly fees will become the new high tech version of the 50's transistor radio. They will rely on advertising income. 9) Education reforms take place and spawn initial woes, but after a few years, educational productivity skyrockets. A second renaissance of ideas and inventions will occur. 10) Extinct animals such as the dodo will be successfully cloned and put on exhibit in a special zoo similar to Jurassic Park. Q. Are some of these ideas cooky? A. Yes. Q. Do they have the potential of actually happening? A. Yes. Anything's possible. Best wishes, Andrew Time to rock the boat Call me crazy, but my vision of our world is as such: The accusition of wealth and power should no longer be the predominant driving force in the world's economy. We, as a people, should strive to better ourselves as a whole, to benefit all humanity. War, disease, poverty, all these afflictions could easily go away if we simply put more emphasis upon the greater good, instead of ourselves. We have gone from a society that was virtually proud to work for a living, and wouldn't mind lending a helping hand, to a society where a great number of people are actually lured to the TV every night, frantically concerned over the trial outcome of a former pop star. The bottom line is this: Greed, wealth, social status, power; these things cost money, and are putting a terrible strain on the people of this world. Kindness, generosity, and the truthful fulfillment of brotherly love cost nothing. I realize this all sounds unrealistic. But if we are to truly preserve the human race, we must start changing things, more so than what we have been doing. Subtle changes mean well, but will sadly take way to long. It's time for the unconventional, it's time for the unorthodox, it's time to rock the boat!!! At least, that's my vision. David N. Howse, U.S. Leadership first I cannot argue with the wisdom of the visionaries who are suggesting what we will experience in the future. I would, however, suggest these attractive possibilities will only transpire if far more embracing and profound events and trends allow them to unfold. The themes presented focus primarily on science and technology, and lifestyles. These two arenas of change are, indeed, the most promising and exciting ones to consider. They are also only the "icing on the cake." Civilization (a word we should probably revisit) is volatile and unstable. Until the threats posed by economic deprivation, lack of education, hatred and aggression and potential pandemics are arrested, the exciting future posed by the visionaries is uncertain, at best. Just as history can trace the ascent and descent of great civilizations, it is possible to develop a similar scenario for planet Earth as a whole. Until our global leadership is more than egocentric politicians, dictators and extremists, this scenario has alarming legitimacy. James S. Taylor, Portugal A numbers game Among the largest challenges of the 21st century will be population management, and this has profound implications for our ideas of private property, morality and infrastructure. Economically, a few things are inevitable: We shall exhaust several resources that, until the present day, we have considered inexhaustible: These are land, water and oil. By the end of the century, we can perhaps add natural gas to the list. I predict the demise of the present day commuter vehicle. It is not merely a case of fuel economy, it is also a question of whether we have any more land to give to eight-lane freeways. So I believe this will be the century during which Americans finally start to consider what it means to be a civilized nation, giving some consideration not just to private property rights, but also to the rights of others, and how these must both be embraced to create communities in which people care to live and work. This is the century of renewable technology. At the same time, we cannot avoid a very difficult and perhaps painful reconciliation between our ideals of private property and emerging values of cooperation and community spirit. Jay Abel, Honolulu, Hawaii Short-sighted I think all this stuff the so-called "visionaries" come up with is very, very dangerous. The person who thought about the "Terminator" movies may have been the true visionary. Computers are machines and they should stay that way. If these visionaries are so smart, surely they can see ahead far enough to know that giving computers (machines) consciousness is the most ridiculous and stupid idea yet. That's the problem with society these days, not enough people look at the Earth and its natural eco systems as being the most important thing. Also, solving poverty and living as one across the globe should be the most important "vision" right now along with stopping pollution. After all, this is the only Earth we have! Dave Lamoureux, Canada Some things will not change With the invention of dazzling new technologies, we will integrate them into our lives, but the fundamental landscape of who we are will always lead right back to our roots, and no matter what we try and invent or change, there'll always be room for improvement on the things we all cherish, and want to see keep going on. We will continue to build buildings, one right next to the next, and huddle them into cities, however gracefully (or not so ergonomically,) the architects' goal will not change, to build them taller and taller than ever before. We'll still have families where two people fall in love, marry, and pass on their traditions to future generations. We'll still eat the same foods and enjoy them all the equally; apple pie and bean chili, French fries and hamburgers, grilled-cheese sandwiches and hot dogs with sour kraut. It won't matter how genetically modified or enhanced they may become; we'll enjoy them all the same. People will still visit far away places, swim in the ocean, and dine on the slopes of the Alps, sampling the finest of thousand year-old European cuisine, or visit the Great Wall in China and marvel at the craftsmanship of ages past. We'll still have our favorite actors and listen to our favorite songs, and even if it's a 5,000 gigahertz with 15,000 megabytes of memory, we'll still buy PCs and play the latest games that aren't already on the Playstation299 or the Xbox 514. We'll all still turn out at the steps of the Capitol to watch the 273rd (and counting) president of the United States take office. We'll build evermore advanced space ships, but the desire will still be that they go farther and farther. We'll even cure cancer, but we'll still go to hospitals when we're sick. And no matter how many dozen mega-pixels or how far the x3 zoom, a picture will still be worth a thousand words. And when it's all over, and we await the dawn of the next century, we'll still reminisce, and think, "What will it all be like in the 22nd century?" Ryan Hensley Who will be in control? There is only one unanswerable question regarding the future of mankind. Will conscious computers attain spiritual enlightenment before it's too late for mankind? The expectation of future A.I. (artificial intelligence) machines which know they exist as we and other animals do is all but inevitable. By the end of this century no man alive will have a certain understanding of how the Internet might work or of the intentions of all or any A.I.s. We will be relegated to following the orders of machines that will have infinite minds compared to ours. Trevor Robertson Energy and automation Advances in computer technology will bring developments in the following areas: Energy: The use of high temperature fission reactors developed to produce inexpensive hydrogen may fill the gap until fusion reaction technology replaces it. The promise of fusion reaction is -- limitless safe power, reclamation of wastes from our garbage dumps, elimination of carbon dioxide producing fuels. Automation: Intelligent and mechanical automation will replace most everyone in existing jobs. This has serious ramifications. If the transition to socialism is not done carefully many will suffer needlessly. Even though the road will be treacherous the outcome will be beautiful. The way I like to visualize what the future will be is a stronger family cell consisting of generations living together. The primary interest will be education with formal education continuing throughout life. As people enter their 20s they marry have children and go back to school. Most education will be done at home but people will also gather because it is desirable to socialize. Everyone will be more active in government. Everyone will serve in some capacity in the government during their lifetime. The importance of human life will be recognized and acknowledged. This will create a goal for civilization to strive at improving the life experience for all. Roy E. Oetting Virtual reality The next 20 years will bring technologies that are difficult to imagine now. We will be able to download people's personalities and memories to a computer, which will enable them to live in virtual reality. The Japanese are seriously working on this now. Knowledge has continued to increase exponentially since the beginning of the knowledge explosion in 1948. In the early 1900s some thought that all knowledge had been discovered. Michael McRae, Toronto, Canada In orbit Before 2100, a new venture into space will be accomplished, with hotels and factories in orbit that produce large incomes for those smart enough to invest in the right places. When large pharmaceutical companies find out just how much cheaper it is to produce drugs in free fall, along with the possibilities of creating new drugs you can't put together on Earth, business in orbit will really start booming. Fritz Owens, New Orleans, Louisiana Little will change I believe that many of the visionaries on the Vision Web site are very far-fetched. Wasn't it imagined that around the year 2000 we would be driving flying vehicles like in the "Jetsons." I can't see any around in 2005. How about the "robots taking over our lives" theory? I don't see that happening either. I believe that things will be about the same in the next 10 or 20 years, with maybe a little more developments in technology -- but nothing that's so revolutionary. Suman Gedala Growing pains be gone Human cloning will be the biggest scientific discovery of all time. Within the next two or three years, scientists will be able to clone humans, directly from stem cells to a complete fully grown adult human being within a few hours -- or maybe even a few minutes. There will be no need for a human host, only a machine in which to incubate and grow the stem cells. Humans will no longer have to go through the growing pains of childhood and adolescence. Also, this scientific breakthrough will definitely put a huge dampener on the religious belief that man was created by God. Sylvie Elliott, Montreal, Canada To Mars, and beyond The 21st century will be the age of wonderment and immense tragedy for humankind. A cure for many afflictions will be found. Dramatic strides in space exploration will take us to setting up a base on Mars to discoveries of other planets like ours, and beyond. Contact with extra terrestrials will occur. Advances in technology will result to the world's first computer with a conscience. This new century will also bring about calamity in unimaginable tragedy. Major earthquakes will cause death worldwide. Greenhouse effect will raise the earth's temperature, resulting in the melting of the polar caps and the rise of the oceans. This will flood coastal cities throughout the world. With the ever-increasing rise of terrorism, terrorists will either release a deadly bio-agent killing thousands, or they will finally get possession of a "dirty bomb" and will hold the world hostage. Roland Balderas Good news Global warming will surpass the threat of nuclear weapons and become the biggest concern of the 21st century. At the end of the century, electricity will be our main energy source, and it will be produced with little waste, and without fossil combustibles. Violence will be decreased greatly worldwide and wealth will be more extended. Population growth will be controlled. And all this achieved without major trauma or crisis. Fernando Torrente, Madrid, Spain Astronomical feats By the end of the 21st Century, we will have placed a Hubble-like space telescope at the extreme outer reaches of our solar system. This device will utilize the gravitational lensing that amplifies light, energy, space signals that enter our solar system, as well as amplifying signals that could be sent out to other solar systems. This phenomenon and its existence, witnessed more and more around other systems, can be found 550 AU out from our Sun (51,150,000,000 miles!). How such a telescope would get there, whether by an highly efficient nuclear rocket, unmanned "Bussard Ram-jet", etc, is beyond me. At this distance, a signal traveling at the speed of light would take two and a half weeks to get back to us! The rewards to NASA, SETI and other space agencies observing a clearer, broader cosmos, however, would be "astronomical." Jared Reise Clean energy My vision is that nearly 100 per cent of the world's electricity will be produced by clean, safe, nuclear fusion, minus the electricity produced by water power. Along with this energy source, we can then inexpensively produce hydrogen for fueling cars and replacing propane and gas as a heating supply for houses. As far as outer space is concerned, I don't think we are ready to spend billions of dollars on space that could be better spent developing the aforementioned sources of energy. Space exploration will come in time but we have more immediate needs to solve first. Terry Bittner Medical synergy The 21st century will be a lot different from today because medicine will advance DNA technology to the point where we can "re-grow" our heart tissue. We will know exactly how to stop a cancerous growth internally by programming a viral vector that has been designed to destroy only that type of cancerous cell. Our normal tissue will be rejuvenated with our own stems cells, as tissues or organs run into medical problems. Organ transplants be a thing of the past and our own DNA will be sliced diced and designed for us to live longer and healthier than ever before. Pain will become only a faint memory. Mike Franchell Everything inter-connected Houses will have mainframe computer systems with permanent high-speed Internet connection, with touch screen terminals in individual rooms. There will also be wireless portable terminals, a bit like a laptop with a touch screen. Keys will be replaced by thumbprint and voice-identification systems. Phone handsets will be replaced by systems in the computer terminals so that phone and video calls can be answered in any room that has a terminal. Sensors that detect when you're in the room will activate room lights. Showers will be pushbutton-activated to control temperature and flow-pressure, and will have presets available. There will be a flat screen above the kitchen sink so that you can be entertained whilst washing-up. Computers will continue to incorporate home entertainment -- TV, Radio, CD, DVD, Pay TV, games, Internet, etc. Books will be available in digital format, so you can read on the portable terminal laptop. Computers will take care of waking up alarms, playing soothing music or heavy metal whilst opening the curtains to let the morning sunlight in. Front doorbells and knockers will be replaced with call buttons and video displays so you can see who's at the door without getting up to answer it or admit you're at home. Great for Mormons! Expiry dates on foods will be micro chipped, so your fridge or digital-pantry can notify you when something is out of date. James Musgrave, Australia Super brains By the time supercomputers can download the "brains" of the rich and of geniuses, the common folk will be able to get implants that will hook up to computers. These implants will remind people of schedules, retrieve phone numbers, directions and "tell" the user the information. As an option, the data will be transmitted to contact lenses specially calibrated to project pictures, including downloadable movies, books, newspapers and TV programs. Rev. Alex Howard, Pueblo, Colorado Paying for thin air? I once thought to myself, "I wonder if one day we'll be paying for water?" Now, here I am today wondering if we'll soon be paying for air. I do think that one day we will be walking around with name-brand "oxy-generators." It'll probably be some form of mask/handkerchief, which will filter pollution or carbon di

Time: 06/11/2014  
Ebola sounds like the stuff of nightmares. Bird flu and SARS also send shivers down my spine. But I'll tell you what scares me most: artificial intelligence. The first three, with enough resources, humans can stop. The last, which humans are creating, could soon become unstoppable. Before we get into what could possibly go wrong, let me first explain what artificial intelligence is. Actually, skip that. I'll let someone else explain it: Grab an iPhone and ask Siri about the weather or stocks. Or tell her ''I'm drunk.'' Her answers are artificially intelligent. Right now these artificially intelligent machines are pretty cute and innocent, but as they are given more power in society, these machines may not take long to spiral out of control. In the beginning, the glitches will be small but eventful. Maybe a rogue computer momentarily derails the stock market, causing billions in damage. Or a driverless car freezes on the highway because a software update goes awry. But the upheavals can escalate quickly and become scarier and even cataclysmic. Imagine how a medical robot, originally programmed to rid cancer, could conclude that the best way to obliterate cancer is to exterminate humans who are genetically prone to the disease. Nick Bostrom, author of the book ''Superintelligence,'' lays out a number of petrifying doomsday settings. One envisions self-replicating nanobots, which are microscopic robots designed to make copies of themselves. In a positive situation, these bots could fight diseases in the human body or eat radioactive material on the planet. But, Mr. Bostrom says, a ''person of malicious intent in possession of this technology might cause the extinction of intelligent life on Earth.'' Artificial-intelligence proponents argue that these things would never happen and that programmers are going to build safeguards. But let's be realistic: It took nearly a half-century for programmers to stop computers from crashing every time you wanted to check your email. What makes them think they can manage armies of quasi-intelligent robots? I'm not alone in my fear. Silicon Valley's resident futurist, Elon Musk, recently said artificial intelligence is ''potentially more dangerous than nukes.'' And Stephen Hawking, one of the smartest people on earth, wrote that successful A. I. ''would be the biggest event in human history. Unfortunately, it might also be the last.'' There is a long list of computer experts and science fiction writers also fearful of a rogue robot-infested future. Two main problems with artificial intelligence lead people like Mr. Musk and Mr. Hawking to worry. The first, more near-future fear, is that we are starting to create machines that can make decisions like humans, but these machines don't have morality and likely never will. The second, which is a longer way off, is that once we build systems that are as intelligent as humans, these intelligent machines will be able to build smarter machines, often referred to as superintelligence. That, experts say, is when things could really spiral out of control as the rate of growth and expansion of machines would increase exponentially. We can't build safeguards into something that we haven't built ourselves. ''We humans steer the future not because we're the strongest beings on the planet, or the fastest, but because we are the smartest,'' said James Barrat, author of ''Our Final Invention: Artificial Intelligence and the End of the Human Era.'' ''So when there is something smarter than us on the planet, it will rule over us on the planet.'' What makes it harder to comprehend is that we don't actually know what superintelligent machines will look or act like. ''Can a submarine swim? Yes, but it doesn't swim like a fish,'' Mr. Barrat said. ''Does an airplane fly? Yes, but not like a bird. Artificial intelligence won't be like us, but it will be the ultimate intellectual version of us.'' Perhaps the scariest setting is how these technologies will be used by the military. It's not hard to imagine countries engaged in an arms race to build machines that can kill. Bonnie Docherty, a lecturer on law at Harvard University and a senior researcher at Human Rights Watch, said that the race to build autonomous weapons with artificial intelligence -- which is already underway -- is reminiscent of the early days of the race to build nuclear weapons, and that treaties should be put in place now before we get to a point where machines are killing people on the battlefield. ''If this type of technology is not stopped now, it will lead to an arms race,'' said Ms. Docherty, who has written several reports on the dangers of killer robots. ''If one state develops it, then another state will develop it. And machines that lack morality and mortally should not be given power to kill.'' So how do we ensure that all these doomsday situations don't come to fruition? In some instances, we likely won't be able to stop them. But we can hinder some of the potential chaos by following the lead of Google. Earlier this year when the search-engine giant acquired DeepMind, a neuroscience-inspired, artificial intelligence company based in London, the two companies put together an artificial intelligence safety and ethics board that aims to ensure these technologies are developed safely. Demis Hassabis, founder and chief executive of DeepMind, said in a video interview that anyone building artificial intelligence, including governments and companies, should do the same thing. ''They should definitely be thinking about the ethical consequences of what they do,'' Dr. Hassabis said. ''Way ahead of time.'' http : // www.nytimes.com/2014/11/06/fashion/artificial-intelligence-as-a-threat.html Graphic DRAWING (DRAWING BY JAMES C. BEST JR./THE NEW YORK TIMES) Load-Date: November 6, 2014 End of Document China Sows Disinformation About Hawaii Fires Using New Techniques The New York Times

Time: 14/10/2005  
If Marvin L. Minsky is correct, then one day, when a computer is programmed to exhibit human-style intelligence, it will also express a desire to listen to music. As one of the founding fathers of artificial intelligence, Mr. Minsky firmly believes in the possibility of machine intelligence. He also believes that music is intimately connected with intelligence, that studying one will shed light on the other. So Mr. Minsky, the Donner Professor of Science at the Massachusetts Institute of Technology, is asking some basic questions. If music is part of every human culture, accompanying religion, ritual and social ceremony, if it makes profound esthetic claims, then what is it? Why do we listen to music? What is its meaning? How is that meaning communicated? Profile of artificial intelligence specialist Marvin L Minsky Technologically and philosophically, it's a fascinating line of inquiry for a computer scientist. Computers are increasingly used as tools in composition and sound production in laboratories at Princeton, M.I.T. and I.R.C.A.M., the French musical center in Paris. As a researcher in artifical intelligence, however, Mr. Minsky does not translate his ideas directly into computer programs. He spends a great deal of time thinking about the nature of the mind, how experience is understood, how memory works and the function of jokes. So far, attempts at creating artificial intelligence have ranged from the relatively simple - determining, for example, a set of responses for a computer-psychoanalyst - to the sophisticated - an advanced chess program that embodies complex game strategies. But how, for example, is a computer to understand language? How is it to recognize irony, context and ambiguity? From Music to the Mind Equally challenging questions may be asked about music. Last year, the summer and fall issues of ''Computer Music Journal,'' published by M..I.T. Press, focused on artificial intelligence and music. Contributors discussed musical analysis by computer, the computer simulation of musical skills and improvisation programs. In artificial intelligence, according to Mr. Minsky, there are now two main approaches. One is to make mathematical logic more powerful. That approach would systematize the processes of intelligence so they are founded upon logical rules. In Mr. Minsky's view, though, ''only the surface of reason is rational.'' The subsurface of the mind is composed of independently acting ''agencies,'' each of which has a function and is called upon under certain circumstances. Mr. Minsky's approach to the mind is a distant relative of Freud's ''Project'' of the 1890's, a speculative construction of a mechanical model that would account for the vicissitudes of mental life. Mr. Minsky is familiar with musical life, having been, as he says, a musical ''Wunderkind.'' But his current interest rests in part in music's resonance with his model of the mind, with its contrapuntal organization, unconscious implications, complexities of independence, control and interaction. ''My impression of professional music analysis,'' he said, ''is that it is shallow because the process of understanding music is pretty far away. It's like understanding grammar, which took thousands of years. Those formal theories that say you've got to resolve a leading tone are just the surface.'' Music, he said, points to a network of associations everyone shares but about which humans cannot communicate, since they have no language. ''If you were a mathematician or psychologist working on music,'' he continued, ''you might try to work out the rules of harmony more carefully. If you're working in artificial intelligence, you have to make a little composer. That means your attention is drawn not so much to the rules of the surface, but to the rules of how the perceptual process proceeds, or how the composer decides what to do next.'' New 'Frames' of Reference Mr. Minsky, then, is not concerned with the syntactic rules of music that might specify, for example, how a dominant chord resolves to the tonic. He is interested in how the mind understands music, which, he suggests, resembles the processes by which the mind understands the world. In encountering a situation, Mr. Minsky believes, the mind calls upon a ''frame'' based on general principles and experience. In a sense, a frame is a hypothesis, with implicit assumptions, about the world. It might involve, for example, the recognition of an enclosed space as a ''room.'' A frame may be understood through transformations - changed perspectives. In some instances, this complex process can be modeled on the computer. For Mr. Minsky, music is an art that teaches about time in the same way that physical action teaches about space. Thus, a sonata becomes an exploration of a musical frame. The theme is the object that is analyzed, seen from different perspectives. At each moment, the mind calls upon a musical frame, a theory about the temporal world. The composer knows how to transform the frame, how to play with its expectations and understandings. Musical frames permit us to identify musical styles; they also encourage our rejection of new material that fails to fit old structures. ''Of what use is music-knowledge?'' Mr. Minsky asks. ''Why do we have music and let it occupy our lives with no apparent reason?'' In answering, Mr. Minsky and many outside computer science are trying to establish a frame through which music and intelligent activity can be viewed. ''A frame is a collection of questions to be asked,'' he recently wrote. But the answers will not come simply. ''We think we know what happens in our minds,'' Mr. Minsky concluded. ''Actually, we're almost always wrong.'' Graphic Illustrations: photo of Marvin L. Minsky End of Document A New Company to Focus On Artificial Intelligence The New York Times

Time: 12/05/2001  
To the Editor: In your May 10 editorial "Mind Over Matter," the statement that the decades-long research in artificial intelligence has been a "crashing disappointment" panders to the popular myth that the main goal of artificial intelligence is to replicate human intelligence. Artificial intelligence is a field of inquiry into computational models of human cognition and perception, the goal being to discover to what extent various human faculties can be captured in a computer. This is different from saying that we want to duplicate intelligence in a machine. With computers becoming ever more powerful, the field of research called artificial intelligence is even more of an intellectual imperative. It's important to know to what extent tasks such as, say, the diagnosis of a suspicious-looking mass in a mammogram as potentially cancerous can be computerized. There are societal advantages to the computerization of those human functions that can be demonstrated to be better executed by computer programs, since computers will perform these tasks more consistently, more reliably and, in many cases, more economically. AVI KAK West Lafayette, Ind., May 12, 1997 The writer is a professor of electrical and computer engineering at Purdue University. Load-Date: May 13, 1997 End of Document Free Course in Artificial Intelligence Is Offered Online, and 58,000 Sign Up The New York Times

Time: 01/04/2002  
When it comes to predicting the future, even the sharpest thinkers routinely have it wrong. In 1943, Thomas J. Watson, then chairman of I.B.M., predicted a world market for "about five computers." In 1966, Arthur C. Clarke guessed that "houses will be able to fly" by the year 2000. Realist cynics say the problem stems from a lack of accountability. Bill Gates may be ridiculed for his 1981 declaration about computer memory, that "640K ought to be enough for anybody," but he is unlikely to be held publicly responsible for it. The Long Bets Foundation, a nonprofit group founded by two longtime Silicon Valley gadflies, Stewart Brand and Kevin Kelly, started an online forum last week for those willing to put their money, and reputations, behind their speculation. "An arena for competitive, accountable predictions," the LongBets.org Web site has already accepted several high-concept wagers from prominent technologists. "The universe will eventually stop expanding," contends Danny Hillis, a leading computer designer, in a $1,000 bet taken up by Nathan Myhrvold, the former chief technology officer for Microsoft. Mr. Hillis argued that "cosmology is subject to fads." Ray Kurzweil, an artificial intelligence expert, bet Mitchell D. Kapor, the founder of Lotus Development, that by 2029 "a computer -- or 'machine intelligence' " will pass the Turing test, which states that artificial intelligence will be proved when a machine's conversation can be mistaken for a person's. Each man wagered $10,000 of his own money. But the money, for these already wealthy and accomplished idea gamblers, is hardly the issue. (Winnings must be donated to a charity of the victor's choice.) "The whole point really is that you're on the record, and the record remembers," Mr. Brand said in an interview. Alexander Rose, the foundation's executive director, said: "These are things that will be hugely consequential to the world, and this is a place for debating what could happen." But Laura Lee, the author of "Bad Predictions," a book that compiles "2000 years of the best minds making the worst forecasts," said that the site better reflected the present than the future. "We'll be seeing lots of computer, communications and security bets, and they will say more about 2002 than 2032," she said. Though some of the wagers may never be settled, Mr. Brand is nothing if not a long-term optimist. "The heavy promise," he said, "is that we will be around in 2125." ANDREW ZIPERN http : // www.nytimes.com Load-Date: April 1, 2002 End of Document A Motherboard Walks Into a Bar ... The New York Times

Time: 24/03/2012  
David L. Waltz, a computer scientist whose early research in information retrieval provided the foundation for today's Internet search engines, died on Thursday in Princeton, N.J. He was 68. The cause was brain cancer, his wife, Bonnie Waltz, said. He died at the University Medical Center at Princeton. During his career as a teacher and a technologist at start-up companies as well as large corporate laboratories, Dr. Waltz made fundamental contributions to computer science in areas ranging from computer vision to machine learning. One signal achievement was the development of a basic technique that makes it possible for computers to render three-dimensional scenes accurately. As part of his Ph.D. dissertation at the Massachusetts Institute of Technology, he developed an algorithm that could extract a rich three-dimensional understanding of a scene from two-dimensional line drawings with shadows. The 3-D research was seminal in the fields of computer vision and artificial intelligence. Known as ''constraint propagation,'' the technique is now used in industry for solving problems like route scheduling, package routing and construction scheduling. At M.I.T., Dr. Waltz was taught by Marvin Minsky, a pioneer in artificial intelligence. Dr. Waltz graduated in 1972, then taught computer science at the University of Illinois at Urbana-Champaign and, later, at Brandeis University in Massachusetts. But it was as a member of a group of researchers at the Thinking Machines Corporation, in Cambridge, Mass., that Dr. Waltz made his breakthrough in information retrieval. Thinking Machines was an early maker of massive, parallel supercomputers, and by joining the company, in 1984, Dr. Waltz gained access to computers that by '80s standards held vast amounts of fast random-access memory, up to 512 megabytes. ''For the first time it was possible to use simple algorithms with lots and lots of data,'' said Brewster Kahle, a computer scientist who directs the Internet Archives and was one of the Thinking Machines researchers. Access to that database was crucial to Dr. Waltz's development of a technique known as memory, or ''case based,'' reasoning. It revolutionized the way computers recognized characters, words, images and later, even voices. Before, a computer had to follow a set of programmed rules to arrive at recognition (it's an ''i'' if there's a dot, for example). Now it could comb through its vast memory and deduce what the image was by comparing it to what had been stored there. The technique transformed the field of artificial intelligence and also greatly advanced voice recognition and machine vision technology. And it led directly to the ''big data'' and data-science approaches that are essential tools for search engines, allowing them to sift through large collections of information to improve accuracy and relevance. ''He was a real pioneer,'' said Peter Norvig, Google's director of research. ''The two main changes that got us modern A.I. were probabilistic reasoning and using memory rather than rules.'' ''I don't know if Larry and Sergey read his papers directly,'' he added, referring to Google's founders, Larry Page and Sergey Brin, ''but the idea, filtered through however many people, was certainly a key.'' While at the University of Illinois, Dr. Waltz turned to the field of natural language understanding, a component of artificial intelligence involving the interpretation of language. With support from the Office of Naval Research, he built a question-answering system called Planes and explored the use of neural networks in language processing. In another early project, a Thinking Machines group led by Dr. Waltz designed an information retrieval system that made it possible for a remote user to gain access to a supercomputer and then be able to search through large volumes of documents. The system, known as Wide Area Information Server, or WAIS, and designed in cooperation with the Dow Jones Corporation, Apple Computer and KPMG Peat Marwick, was not the first information retrieval system. But it was innovative in enabling the user to uncover connections between seemingly disparate documents. For example, the WAIS system was able to give an early warning of the Chernobyl disaster in 1986 after it discovered a report of an abnormal radiation reading in Scandinavia, according to W. Daniel Hillis, the co-founder of Thinking Machines. WAIS also introduced techniques to narrow a document search. It was followed by other search systems, like Veronica, Gopher and Archie, which predated the search engines offered today by Google, Microsoft, Yahoo and other companies. After leaving Thinking Machines in 1993, Dr. Waltz joined the NEC Research Institute in Princeton, where he was president from 2000 to 2002. He left to help create the Center for Computational Learning Systems at Columbia, where he was director. The center has worked with Con Edison of New York in developing systems that can predict power failures and thus enhance maintenance of the electric power grid. Researchers there are also working on creating a computer-based system to give people with epilepsy early warnings of seizures. The technique involves mining data generated by electrodes implanted in patients. Dr. Waltz earlier was instrumental in establishing interdisciplinary research centers: the Beckman Institute at the University of Illinois, and the Volen National Center for Complex Systems at Brandeis. David Leigh Waltz was born in Boston on May 28, 1943, to Maynard C. Waltz and the former Lubov Leonovich. His father, a physicist, worked at M.I.T.'s Radiation Laboratory during World War II and later at Bell Labs. Dr. Waltz obtained both undergraduate and graduate degrees at M.I.T. in electrical engineering. He lived in Princeton. Besides his wife, he is survived by a brother, Peter; a son, Jeremy; a daughter, Vanessa Waltz, and a granddaughter. http : // www.nytimes.com Graphic PHOTO: David Waltz spearheaded advances in artificial intelligence. (PHOTOGRAPH BY EILEEN BARROSO FOR COLUMBIA ENGINEERING) Load-Date: March 24, 2012 End of Document Errant Code? It's Not Just a Bug The New York Times

Time: 03/05/2008  
Like a good gambler, Daphne Koller, a researcher at Stanford whose work has led to advances in artificial intelligence, sees the world as a web of probabilities. There is, however, nothing uncertain about her impact. A mathematical theoretician, she has made contributions in areas like robotics and biology. Her biggest accomplishment -- and at age 39, she is expected to make more -- is creating a set of computational tools for artificial intelligence that can be used by scientists and engineers to do things like predict traffic jams, improve machine vision and understand the way cancer spreads. Ms. Koller's work, building on an 18th-century theorem about probability, has already had an important commercial impact, and her colleagues say that will grow in the coming decade. Her techniques have been used to improve computer vision systems and in understanding natural language, and in the future they are expected to lead to an improved generation of Web search. ''She's on the bleeding edge of the leading edge,'' said Gary Bradski, a machine vision researcher at Willow Garage, a robotics start-up firm in Menlo Park, Calif. Ms. Koller was honored last week with a new computer sciences award sponsored by the Association for Computing Machinery and the Infosys Foundation, the philanthropic arm of the Indian computer services firm Infosys. The award to Ms. Koller, with a prize of $150,000, is viewed by scientists and industry executives as validating her research, which has helped transform artificial intelligence from science fiction and speculation into an engineering discipline that is creating an array of intelligent machines and systems. It is not the first such recognition; in 2004, Ms. Koller received a $500,000 MacArthur Fellowship. Ms. Koller is part of a revival of interest in artificial intelligence. After three decades of disappointments, artificial intelligence researchers are making progress. Recent developments made possible spam filters, Microsoft's new ClearFlow traffic maps and the driverless robotic cars that Stanford teams have built for competitions sponsored by the Defense Advanced Research Projects Agency. Since arriving at Stanford as a professor in 1995, Ms. Koller has led a group of researchers who have reinvented the discipline of artificial intelligence. Pioneered during the 1960s, the field was originally dominated by efforts to build reasoning systems from logic and rules. Judea Pearl, a computer scientist at the University of California, Los Angeles, had a decade earlier advanced statistical techniques that relied on repeated measurements of real-world phenomena. Called the Bayesian approach, it centers on a formula for updating the probabilities of events based on repeated observations. The Bayes rule, named for the 18th-century mathematician Thomas Bayes, describes how to transform a current assumption about an event into a revised, more accurate assumption after observing further evidence. Ms. Koller has led research that has greatly increased the scope of existing Bayesian-related software. ''When I started in the mid- to late 1980s, there was a sense that numbers didn't belong in A.I.,'' she said in a recent interview. ''People didn't think in numbers, so why should computers use numbers?'' Ms. Koller is beginning to apply her algorithms more generally to help scientists discern patterns in vast collections of data. ''The world is noisy and messy,'' Ms. Koller said. ''You need to deal with the noise and uncertainty.'' That philosophy has led her to do research in game theory and artificial intelligence, and more recently in molecular biology. Her tools led to a new type of cancer gene map based on examining the behavior of a large number of genes that are active in a variety of tumors. From the research, scientists were able to develop a new explanation of how breast tumors spread into bone. One potentially promising area to apply Ms. Koller's theoretical work will be the emerging field of information extraction, which could be applied to Web searches. Web pages would be read by software systems that could organize the information and effectively understand unstructured text. ''Daphne is one of the most passionate researchers in the A.I. community,'' said Eric Horvitz, a Microsoft researcher and president of the Association for the Advancement of Artificial Intelligence. ''After being immersed for a few years with the computational challenges of decoding regulatory genomics, she confided her excitement to me, saying something like, 'I think I've become a biologist -- I mean a real biologist -- and it's fabulous.' '' To that end, Ms. Koller is spending a sabbatical doing research with biologists at the University of California, San Francisco. Because biology is increasingly computational, her expertise is vital in gaining deeper understanding of cellular processes. Ms. Koller grew up in an academic family in Israel, the daughter of a botanist and an English professor. While her father spent a year at Stanford in 1981 when she was 12, she began programming on a Radio Shack PC that she shared with another student. When her family returned to Israel the next year, she told her father, the botanist, that she was bored with high school and wanted to pursue something more stimulating in college. After half a year, she persuaded him to let her enter Hebrew University, where she studied computer science and mathematics. By 17, she was teaching a database course at the university. The next year she received her master's degree and then joined the Israeli Army before coming to the United States to study for a Ph.D. at Stanford. She didn't spend her time looking at a computer monitor. ''I find it distressing that the view of the field is that you sit in your office by yourself surrounded by old pizza boxes and cans of Coke, hacking away at the bowels of the Windows operating system,'' she said. ''I spend most of my time thinking about things like how does a cell work or how do we understand images in the world around us?'' In recent years, many of her graduate students have gone to work at Google. However she tries to persuade undergraduates to stay in academia and not rush off to become software engineers at start-up companies. She acknowledges that the allure of Silicon Valley riches can be seductive. ''My husband still berates me for not having jumped on the Google bandwagon at the beginning,'' she said. Still, she insists she does not regret her decision to stay in academia. ''I like the freedom to explore the things I care about,'' she said. http : // www.nytimes.com Graphic PHOTO: Daphne Koller's award-winning work in artificial intelligence has had commercial impact. (PHOTOGRAPH BY JIM WILSON/THE NEW YORK TIMES) Load-Date: May 3, 2008 End of Document Ray Solomonoff, Pioneer in Artificial Intelligence, Dies at 83 The New York Times

Time: 10/10/2011  
Arthur L. Samuel, a computer scientist who did early research on machine learning and artificial intelligence, died July 29 at Stanford University Memorial Hospital in California. He was 88 years old. Dr. Samuel, who lived in Portola Valley, Calif., and was profesor emeritus of computer sciences at Stanford, died of complications from Parkinson's disease, a university spokesman said. He did pioneer work on the thesis that mechanisms could be designed to learn just as humans learn. Beginning in the 1940's and for 20 years thereafter, he worked on writing a computer program in the experimental environment of game playing. Dr. Samuel developed a program that enabled computers to compete successfully with champion checker players. He also invented several seminal techniques in rote and generalization learning. Early Time-Sharing Systems At Stanford he helped program some of the early time-sharing systems at the university's artificial intelligence laboratory and worked on early versons of word processors. Dr. Samuel, a graduate of the Massachusetts Institute of Technology, joined the Stanford faculty in 1966 after working at the International Business Machine Corporation for 17 years and retiring as director of research communications at I.B.M.'s Thomas J. Watson Research Center in Yorktown Heights, N.Y. Before that he spent 18 years with Bell Telephone Laboratories, where he did research on electron tubes that helped lead to the development of television. He was awarded more than 50 patents for his inventions. Dr. Samuel also taught at M.I.T. and at the University of Illinois from 1946 to 1949, and helped establish the university's computer laboratory. He was a consultant to the National Security Agency and was chairman of the Joint Services Committee on electron devices. Dr. Samuel is survived by two daughters, Donna Hussain of Sacramento, Calif., and Margaret Finch of Winsted, Conn.; a brother, Cornell of Hemphill, Tex., and four grandchildren. End of Document Errant Code? It's Not Just a Bug The New York Times

Time: 23/02/2013  
Jack D. Myers, a doctor who was widely regarded as one of the nation's best at diagnosis and who developed one of the first computer programs to help doctors diagnose complex cases, died on Jan. 31 at his home in Pittsburgh. He was 84. Dr. Myers, whose field was internal medicine, was the chairman of the department of medicine at the University of Pittsburgh from 1950 to 1970 and later developed his software there using the principles of artificial intelligence. He once said his system might have quickly identified Legionnaire's disease as a new strain of pneumonia when it broke out in Philadelphia in 1976 and baffled medical science. He compared his software to a doctor's stethoscope, said Dr. Randolph A. Miller, a colleague at Pittsburgh who helped write Dr. Myers's programs and who is now chairman of biomedical informatics at Vanderbilt University Medical Center. "The program could extend a doctor's abilities," Dr. Miller said, "but it could not replace what's between the ears." At its best, the computer could be a diagnostic star. In hospital tests, the computer program was occasionally put up against the intuition of nationally respected doctors as each sought to diagnose a complex case. At times, the program sorted through the symptoms and came up with the correct answer when the doctors could not. Others saw the program as only moderately useful. A 1994 article in the New England Journal of Medicine rated Dr. Myers's system and four others, giving them a collective report card with "a C minus," Dr. Miller said, noting that the rating was based on only the first response by the computer and ignored the program's ability to ask follow-up questions and apply further reasoning. When he began work on the program in 1970, Dr. Myers sought help from computer experts with experience in applying artificial intelligence to medicine. Dr. Myers tape-recorded his thoughts as he made a diagnosis and the programmers devised a way for the computer to follow his steps in making decisions and to apply his methods of reasoning. His first program could match 3,550 symptoms with more than 500 diseases that made up about three-quarters of the diagnoses in internal medicine. It was used at a number of hospitals and medical schools. In the 1980's, Dr. Myers shifted away from his original method, which Dr. Miller described as "find a genius and can their brain." Instead, he built a system that would scan a computer library gleaned from medical research reports. Dr. Myers assigned doctors to study medical articles and code the information for entry into a single database, supplemented by Dr. Myers's own knowledge. That system, called "Q.M.R." for quick medical reference and sold by a company called First Databank, is still in use helping doctors make diagnostic decisions at medical schools and hospitals. Dr. Miller said that the system was not used universally but that its wider use could come with the development of a uniform national database. Dr. Myers was born in New Brighton, Pa. At Stanford University, he received a bachelor's degree in 1933 and a medical degree in 1937. He then worked at Stanford and at Harvard Medical School, Peter Bent Brigham Hospital in Boston and Duke University before joining the University of Pittsburgh. He continued working at Pittsburgh until last year. He was president of the American College of Physicians in 1976-77, and was chairman of the National Board of Medical Examiners from 1971 to 1975. Survivors include his wife of 51 years, Dr. Jessica Lewis; three daughters, Jessica R. Myers of Salisbury, Md., Elizabeth R. Myers of Westwood, Mass., and Dr. Margaret A. Myers of Radnor, Pa.; a son, Dr. John L. Myers of Bangor, Me., and nine grandchildren. Load-Date: February 22, 1998 End of Document Government Watchdog: Software That Sniffs The New York Times

Time: 19/03/2011  
David E. Rumelhart, whose computer simulations of perception gave scientists some of the first testable models of neural processing and proved helpful in the development of machine learning and artificial intelligence, died Sunday in Chelsea, Mich. He was 68. The cause was complications of Pick's disease, an Alzheimer's-like disorder from which he had suffered for more than a decade, his son Karl said. When Dr. Rumelhart, a psychologist, began thinking in the 1960s about how neurons process information, the field was split into two camps that had little common language: biologists, who focused on neurons and brain tissue; and cognitive psychologists, who studied far more abstract processes, like reasoning skills and learning strategies. By starting small -- showing, for instance, that the brain's ability to recognize a single letter was greatly influenced by the letters around it -- Dr. Rumelhart and his colleague Jay McClelland, around 1980, built computer programs that roughly simulated perception. Later, he devised an algorithm that allowed computer programs to learn how to perceive. Using his program, a computer could interpret underwater sonar signals with roughly the accuracy that a person could. It was an important early step in machine learning, a critical component in artificial intelligence. Working at the University of California, San Diego, he eventually developed a simulation of how three or more layers of neurons could work together to process information -- as is required for the brain to engage in any complex task, like reading. Previous models were far cruder. In a landmark 1986 paper, written with Geoffrey Hinton and Ronald Williams for the journal Nature, he described how the system worked. Dr. McClelland, director of the Center for Mind, Brain and Computation at Stanford, said the neural processing work ''led to extremely powerful systems for doing things like visual object recognition and handwritten character classification.'' In 1986, he and Dr. Rumelhart wrote a book, ''Parallel Distributed Processing,'' that became a central text in the field. In their work Dr. Rumelhart and Dr. McClelland argued that language, like most knowledge, relies mainly on memory and is represented in the brain by sets of associations between elements of sound and meaning. This put them in opposition with scientists who argue that the brain generates some words by using rules shaped in part by brain biology -- for example, adding ''-ed'' to a stem to form a past tense. ''Rumelhart was enormously important in the 1980s in reviving this neural network approach to language and cognition,'' said Steven Pinker, a psychologist at Harvard and a leading proponent of the rival ''rules'' theory. Even though they sometimes disagreed, Dr. Pinker said that Dr. Rumelhart's computer simulations ''prompted me and many others to ask very fruitful questions, and that in the end is about all a good scientist can ask for.'' David Everett Rumelhart was born on June 6, 1942, in Wessington Springs, S.D., the eldest of three sons born to Everett, a printer, and Thelma, a librarian. He graduated from the University of South Dakota in 1963 with a degree in psychology and math and completed his Ph.D. at Stanford in 1967. He spent 20 years on the faculty of the University of California, San Diego, before returning to Stanford in 1987. He retired from Stanford in 1998, when the symptoms of Pick's disease became disabling, and moved in with his brother Donald in Ann Arbor, Mich. In addition to his brother Donald and his son Karl, his survivors include another son, Peter; another brother, Roger; and four grandsons. His marriage to Marilyn Austin ended in divorce. Dr. Rumelhart won a number of professional awards, including a MacArthur fellowship and the American Psychological Association's Distinguished Scientific Contribution Award. He also had one named after him: the David E. Rumelhart Prize, a $100,000 award given annually by the Glushko-Samuelson Foundation to any individual or team making a contribution to the ''theoretical foundations of human cognition.'' http : // www.nytimes.com Correction This article has been revised to reflect the following correction: An obituary on Saturday about the psychologist David E. Rumelhart misstated the year that the book ''Parallel Distributed Processing,'' which he wrote with Jay McClelland, was published. It was 1986, not 1987. Correction-Date: March 22, 2011 Graphic PHOTO: David E. Rumelhart in 1990. He created computer simulations of how the brain works. Load-Date: March 22, 2011 End of Document 'Weird Science' The New York Times

Time: 11/11/2003  
The impish man sitting in a warren in a remote corner of the mathematics building at Oxford University in England is Sir Roger Penrose, 68, mathematician, physicist, author, teacher, perhaps one of the greatest living disciples of Albert Einstein. In the 1960's, Dr. Penrose laid much of the foundation for the modern theory of black holes, objects so dense, according to Einstein's theory of general relativity, that they would collapse space around them, creating a hole from which not even light could escape. He is also the inventor of so-called Penrose tiles, which can cover an infinite plane without ever repeating their pattern. Americans know Dr. Penrose from his books on scientific questions, including "The Emperor's New Mind" (Oxford University Press, 1989), which criticizes the idea of artificial intelligence, and "The Nature of Space and Time" (Princeton University Press, 1986), which he wrote with his friend Stephen Hawking. Q. In the last year, there has been an accelerating pace of discoveries in physics and cosmology? Which have impressed you most? A. Some of the most impressive things, I think, are pictures the Hubble telescope has sent down where the gravitational lens effects have been observed. This is the bending of light through Einstein's theory of general relativity, which tells you that light is bent by a massive body such as the Sun. The Sun bends light and acts as a lens. You can detect distributions of mass this way. You may not be able actually to see the mass in this big galaxy, but if there are other things behind it, you can see its lensing effect. Q. Were you surprised by some of the recent discoveries confirming the existence of black holes? A. "Surprised" would be a little too strong. I think recent evidence is pretty potent that black holes are there. For a long time, the evidence was rather indirect. But you knew there was an object out there that was too massive to be anything else. Q. So how are you voting on the shape of the universe? A. Well, there are three main models. One, is positive spatial curvature -- that the universe is like a huge sphere. Two, is zero spatial curvature -- a so-called flat universe. Three is negative -- "saddle-shaped" spatial curvature. I go with saddle shaped. For a host of reasons, I think that's the most likely. And the evidence is in fact shifting toward that. The universe seems "low density" and therefore of negative spatial curvature. In terms of new discoveries, what I wouldn't like is the cosmological constant -- the mysterious cosmic repulsion Einstein inserted into his equations to keep the universe stable -- being non-zero. I've worked in General Relativity for most of my life and there are aspects to the theory, which when you don't have the cosmological constant, are much more appealing -- at least to me. Now, if they find that, yes, there has to be a cosmological constant, I'd have to go along with that. I'm not saying that I've closed my mind to it. I would just prefer the cosmological constant not to be there. Q. And if the cosmological constant is there -- what does that do to your work? A. Complicate it! (Laughs.) Q. You seem to have a good capacity to live with being wrong. A. Well, a scientist should have. If I'm really shamefully wrong, I have to adjust. Q. When you're doing some way-out mathematical computations, do you sometimes feel like an explorer? A. Yes, but also like an archeologist. You are looking for clues that are sort of lying there, hidden. And you see different forms of what may be underneath there and you see some of the corners and you have a sense that there may be some structure that may have influence on various different areas. Then you dig away until you can find what the structure is. Q. There was a debate in this newspaper last fall, "the end of science." Do you agree with those who argue that when it comes to physics and mathematics that we know just about all that can be known? A. The argument is that accessible important ideas will run out, that either we'll never understand certain things or we have already understood them. This is an absurd position to take. People have been saying that for centuries. I can think of a least one major area, which I'm absolutely sure is missing from the present-day physics, which probably will come in the next 50 years or so, and it will be a tremendous revolution. It has to do with how to understand quantum mechanics. See, quantum mechanics describes small-scale phenomena -- atoms, molecules, particles. And if you have certain rules, which if you try to apply them to large objects, they give you nonsense. They will tell you that a baseball can be here and there at the same time. There are endless ways that people try to argue around this. But to me, it says that the theory is just not right and that there is a level that things go over from the quantum to the classical. I think one can make good estimates as to what level that is. And I even have proposals for experiments, which I hope will be performed, which would tell whether this is right or not. Q. Among many physicists today, the leading candidate for Einstein's dream of a unified "theory of everything" is the theory of superstrings, based on the notion that elementary particles are not points but strings? A. String theory is an example of science being driven by fashion. And I have mixed feelings about it. Some of the mathematical notions which people associate with string theory are very appealing. But just because they are appealing doesn't mean that they are right. In a book I'm trying to write now, I want to talk about all these theories, including my own baby, twistor theory -- a mathematical scheme for re-expressing the structure of space-time in which individual points are not regarded as the fundamental things, but entire light rays are taken as more fundamental as individual points. Sorry. I can't explain it in a less complicated way. My point in the book will be that twistor theory certainly hasn't solved some of the problems that I thought it would, but it's very much alive. Q. Ten years ago in "The Emperor's New Mind," you said that computers were not likely to ever have consciousness -- that all they could do was merely "compute." With all the recent advances in computer technology, do you still feel that way? A. Yes. A computer is a great device because it enables you to do anything which is automatic, anything that you don't need your understanding for. Understanding is outside a computer. It doesn't understand. Whereas to know what the calculations are supposed to do, what the answers mean when it's finished, requires your understanding and that's complementary to the computation. And the understanding aspect of it, is something that requires one's awareness, consciousness. If you didn't have consciousness, you couldn't understand. The strong artificial intelligence people feel that consciousness is some kind of "emergent" phenomena; it's something that just comes about. Q. Why do you think some of the artificial intelligence proponents seem to have such a stake in the notion that a machine can outthink a human being? A. I think that one reason is that people really cannot think of anything else which they would call "scientific." And these computing devices are tremendous and they can do computations in a fantastic way. But the artificial intelligence proponents think that's all there is. They think that a scientific theory has to be computational. If you come from mathematics, as I do, you realize that there are many problems, even classical problems, which cannot be solved by computation alone. Another reason is people get work, they get grants, they publish papers and they want to get more money. So they don't like my coming along and saying, "No, no, there are limits to what you can achieve this way." The third is, it's a bit like religion. The question of what the mind, what consciousness is, is related to what people want religion for. Some religious people feel happy with a certain viewpoint and they don't like to be challenged. These artificial intelligence people are somehow happy because they have a model that they are content with and they don't want somebody coming around that disturbs that. Q. In the match a while ago between I.B.M.'s "Deep Blue" computer and Garry Kasparov, whom were you rooting for? A. I was rooting for Kasparov, human chauvinist that I am. I'm not sure that he was the right person to play the match. Because he depends too much on being brilliant. I think Anatoly Karpov, who plays more consistently, but not so brilliantly, would be a much better person. Q. So you don't think that anyone will ever be able create computers with emotions? A. No. I believe there is something going on in a conscious being, which includes many animals, as well as ourselves, that is not a computational activity. And to be conscious at all is not a quality that a computer as such will ever possess -- no matter how complicated, no matter how well it plays chess or any of these things. It doesn't mean, on the other hand, that somebody sometime in the future could not build some kind of a device, NOT a computer, which did whatever we do. I'm saying we won't get at it through computation alone. Q. What are you working on now? A. Two major research areas. The first is twistor theory, and more specifically, in developing its relation to Einstein's general relativity, which I think is key. Once that connection is made clearer, then the hope is, it will give good leads on how to combine general relativity with quantum mechanics. There's a big gap there. If twistor theory can incorporate general relativity then it will give leads on how to unite general relativity with quantum theory. The other thing I'm working on also has to do with the measurement problem in quantum mechanics. It's the link I mentioned earlier between the small scale and the large scale -- and the possibility of experiments that will show the limitations of present-day quantum mechanics. This is an experiment that I hope will actually be performed in space. It's much more directly related to observation than twistor theory, which is mathematical. If the experiment comes out the way I hope, it will tell us we need a major revolution in quantum mechanics. Q. You have toys here in your office. Why? A. (Laughs) Science and fun cannot be separated. http : // www.nytimes.com Graphic Photo: At Oxford University, Sir Roger Penrose, mathematician and physicist, held forth on Einstein, the shape of the universe, quantum theory and chess masters versus I.B.M. (Jonathan Player for The New York Times) Load-Date: January 19, 1999 End of Document What Our Brains Can Teach Us The New York Times

Time: 20/09/2011  
he was 20, Jean Piaget, who died last month at the age of 84, wrote a long prose poem, ''La Mission de l'Idee.'' It opens: ''The Idea surges from the depths of our being … Everything is Idea, comes from the Idea, returns to the Idea. The Idea is an organism, is born, grows, and dies like organisms, renews itself ceaselessly. … Progress springs from the brains of wise men, not from the arms of men of action. The Revolution was made in Rousseau's contemplative walks...'' It was certainly to this contemplative life that the young Piaget dedicated himself, and the task he soon assumed was of heroic proportions: to understand the way all of human knowledge is achieved and to understand intelligence as a part of the process of biological adaptation. As his work progressed, he concentrated on two main areas: the growth of scientific knowledge in mankind and the intellectual development of the child. The aspects of the child's mind that most interested him and that he saw as fundamental are those most resembling the work of a creative scientist: discovering knowledge and constructing new theories. For Piaget, the thinking of children and that of scientists were to be mirrors that reflect and illuminate each other. He soon decided that in every scientific discipline fundamental assumptions are made that can only be justified by relying upon the findings of neighboring disciplines. To avoid an infinite regress, he conceived of the ''circle of the sciences'': although no discipline can quite support itself, through its interconnectedness knowledge as a whole may stand firm. His task was to understand not only how this or that special idea or intellectual skill is attained, but how the intellect grows as a whole. ''My craft,'' said Piaget in an interview with Jean-Claude Bringuier, after some 40 years of work with a long series of collaborators, is ''to study the formation of knowledge.'' He never stopped working, not for a single day in his long life. He knew, or almost knew, his limits, and so did not aspire to the detailed technical knowledge of a specialist in every field he touched. In the 1940's he wrote the formidable three-volume ''Introduction a l'Epistemologie Genetique,'' covering mathematics and physics, biology, psychology and sociology. This and most of his other encyclopedic interdisciplinary efforts remain untranslated, leaving room for the impression that he was a child psychologist who went off on an occasional tangent. Almost the opposite would be closer to the truth. In the 1920's he took up the study of the child as an approach to fundamental epistemological questions. To his surprise, this became a never-ending enterprise. One of the hallmarks of Piaget's work was his persistence and skill in bringing out the non-verbal aspects of thinking. Using his own three babies as sources, he studied the ''logic of action'' and the pre-verbal baby's slow construction in stages of fundamental categories for understanding the world: object, space, time and causality. With older children, he concentrated much of his attention on their long struggle, rarely verbalized in everyday life, to grasp the ways in which objects endure: the baby's emerging understanding that objects have a permanent existence (out of sight is not out of mind or world), the child's expanding grasp of the subtle and unspoken ways in which matter remains unchanged under various transformations (e.g., a clay ball squashed into a pancake does not change in weight). The discovery of this process has often been cited as one of Piaget's major discoveries. But he did not just stumble on an oddity in children's thinking; the problem is one that philosophers and scientists have wrestled with for centuries. It was not until 1789 that Lavoisier's experiments and reflections established the conservation of mass under all chemical transformations. Half a century later, Helmholtz and others showed how energy is conserved through various transformations. In the face of ever-changing experience, asking the question, ''what is conserved?'' is a powerful way of getting knowledge about the world. Thus Piaget saw the link between the discoveries of Everychild and the deepest insights of science. \* In their different ways, ''Conversations With Jean Piaget'' by Jean-Claude Bringuier, ''Jean Piaget'' by Margaret A. Boden, and ''Language and Learning: The Debate Between Jean Piaget and Noam Chomsky'' edited by Massimo Piattelli-Palmarini reveal the theoretical importance of Piaget's attitude toward the breadth of epistemological inquiry. Piaget's first conversation with Mr. Bringuier, a film maker who has worked with other scientists, sets the stage. The not-too-awed visitor in the savant's study points to the terrific mess in which Piaget always worked at home - books and papers piled everywhere, boxes of snail shells, pots of sedum (a genus of plant about which Piaget wrote a fat monograph because he was fascinated by their seeming capacity to anticipate future situations), hardly a place to sit. ''Bringuier: You have a funny office - one rarely sees one like it. I'm tempted to say it's a mess. ''Piaget: As you know, Bergson pointed out there is no such thing as disorder but rather two sorts of order, geometric and living. Mine is clearly living.'' That sets the tone - constant movement from the most ordinary to the most abstruse. There are 14 conversations with ''le Patron,'' some in 1969, some in 1975, and several more with co-workers in various fields, including myself. (We did indeed call him ''Patron,'' with at least as much affection as respect.) In Mr. Bringuier's book, in a pleasant informal way, we see a sophisticated non-scientist exploring Piaget's domain with the master. Some of Piaget's best-known findings about children are explained along the way, but Mr. Bringuier has ways of bringing out the relation of this psychological work to the whole of Piaget's enterprise, and we get a good sense of the man and his work. \* Margaret A. Boden's book may be the only one that makes available for the general reader a clear exposition of Piaget's ideas over his entire range. There are several chapters on children's mental development, one on Piaget and philosophy, one on biology and one on cybernetics. There is little on education. This may be fair enough, since Piaget wrote surprisingly little on the subject, considering his great influence on modern educational theory and practice. Miss Boden's chapter on cybernetics is an original attempt to show how three fields have converged: the cybernetician's study of selfregulating systems, the computer scientist's study of artificial intelligence and the ways in which knowledge and its growth can be represented in a calculating machine, and the genetic epistemologist's (Piaget's) study of the underlying structures that govern the growth of knowledge in people. She begins, ''Cybernetics is the science of self-regulating systems (whether living or not) that function by way of informational feedback.'' She then shows the connection between cybernetic models of thinking and Piaget's theory. For Piaget, at any given point in development the child is a knowing system. He tries to do something and gets information about the world (including the world of ideas, if the task is a mental one) that is fed back into the system. In a way, this sounds like any system that learns through reinforcement, since reward and punishment are types of feedback. But there is a profound difference. In behavioristic models, what is being built up are habitual patterns of action. In Piaget's model, a system of knowledge is being constructed. Once the process of discovery is capped, the knower can put all the actions leading up to the new knowledge behind him. Take one of Piaget's favorite examples. The young child exploring the properties of numbers arranges and rearranges a set of objects, counting them each time. Eventually, he realizes that the rearrangements don't make any difference to the number: the property of number is invariant under the transformation of displacement. ''Once you know, you know forever!'' one child exlaimed. And he never again had to perform any of those acts leading up to the great moment. Not habit but organized knowledge is stored in sophisticated knowing systems: children. An expert in artificial intelligence herself, Miss Boden takes the reader through specific developments in the field and gives a good, critical discussion of the interconnections between artificial intelligence and Piaget's genetic epistemology. It is significant that computer scientists are now quite interested in Piaget's ideas. Their task, like his, is to understand how a system endowed with certain initial properties and interacting with its world can undergo ''cognitive development.'' \* The debate at the Abbaye de Royaumont near Paris centered around Noam Chomsky's challenge to this way of posing the problem. Piaget claims that all mental structures grow out of earlier structures through self-regulated activity. Insofar as this pertains to the ''fixed nucleus'' of fundamental structures of language, Mr. Chomsky replies, ''It seems to me inconceivable that there is any significant relationship between these specific structures and any structures of sensorimotor intelligence or general properties of self-regulatory mechanisms.'' Could a confrontation be more stark? The four-day debate brought together a multidisciplinary cast of scientific stars. Among Piaget's supporters stood his long-time collaborator Barbel Inhelder, the mathematician Seymour Papert, and the cybernetician Guy Cellerier. Among Chomsky's supporters were the philosopher and linguist Jerry Fodor and the anthropologist Dan Sperber. Other participants ranged from Jacques Monod, the Nobel Laureate geneticist, to David Premack, who has been concerned with fostering the linguistic development of Sara, a chimpanzee. Wise men such as Gregory Bateson and Stephen Toulmin were also there. After the opening statements by the main contenders the first to speak in the discussion was another Nobel Laureate geneticist, Francois Jacob. The editor, Massimo Piattelli-Palmarini, has done a masterly job of bringing this event into printed form, adding his own very useful interpretations, an excellent foreword by Howard Gardner, and afterwords by the philosopher Hilary Putnam and the mathematician Rene Thom. The experience of reading the debate as a whole sometimes reminded me of ''Waiting for Godot'' and other times of Edna St. Vincent Millay's marvelous ''Conversations at Midnight.'' In the confrontation with Mr. Chomsky, the master interdisciplinarian Piaget comes up against the master specialist. Mr. Chomsky has of course made profound contributions in more than one field, but in this debate, his claims are those of the specialist. He demonstrates with great technical skill the enormous complexity of adult linguistic competence and says in effect: ''You haven't shown me how adult language might develop, I cannot imagine how this could happen, so I am free to believe that linguistic competence is innate.'' This kind of unimaginability argument reminded me of arguments against evolution in Darwin's times, which cited the impossibility of believing that complex organs like the human eye could have evolved through a process of random evolution. Today we may well believe that, given enough time, any complex organ or function could evolve. Evolve it must, which Mr. Chomsky fully accepts. So the question becomes whether the evolution occurs in the individual or the species, or both. In the debate, Mr. Chomsky comes close to rejecting all proposals that anything fundamental develops in the life history of the individual. If it is important, it must be universal; and if it is universal it must be innate. Piaget, on the other hand, asserts that there is a parallel between the development of language and other cognitive functions in the individual and that the development of language is regulated by its occurrence in a rich context provided by the cognitive and social development of the pre-verbal baby. He also offers some interesting notions about the nature of this developmental process. Again and again, Mr. Chomsky chastises him for not providing a precise, testable theory of how language might develop in the life of the individual. Fair enough; Piaget provides only a general outline of cognitive development and asserts that language, as an aspect of cognition, must follow the same principles. But Mr. Chomsky, too, makes an unsupported claim: that linguistic competence has evolved in the species gradually over time. How might that happen? What are the steps to look for, to think about? How could a proto-human lift itself by its cognitive bootstraps into the world of words and sentences? In this debate, Mr. Chomsky resolutely gives no idea at all of how this might have been accomplished. Even if the transition to linguistic competence were a sudden evolutionary jump, the result of a macro-mutation or a final transforming mutation, a problem would still remain. We would have to believe either that the first child carrying the new hereditary blessing came into a world without language and began to speak, or that the child and her descendants were the vehicles through which language evolved over an indefinite number of generations. The first alternative is implausible, and the second means that a series of precursors to human language can be imagined, which is indistinguishable from Piaget's constructivist position. Because it involved such distinguished participants taking such opposing positions, the Piaget-Chomsky debate should have been a major intellectual event in our century. But in the end, it is often tiresome and scholastic. The offerings are often abstruse, far removed from each participant's expert knowledge. Piaget looks at non-linguistic development and draws parallel conclusions about language. Mr. Chomsky looks at adult language, especially certain syntactic niceties, and draws conclusions about pre-verbal babies. The structure of Mr. Chomsky's argument has something in common with Freud's: look at adults, speculate about babies. So the conference appears to have been a failure, in the short run at least, especially considering the lessons of Piaget's own prototypical work on the growth of perspective-taking in children. In his classic ''three mountain experiment,'' a child looks at a tableau from one position, an experimenter at the same scene from another position. A 5-year-old has trouble imagining himself in the other's position; by about 7 or 8, in this simple situation, he can take the other's point of view. But the long-run significance of perspective-taking is not merely the ability to relativize, to understand others. There is a world to grasp. By seeing it from several perspectives and then coordinating them, we can see it in a deeper way, more truly. Yet in the debate, at no time did the Piagetians ask: if something specific to language were innate, what might it be, and how might it contribute to our understanding of cognitive development? Similarly, at no time did the Chomskyites ask: if something in general cognitive development is constructed in the life history of the individual, what might it be, and how might it contribute to our understanding of language? Not only do the antagonists fail to see each other's point of view, but there is also a certain parallel between their conduct in debate and the overwhelmingly cognitive perspective that they share. For my part, what was missing from the debate is a deep sense of humans as social beings, shaping themselves through intercourse with others. Piaget paid only occasional attention to this, Mr. Chomsky, in his scientific work, none at all. \* Taking the point of view of others can only have value if there is, through a process of reflection, an effort to achieve a larger perspective in which several points of view can be coordinated. As a young man, when Piaget wrote the closing lines of ''La Mission de l'Idee,'' it was this process he had in mind: ''For every individual there will be a doctrine, and their infinite diversity and their contradictions will forever prevent living ideas from becoming automatized, or from struggling against each other.'' Piaget has often been criticized for paying little attention in his research to the emotional and social side of human existence. But he did indeed make fundamental contributions in these areas, reflected in his first psychological book, ''Language and Thought of the Child'' (1923), in one of the three books about his own babies, ''Play, Dreams and Imitation'' (1946), and especially in ''The Moral Judgment of the Child'' (1932). The latter has been extremely influential, providing a point of departure for much good research and wise thinking, and offering an interesting alternative to Freud's ideas about the super-ego. It is unfortunate that Piaget's work on moral judgment, one of his best books, was not mentioned at all by Mr. Bringuier or Miss Boden. In that book, Piaget showed how intellectual factors play a strong role in the development of moral judgment. But he did not picture the moral side of humanity as being totally assimilated by the rest of the intellect. Rather, it is an aspect of human functioning that becomes differentiated from the rest, has its own mental structures, and plays a vital role in regulating conduct. Piaget was unpretentious enough to play marbles with children, sitting on the ground with them to learn the rules of their games, and the developing morality behind the rules. We should not in our pride and modernism forget that human creativity and problem solving must be regulated by moral concerns. Piaget did much to chart the course of moral and intellectual development but he was never satisfied that he had truly explained it, especially the growth of new ideas. His last conversation with Mr. Bringuier gives a sense of the open-endedness of his task. He says, ''Right now what we're studying is the opening-up of 'new possibilities' -how an idea that springs into a subject's head gives birth to new possibilities and creates new routes.'' Notice that the focus is not on the new idea itself, but on the paths that it opens. That was Piaget's way. Graphic Illustrations: drawing End of Document Electronic Variations For Mozart At 250 The New York Times

Time: 21/12/2002  
Dr. Saul Amarel, who helped develop the field of artificial intelligence and founded the computer science department at Rutgers University, died on Wednesday in Princeton, N.J., where he lived. He was 74. The cause was complications of cancer, according to Rutgers. At Rutgers, Dr. Amarel developed computer time-sharing, and his laboratory became an early node on Arpanet, the precursor to the Internet. He took a leave in the 1980's to spend a few years directing a computer science program at the Pentagon, and returned to Rutgers in 1988. Among his peers, Dr. Amarel was perhaps best known for a paper he wrote in 1968, which put him at the vanguard of the artificial intelligence movement. Decades later, the importance of the paper may be hard to understand. It concerned the way one might program a computer to solve a brain-teaser well known to mathematicians that involves three cannibals, three missionaries and a boat that seats only two. The challenge for the missionaries is to transport the cannibals across a river without ever letting any of their party be outnumbered -- and eaten. Solving the problem was not really the point. That had already been done. What Dr. Amarel set out to do was to create an approach that did not rely on a mechanical crunching of numbers, but instead used an algorithm that allowed the computer to figure out a solution in a manner more akin to human reasoning. Later, Dr. Amarel joined artificial intelligence with other fields. He worked, for example, to develop a machine that could diagnose illness, and he envisioned a time when machines would be able to do things like customizing drugs. Saul Amarel was born in Salonika, Greece, and moved with his family to what became Israel. He graduated from the Israel Institute of Technology in 1948, fought in Israel's war of independence, then went to Columbia University, where he earned a master's degree and a doctorate. Before Rutgers, he worked at the Computer Theory Group at RCA Laboratories in Princeton. Dr. Amarel's first wife, Marianne Kroh Amarel, died in 1989. He is survived by his second wife, Irene, and two sons from the first marriage, Dan and David, of New York. http : // www.nytimes.com Load-Date: December 21, 2002 End of Document Oliver Selfridge, an Early Innovator In Artificial Intelligence, Dies at 82 - Correction Appended The New York Times

Time: 10/02/2001  
Herbert A. Simon, an American polymath who won the Nobel in economics in 1978 with a new theory of decision making and who helped pioneer the idea that computers can exhibit artificial intelligence that mirrors human thinking, died yesterday. He was 84. He died at the Presbyterian University Hospital of Pittsburgh, according to an announcement by Carnegie Mellon University, which said the cause was complications after surgery last month. Mr. Simon was the Richard King Mellon University Professor of Computer Science and Psychology at the university -- a title that underscored the breadth of his interests and learning. Mr. Simon also won the A. M. Turing Award for his work on computer science in 1975 and the National Medal of Science in 1986. In 1993, he was awarded the American Psychological Association's award for outstanding lifetime contributions to psychology. In 1994, he became one of only 14 foreign scientists ever to be inducted into the Chinese Academy of Sciences and in 1995 was given awards by the International Joint Conferences on Artificial Intelligence and the American Society of Public Administration. Awarding him the Nobel, the Swedish Academy of Sciences cited "his pioneering research into the decision-making process within economic organizations" and acknowledged that "modern business economics and administrative research are largely based on Simon's ideas." Professor Simon challenged the classical economic theory that economic behavior was essentially rational behavior in which decisions were made on the basis of all available information with a view to securing the optimum result possible for each decision maker. Instead, Professor Simon contended that in today's complex world individuals cannot possibly process or even obtain all the information they need to make fully rational decisions. Rather, they try to make decisions that are good enough and that represent reasonable or acceptable outcomes. He called this less ambitious view of human decision making "bounded rationality" or "intended rational behavior" and described the results it brought as "satisficing." In his book "Administrative Behavior" he set out the implications of this approach, rejecting the notion of an omniscient "economic man" capable of making decisions that bring the greatest benefit possible and substituting instead the idea of "administrative man" who "satisfices -- looks for a course of action that is satisfactory or 'good enough.' " Professor Simon's interest in decision making led him logically into the fields of computer science, psychology and political science. His belief that human decisions were made within clear constraints seemed to conform with the way that computers are programmed to resolve problems with defined parameters. In the mid-1950's, he teamed up with Allen Newell of the Rand Corporation to study human decision making by trying to simulate it on computers, using a strategy he called thinking aloud. People were asked for the general reasoning processes they went through as they solved logical problems and these were then converted into computer programs that Professor Simon and Mr. Newell thought equipped these machines with a kind of artificial intelligence that enabled them to simulate human thought rather than just perform stereotyped procedures. The breakthrough came in December 1955 when Professor Simon and his colleague succeeded in writing a computer program that could prove mathematical theorems taken from the Bertrand Russell and Alfred North Whitehead classic on mathematical logic, "Principia Mathematica." The following January, Professor Simon celebrated this discovery by walking into a class and announcing to his students, "Over the Christmas holiday, Al Newell and I invented a thinking machine." A subsequent letter to Lord Russell explaining his achievement elicited the reply: "I am delighted to know that 'Principia Mathematica' can now be done by machinery. I wish Whitehead and I had known of this possibility before we wasted 10 years doing it by hand." But in a much-cited 1957 paper Professor Simon seemed to allow his own enthusiasm for artificial intelligence to run too far ahead of its more realistic possibilities. Within 10 years, he predicted, "a digital computer will be the world's chess champion unless the rules bar it from competition," while within the "visible future," he said, "machines that think, that learn and that create" will be able to handle challenges "coextensive with the range to which the human mind has been applied." Sure enough, the I.B.M computer Deep Blue did finally beat the world chess champion Gary Kasparov last year -- about three decades after Mr. Simon had predicted the event would occur. Because artificial intelligence has not grown as quickly or as strongly as Professor Simon hoped, critics of his thinking argue that there are limits to what computers can achieve and that what they accomplish will always be a simulation of human thought, not creative thinking itself. As a result, Professor Simon's achievements have sparked a passionate and continuing debate about the differences between people and thinking machines. Born on June 15, 1916, the son of German immigrants, in Milwaukee, Herbert A. Simon attended public school and entered the University of Chicago in 1933 with the intention of bringing the same rigorous methodology to the social sciences as existed in physics and other "hard" sciences. As an undergraduate his interest in decision making was aroused when he made a field study of Milwaukee's recreation department. After receiving his bachelor's degree in 1936 he became an assistant to Clarence E. Ridley of the International City Managers Association and then continued work on administrative techniques in the Bureau of Public Administration of the University of California at Berkeley. In 1942, he moved to the Illinois Institute of Technology and in 1943 received his doctorate from the University of Chicago for a dissertation subsequently published in 1947 as "Administrative Behavior: A Study of Decision-Making Processes in Administrative Organizations." In 1937, he married Dorothea Pye, who survives him along with three children, Katherine Simon Frank of Minneapolis; Peter A. Simon of Bryan, Tex.; and Barbara M. Simon of Wilder, Vt.; six grandchildren, three step-grandchildren; and five great-grandchildren. A member of the faculty of Carnegie Mellon University since 1949, Professor Simon played important roles in the formation of several departments and schools including the Graduate School of Industrial Administration, the School of Computer Science and the College of Humanities and Social Sciences' psychology department. He published 27 books, of which the best known today are "Models of Bounded Rationality" (1997), "Sciences of the Artificial"(1996) and "Administrative Behavior"(1997). In 1991 he published his autobiography, "Models of My Life," and remarked then about his vision of that all-vanquishing computer hunched over the chess boards of the world: "I still feel good about my prediction. Only the time frame was a bit short." And so it was. http : // www.nytimes.com Graphic Photo: Herbert A. Simon (Ken Andreyo/Carnegie Mellon University) Load-Date: February 10, 2001 End of Document Computers That Listen to You Make Strides in Talking Back - Correction Appended The New York Times

Time: 04/12/2008  
Oliver G. Selfridge, an innovator in early computer science and artificial intelligence, died on Wednesday in Boston. He was 82. The cause was injuries suffered in a fall on Sunday at his home in nearby Belmont, Mass., said his companion, Edwina L. Rissland. Credited with coining the term ''intelligent agents,'' for software programs capable of observing and responding to changes in their environment, Mr. Selfridge theorized about far more, including devices that would not only automate certain tasks but also learn through practice how to perform them better, faster and more cheaply. Eventually, he said, machines would be able to analyze operator instructions to discern not just what users requested but what they actually wanted to occur, not always the same thing. His 1958 paper ''Pandemonium: A Paradigm for Learning,'' which proposed a collection of small components dubbed ''demons'' that together would allow machines to recognize patterns, was a landmark contribution to the emerging science of machine learning. An early enthusiast about the potential of interactive computing, Mr. Selfridge saw his ideas summarized in a famous 1968 paper, ''The Computer as a Communications Device,'' written by J. C. R. Licklider and Robert W. Taylor and published in the journal Science and Technology. Honoring Mr. Selfridge, the authors proposed a device they referred to as Oliver, an acronym for On-Line Interactive Vicarious Expediter and Responder. Oliver was one of the clearest early descriptions of a computerized personal assistant. With four other colleagues, Mr. Selfridge helped organize a 1956 conference at Dartmouth that led directly to creation of the field of artificial intelligence. ''Oliver was one of the founding fathers of the discipline of artificial intelligence,'' said Eric Horvitz, a Microsoft researcher who is president of the Association for the Advancement of Artificial Intelligence. ''He has been well known in the field for his early and prescient writings on the challenge of endowing machines with the ability to learn to recognize patterns.'' Oliver Gordon Selfridge, a grandson of H. Gordon Selfridge, the American who founded Selfridges department store in London, was born in London on May 10, 1926. The family lost control of the business during the Depression and emigrated to the United States at the onset of World War II. Mr. Selfridge attended Middlesex School in Concord, Mass., and the Massachusetts Institute of Technology, from which he graduated at 19 with a degree in mathematics. After service in the Navy, he embarked on graduate study at M.I.T. under Norbert Weiner, the pioneering theorist of computer science. He became one of Weiner's collaborators but plunged into the working world of computer science before earning an advanced degree. In the 1960s Mr. Selfridge was associate director for Project MAC, an early time-shared computing research project at M.I.T. He did much of this work at the M.I.T. Lincoln Laboratory, a federally financed research center for security technology. He then worked at Bolt, Beranek & Newman, now BBN Technologies, which develops computer and communications-related technology. In 1983 he became chief scientist for the telecommunications company GTE. He began advising the nation's national security leaders in the 1950s, among other tasks serving on the President's Foreign Intelligence Advisory Board and the Scientific Advisory Board of the National Security Agency. His first marriage, to Allison Gilman Selfridge, and his second, to Katherine Bull Selfridge, ended in divorce. Besides his companion, his survivors include their daughter, Olivia Selfridge Rissland of Belmont; three children from his first marriage, Peter Selfridge of Bethesda, Md.; Mallory Selfridge of Eastford, Conn.; and Caroline Selfridge of Saratoga, Calif.; a sister, Jennifer Selfridge MacLeod of Princeton Junction, N.J.; and six grandchildren. Along with producing scholarly papers and technical books, Mr. Selfridge wrote ''Fingers Come in Fives,'' ''All About Mud'' and ''Trouble With Dragons,'' all books for children. At his death he was working on a series of books he hoped might one day become an arithmetic equivalent of summer reading projects for schoolchildren. Mr. Selfridge never stopped theorizing, speaking and writing on what he saw as the future of artificial intelligence. ''I want an agent that can learn and adapt as I might,'' he once told a meeting organized by I.B.M. Such an agent would ''infer what I would want it to do, from the updated purposes it has learned from working for me,'' he went on, and ''do as I want rather than the silly things I might say.'' http : // www.nytimes.com Correction An obituary on Thursday about Oliver G. Selfridge, an innovator in early artificial intelligence, misspelled the surname of the pioneer theorist of computer science with whom he studied at M.I.T. He was Norbert Wiener, not Weiner. Correction-Date: December 6, 2008 Graphic PHOTO: Oliver G. Selfridge (PHOTOGRAPH BY CAROLINE SELFRIDGE) Load-Date: December 4, 2008 End of Document Artificial Intelligence, With Help From the Humans The New York Times

Time: 13/05/2013  
To the degree there was a human face of Watson, the ''Jeopardy!'' computer champion, it was David Ferrucci. He was the I.B.M. researcher who led the development of Watson, an artificial intelligence engine. The goateed computer scientist was always articulate and at ease in front of a camera or a microphone. Dr. Ferrucci has left I.B.M. to join the giant hedge fund Bridgewater Associates. And the weight of the Watson-related fame, it seems, played a role. ''I was so linked to the Watson achievement, and where I.B.M. was taking it, that I felt I was almost losing my identity,'' he said in a recent interview. After Watson beat the best human Jeopardy champions in 2011, its artificial intelligence technology was directed toward new challenges, like assisting doctors in making diagnoses in a research project at the Cleveland Clinic. Dr. Ferrucci led that next-generation Watson research as well. But he went to Bridgewater at the end of last year. Bridgewater, a private company, made no announcement of its new hire. Yet word of Dr. Ferrucci's departure from I.B.M. has been circulating among scientists in the artificial intelligence field. And I caught up with him recently for an interview, supplemented by a lengthy e-mail he titled, ''My Reflections.'' Dr. Ferrucci, 51, said he had ''a great, great career'' at I.B.M., spanning 20 years, and ''they paid me very well.''He said he ''never imagined myself at a hedge fund,'' but eventually the appeal of working in a smaller environment in an entirely new field for him -- applying artificial intelligence to macroeconomic modeling -- won him over. Dr. Ferrucci said the more recent work he was doing at I.B.M., called WatsonPaths, was the direction he thought artificial intelligence research needed to go to make further advances, and it was the approach he saw Bridgewater pursuing to economic modeling. Much of artificial intelligence today, he said, focuses on mining vast amounts of data to make predictions. Those predictions are based on statistical probabilities and patterns -- a certain symptom is highly correlated with a certain disease, for example. ''But in a purely data-driven approach, I can't explain my decisions,'' Dr. Ferrucci said. ''People are so enamored with the data-driven approach that they believe correlation is sufficient.'' The Big Data formula, he noted, has proved to be ''incredibly powerful'' for tasks like natural-language processing -- a central technology behind Google search, for instance. WatsonPaths, by contrast, builds step-by-step graphs, or paths, that trace possible causes rather than mere statistical correlations. In the case of medicine at the Cleveland Clinic project, for example, the paths go from an observation of symptoms to a conclusion about the diagnosis of a disease and treatment. That approach is a hybrid of the Big Data tools, which sift through troves of medical literature, and logic tools to identify likely chains of inference -- what humans see as logical explanations for the ''why'' of things. The approach is also a step in the direction of classic artificial intelligence, which relied on knowledge rules and relationships, to create so-called expert systems. The blend combines elements of what Dr. Ferrucci termed ''my 30-year journey in A.I.'' At Bridgewater, Dr. Ferrucci sees a similar path to modeling the economy and markets. ''Their approach to investment,'' he wrote in his e-mail, ''is based on a fundamental understanding of how the global 'economic machine' works.'' Its models, he added, are ''informed by but not blindly driven by the data.'' The opportunity, Dr. Ferrucci wrote, is to build ''predictive systems that fit perfectly with my interests. How cool is it to imagine a machine that can combine deductive and inductive processes to develop, apply, refine and explain a fundamental economic theory?'' Cool, indeed. If successful, perhaps Bridgewater could share its findings with the Fed and the Treasury rather than merely trading for its own account. In the realm of policy, economic modeling and forecasting could use some help. This is a more complete version of the story than the one that appeared in print. http : // bits.blogs.nytimes.com/2013/05/06/david-ferrucci-life-after-watson/ Graphic PHOTO: David Ferrucci, the I.B.M. researcher who led the development of Watson, has joined the hedge fund Bridgewater Associates. (PHOTOGRAPH BY OZIER MUHAMMAD/THE NEW YORK TIMES) Load-Date: May 13, 2013 End of Document A Future of Tech Magic The New York Times

Time: 28/11/2010  
and only" is a familiar phrase to Donna Auguste. The first member of her family to graduate from college, she was also the first black woman to enter the Ph.D. program in computer science at Carnegie Mellon University. And in her chosen field, one dominated by white males, she is a definite rarity. Until last month, she managed the elite team of programmers who helped create Apple Computer's Newton pen-based computer, and this month she starts work as a researcher at U S West's Boulder, Colo., advanced technology group developing multimedia technology for interactive cable television. To be sure, black women are scarce at the top of any field, but the dominance of white males is especially pronounced in computer engineering, a science that emerged during World War II and remained largely captive to I.B.M. and the aerospace industry until the invention of the personal computer. But what makes Ms. Auguste even more unusual is that for a decade she has thrived in Silicon Valley's intense computer hacker culture, made up almost exclusively of young men with a passion for cool technology. "Fi," as Ms. Auguste has been called all her life (the nickname comes from the rock song "Charlie Brown"), has her own passion for building "cool technology" -- technology that can make a difference for people. But she also has a flair for managing the teams that come together, with an extraordinary commitment, to build the software that breathes life into the machines. "What will keep me at work until 5 A.M.," she said, "is the people I work with." When she arrived at Apple in 1990, it meant diving into the troubled, half-finished Newton project and submerging herself in a world of computer designers who take 90-hour work weeks for granted and think nothing of back-to-back all-night sessions. Today many team members give the 35-year-old Ms. Auguste sole credit for holding the project close to its deadlines. "I worked very hard to try to give people the skills needed to estimate the time it would take them to do things," she said. At the same time, she navigated the intense political infighting that invariably accompanies such projects. She was also the facilitator at key design meetings. "There is a strong sense of rhythm" in design meetings, at which half a dozen engineers toss around ideas, Ms. Auguste said. "Initially one or two people will have something to say, but eventually everyone is engaged and you can feel the intensity." She guided this process with a force of personality that left many co-workers awestruck. "She worked her heart out," said Lynnea Johnson, an Apple executive. "This is a woman with great passion." She also bruised some egos. As software engineering manager for the Newton, Ms. Auguste was charged with orchestrating the myriad inevitable clashes and compromises between engineering and marketing. Marketing always turns up features that customers want that have to be balanced against what can realistically be done while staying on schedule. "She was a lousy diplomat," said Stephen Capps, a Newton designer who worked closely with Ms. Auguste. "But this is obviously preferable to the inverse approach that is taken by most managers. They'd much rather think everybody likes them than actually get anything done." Mr. Capps, Newton's technical visionary and lead designer, became a close friend of Ms. Auguste. Frequently, still at work well after midnight, they would chat about how things were going. The child of Creole parents, Ms. Auguste moved with her family from Louisiana to Berkeley, Calif., when she was 3 years old. Her father opened a restaurant, but several years later separated from her mother, Willie Mae Fruge, who during the next several decades raised four daughters, sometimes holding down two and three jobs. Ms. Auguste's background includes Native American roots -- the Choctaw and Blackfoot tribes -- and her experience growing up in the black community has led her to place great importance on diversity. It was an experience that translated directly into building a more effective engineering team at Apple. When she joined the team, about six months after Apple's chairman, John Sculley, had given Newton the go-ahead, she found an insulated group. "There weren't any people who didn't already know people on the Newton team when they joined the group," she said. "I didn't think it was healthy." She immediately set about hiring engineers from outside this small circle, bringing in blacks and women in the process. "Most of my management and leadership skills I learned in the black and Creole communities," she said. "Diversity was something I just took for granted." She refined the interviewing process to reach beyond the usual applicants, and looked much farther afield than Apple usually does. TRAINED at one of the leading centers for artificial intelligence research, Ms. Auguste has seen both the hype and the reality behind the quest to build machines that mimic human talents. At Carnegie Mellon, she studied with Allen Newell, a top artificial intelligence researcher. While at school she worked summers at Xerox's Palo Alto Research Center and in 1983 moved to Intellicorp, a Silicon Valley start-up that was part of the rush to try to commercialize "expert system technologies," artificial intelligence programs that had been developed at research laboratories and universities in the 1960's and 1970's. By the mid-1980's, the technology had proved premature for many commercial markets, and what became known as the "A.I. winter" descended on the companies that had promised a computing revolution. "There was a big dive in credibility," Ms. Auguste said. "People were expecting miracles, and their expectations weren't aligned with what could really be done." However, she found that when she worked closely with some corporate customers, they were able to achieve results. One bright spot was a project with 3M. That company had an expert scientist who knew virtually everything there was about adhesives. He was about to retire, taking his wealth of knowledge with him, but Ms. Auguste helped 3M researchers create a data base that captured his specific knowledge. Still, after seven years at Intellicorp, she found herself unwilling to sign up for another product development cycle. She left and spent almost two months bicycling alone and staying at youth hostels in rural Japan, once again confronting the "first and only" phenomenon. Curious Japanese children who had never seen a black person would ask to touch her skin and sometimes try to see if the color would rub off. But the rural Japanese were also warm and friendly. In every community, she said, she found herself treated as a special guest. Often when people learned she was an American, they would go to great lengths to find coffee for her -- though in fact she rarely drinks it. SHE had a different experience when, after joining Apple, she met with Japanese on business. She frequently found male Japanese engineers and executives unable to comprehend the idea of a black female as software manager. They were even more stunned when they found she spoke Japanese. "I wouldn't call it sexism," she said. "Just absolute disbelief." She could, she found, build mutual respect in one-on-one situations, but each new relationship required "a reset." Silicon Valley hasn't been a perfect world either. Here discrimination usually takes more subtle, but disturbing, forms. "It's very real at Apple," she said. "You meet people who do things that are foolish. Sometimes I would have to deal with people who would get my blood pressure going." Inevitably, though, the larger challenges at Apple remained the technical ones. Newton was one of the first low-cost products whose engineers tried to build in artificial intelligence. And like earlier products, it has been heavily criticized. When Newton was shipped this summer, Ms. Auguste said, she ignored early press accounts that poked fun at it because of its imperfect handwriting recognition, instead focusing her attention on the experiences and complaints of the first Newton customers. In September, just weeks after finishing a grueling drive to finish the Newton software, she went back to work with her team of programmers fixing serious bugs. She now feels that while it is not perfect, the Newton project accomplished something. "Out of this research," she said, came "something that is really useful." Once Newton hit the market, though, Ms. Auguste paused and thought about her life, and the hectic Silicon Valley scene, and decided to move to Boulder, in large measure to leave behind an increasingly urban California. Unlike her three sisters, whom she calls "city people" (they all live in the San Francisco area), she is drawn to solitude and the mountains. While at Apple she once spent a year living in the Santa Cruz Mountains overlooking Silicon Valley and she has found she misses outdoor living. Outside work, Ms. Auguste is a devoted musician. She plays guitar, piano and percussion -- often using a computer to create arrangements for her church choir -- and has a passion for the gospel music of her youth. Her own research interest is in exploring gospel and Native American music, trying to extend conventional European notation systems to more effectively capture the dynamics of these oral musical traditions. Donna Auguste Born: Sept. 11, 1958; Beaumont, Tex. Education: Undergraduate, University of California at Berkeley; graduate studies in computer science, Carnegie Mellon University. Family: Single. Recent reading: The Bible. Ideal vacation: Any place with solitude -- and horses to ride. Car: Trading Volvo wagon for Jeep Cherokee. Computer: "A Newton and too many Macs to name." Graphic Photos: Donna Auguste, who managed a team that helped design the Newton, with her creation. Ms. Auguste plays piano and uses a computer to create musical arrangements. (Photographs by Jim Wilson/The New York Times) Load-Date: January 2, 1994 End of Document STANLEY KUBRICK RETROSPECTIVE - Correction Appended The New York Times

Time: 25/06/2010  
The impact of innovation, by its nature, is unpredictable. But the pattern by which new technologies and high-tech businesses create jobs across the economy is well established. Take the Internet and Google. The search giant employs thousands of people -- programmers, mathematicians, statisticians, marketing and sales people, administrators and managers. But its success ripples to create other jobs as well: service workers and suppliers of everything from computers to food. Real estate brokers and car dealers have benefited from Google's wealth. More broadly, the spread of Internet technology has meant that most companies have their own Web sites. The companies hire software programmers, computer technicians, graphics designers and online advertising salespeople. And the job-creating ripples continue. Smarter computing technology, experts say, ought to make the most skilled workers -- in science, the arts and business -- even more productive and prosperous by freeing them from routine tasks. Their prosperity translates to spending that creates jobs in stores, schools, gyms, construction and elsewhere. Artificial intelligence, experts say, should also generate new jobs even as it displaces others. The smart machines of the future will need programming, servicing and upgrading -- work done, perhaps, by a new class of digital technicians. The intelligent machines, experts add, will be specialists in a field, like the medical assistant project at Microsoft. They must be tailored with specialized software, perhaps igniting a new industry for artificial intelligence applications. Of course, no one really knows just what artificial intelligence will mean for jobs and the economy, but the technology is marching ahead. ''Its potential is far greater than simply substituting technology for human labor,'' said Erik Brynjolfsson, an economist at the M.I.T Sloan School of Management. STEVE LOHR http : // www.nytimes.com Load-Date: June 25, 2010 End of Document Redefining the Power of the Gamer The New York Times

Time: 26/10/2014  
Elon Musk, the chief executive of Tesla and founder of SpaceX, said Friday that artificial intelligence is probably the biggest threat to humans.  
Musk, who addressed MIT Aeronautics and Astronautics department's Centennial Symposium for about an hour, mulled international oversight to "make sure we don't do something very foolish," The Washington Post reported.  
He was not specific about any particular threat, but appeared to theorize out loud.  
"With artificial intelligence we are summoning the demon," he said. "In all those stories where there's the guy with the pentagram and the holy water, it's like yeah he's sure he can control the demon. Didn't work out."  
Artificial intelligence uses computers for tasks normally requiring human intelligence, like speech recognition or language translation.  
Large tech companies appear to be excited about the prospects of the technologies if harnessed correctly. Google, like other tech giants such as Facebook, are anxious to develop systems that work like the human brain.  
In January, Google said it purchased the British startup DeepMind, an artificial intelligence company founded by a 37-year old former chess prodigy and computer game designer.  
The American tech giant's London office confirmed a deal had been made but refused to offer a purchase price, which is reportedly $500 million. The company was founded by researcher Demis Hassabis together with Shane Legg and Mustafa Suleyman.  
Hassabis, who is on leave from University College London, has investigated the mechanisms that underlie human memory.  
The Post reported that Musk appeared to be so taken with the artificial intelligence question that he asked the next audience member to repeat their question.  
"Sorry can you repeat the question, I was just thinking about the AI thing for a second," he said.

Time: 09/09/2012  
tends to cascade into the marketplace in waves. Think of personal computers in the 1980s, the Internet in the 1990s and smartphones in the last five years. Computing may be on the cusp of another such wave. This one, many researchers and entrepreneurs say, will be based on smarter machines and software that will automate more tasks and help people make better decisions in business, science and government. And the technological building blocks, both hardware and software, are falling into place, stirring optimism. Michael R. Stonebraker, a pioneer in database research, is one of the optimists. Software used by companies and government agencies -- in products sold by Oracle, I.B.M., Microsoft and others -- descends from research done in the 1970s by Mr. Stonebraker and Eugene Wong, a colleague at the University of California, Berkeley, as well as a team of scientists at I.B.M. Today, Mr. Stonebraker sees an opportunity for new kinds of ultrafast databases. The new software, he explains, takes advantage of rapid advances in computer hardware to help businesses and researchers find insights in the rising flood of data coming from so many sources, including Web-browsing trails, sensor data, genetic testing and stock trading. So, at 68, Mr. Stonebraker is a co-founder and chief technology officer of two start-ups in the field of data-driven discovery, VoltDB and Paradigm4. ''Now is the time,'' says Mr. Stonebraker, who is an adjunct professor at the Massachusetts Institute of Technology's computer science and artificial intelligence laboratory. ''The economics and the technology are ripe.'' The case for optimism is by no means unqualified. The march of these technologies raises social issues, including privacy concerns, and the timing is uncertain. All of the bold predictions in the 1990s that the Internet would disrupt traditional industries like media, advertising and retailing did come true -- a decade later. But a series of related technologies, scientists and entrepreneurs say, has reached a critical mass -- come to a digital boiling point, so to speak -- so that new products and capabilities become possible. The technical ingredients, they note, include powerful, low-cost computing and storage spread across thousands of computers. The digital engine rooms of Google and Amazon are prime examples. Another fast-improving technology involves inexpensive and intelligent sensors, which are crucial to a new breed of automated machines like experimental driverless cars and battlefield drones. Clever software -- notably machine-learning algorithms -- animates much of the current wave of smarter technology. Two well-known examples are found in Watson, the ''Jeopardy''-winning computer from I.B.M., and the movie recommendations on Netflix. ADVANCES in such underlying technologies are fueling the current excitement in fields like artificial intelligence, robotics and data analysis and prediction. ''All parts of the technology pipeline are gearing up at the same time, and that's how you get this explosion of new applications and uses,'' says Jon Kleinberg, a computer scientist at Cornell University. Behind the seeming explosion, experts say, is a process of technology evolution. Paul Saffo, a technology forecaster, compares the process to the evolutionary biology concept known as ''punctuated equilibria'' formulated by the paleontologists Stephen Jay Gould and Niles Eldredge. The idea is that species often evolve in periodic spurts. Yet, they say, there are typically years of progress before a commercial breakthrough in the technological realm. ''Even in Silicon Valley, it takes most technologies 20 years to become overnight successes,'' says Mr. Saffo, a consulting professor at Stanford's school of engineering. The Internet provides a case study of both technology's evolutionary progress and its exponential growth. In 1969, there were only four computers connected to the nascent Internet, compared with roughly a billion computing devices today, from laptops to cellphones, says Edward Lazowska, a computer scientist at the University of Washington. The early increases in connected computers drew scant attention. ''But at some point in the late 1990s,'' Mr. Lazowska says, ''you were going from 4 million to 8 million to 16 million to 32 million to 64 million, and people started to notice that something revolutionary was going on.'' Rocket Fuel is a four-year-old Silicon Valley start-up that uses artificial-intelligence software to place display advertisements for marketers on the Web. The company can not only tailor ads by demographic slices of viewers' ages, gender and interests, but can also use its predictive algorithms to produce campaigns based on results, says George H. John, the company's chief executive. For example, a luxury carmaker might tell Rocket Fuel that it wants to place 100 million ads in the next month, and it will pay the company, say, $80 for generating a sales lead, as evidenced by a potential customer downloading a brochure or filling out an online form. Rocket Fuel is growing fast, having nearly doubled its work force since the start of the year, to 240. So far in 2012, it has handled campaigns for more than 500 advertisers, including BMW, Duncan Hines, Allstate, Pizza Hut and Ace Hardware. It has raised $76 million in venture funding and debt, and its thousands of computers handle 19 billion bid requests a day on ad exchanges. Each online auction for ad space is typically completed in about 100 milliseconds, a tenth of a second. Rocket Fuel, Mr. John says, is using some of the ideas he worked on in the 1990s as a doctoral student focusing on artificial intelligence at Stanford -- research that was supported with government dollars from the National Science Foundation and other agencies, as is so often the case. In the last few years, building a business around those ideas has become achievable and affordable. ''And a lot of it has to do with the underlying technology,'' Mr. John says. FOR Mr. Stonebraker, the hardware advance that opens the door to his start-ups is the striking improvement of solid-state memory, as performance climbs and prices plunge. Solid-state, or flash, memory is most widely known as the lightweight storage technology used in consumer devices like small music players and smartphones. But increasingly, solid-state memory can be used in big computers, holding a hefty database in memory instead of sending data off to be stored on disk drives. According to Mr. Stonebraker, some data-handling tasks can now be completed 50 times faster than with conventional systems. ''Memory is the new disk,'' he says. ''The obvious thing to do is to exploit that technology.'' In the yin and yang of computing, it is software that exploits hardware, enabling a computer to do useful things. And machine-learning programs and other data-sifting software are advancing swiftly. ''There is no point in collecting and storing all this data if the algorithms are not able to find useful patterns and insights in the data,'' says Mr. Kleinberg at Cornell. ''But the software is scaling up to the task.'' GRAPHIC (GRAPHIC BY JOHN HERSEY) http : // www.nytimes.com/2012/09/09/technology/data-driven-discovery-is-techs-new-wave-unboxed.html Load-Date: September 9, 2012 End of Document Paperback Row The New York Times

Time: 27/01/2014  
 Stocks ended a choppy day in the red Monday as concerns about emerging markets and corporate earnings kept investors on edge. The Dow Jones industrial average and the S&P 500 were both dragged lower. But losses were offset by gains in Caterpillar shares. The construction equipment giant reported strong quarterly results and approved a new $10 billion stock buyback program. The Nasdaq slid more than 1% on declines in shares of biotechnology companies such as Celgene and Alexion Pharmaceuticals. The PowerShares QQQ Trust, a widely-held exchange-traded fund that tracks the Nasdaq 100, is now down more than 2% for the year. And some are worried that the ETF will fall even further. "$QQQ is teetering on the edge. We may see a sizable correction begin to unfold," said StockTwits user OptionsElite. And CNNMoney's Tech 30 index fell on weakness in shares of social media companies Twitter, Facebook and LinkedIn. Weak revenue guidance from Apple following the closing bell could weigh on the market on Tuesday as well. Shares were down 5% in extended trading even though earnings topped forecasts. The stock in regular trading Monday on hopes of strong iPhone sales. Last week was a rough one for stocks. The Dow shed around 2% Friday to end the week down 3.5%. The Nasdaq and S&P 500 both closed more than 2% lower Friday. The market's so-called fear gauge, the CBOE Market Volatility Index, or VIX, shot up 25% on Friday, the biggest one-day percentage jump since last year's Boston Marathon bombings. The VIX was down nearly 6% on Monday as the stress eased. But CNNMoney's Fear & Greed index, which looks at the VIX and six other gauges of sentiment, hit a level indicating "Extreme Fear" in the market Monday. Is a correction brewing? Many investors say stocks could be headed for a correction, typically a drop of 10% or more. Following last year's big rally, stock prices -- as measured by how they trade relative to expected earnings -- have risen to levels that are considered slightly expensive. Jack Ablin, chief investment officer at BMO Private Bank, said stocks could slide further if corporate results fail to move the needle. "If earnings and revenue don't move at all, the market could drop 10% or more," he said. While "valuations are a bit stretched," Ablin still expects 2014 to be "incrementally positive" for stocks. So far, corporate earnings have beaten analysts' modest expectations. Of the 123 S&P 500 companies that have reported results through Friday, 68% have had earnings above expectations, according to FactSet Research. Investors will get results from 130 of the companies in the S&P 500 this week. The stock was also one of the top performers in CNNMoney's Tech 30 index. In economic news, new home sales plunged 7% in December from November, according to the Commerce Department. December new home sales were up 4.5% from a year ago. New home sales data can be volatile, and some of the drop could be due to colder-than-normal temperatures last month, said Jim O'Sullivan, chief U.S. economist at High Frequency Economics. Emerging markets in turmoil. Meanwhile, emerging markets extended their recent losses Monday amid worries about an economic slowdown and liquidity shortfalls. Emerging markets have ridden a wave of liquidity over the past few years as central banks in the developed world, including the Federal Reserve, have pumped money into the global economy. But as the Fed begins to scale back its bond buying this year, investors have been pulling money out of emerging markets, prompting some central banks to intervene. The Turkish lira regained some ground Monday after Turkey's Central Bank announced plans to hold an emergency meeting Tuesday. The Argentinian peso has been under heavy pressure since the nation's central bank devalued the currency Thursday in a bid to jump start growth. India's rupee has also been hit hard. Investors have also been worried about China, the world's second largest economy, following a disappointing report on manufacturing activity last week and ongoing worries about the nation's financial sector. Despite the flight from emerging markets, the market panic does not appear to be spreading. "Does look though to just be $EEM contagion and not something much worse, overall paradigm doesn't seem to have changed," said LDrogen on StockTwits. Still, the iShares MSCI Emerging Markets ETF is down nearly 10% so far this year. European markets ended lower following heavy losses in Asia overnight. Corporate news: Google announced it acquired London-based artificial intelligence firm DeepMind Technologies. It's the latest in a series of start-up purchases by the tech giant as it looks to beef up its expertise in artificial intelligence and robotics. Google shares were down 2%, adding to a steep slide over the past few days. One trader said investors were selling Google shares to buy Apple in anticipation of strong results. "Anyone who thinks biggest $GOOG selloff in recent memory not connected to $AAPL ER is delusional. Everyone going to cash, just waiting..." said kleo. Another trader warned that speculating in Apple shares ahead of earnings reports can be dicey. And based on how Apple was faring following its release, that trader turned out to be right. "$AAPL Investors have got burned with 'sell the news' with Apple on many announcements and earnings. More often than not," said betachaser. Sony shares slid after the firm's debt rating was downgraded to 'junk' by Moody's, with the agency warning that profitability at the tech company would likely remain weak and volatile. Shares of Vodafone tumbled after AT&T said Monday it would not purchase the British telecom company. There had been recent speculation that a bid was imminent. TM & © 2014 Cable News Network, Inc., a Time Warner Company. All rights reserved. Notes Update 4:40. Adds Apple earnings and stock reaction. Load-Date: January 28, 2014 End of Document Peter Thiel: Robots don't threaten middle class jobs CNN Wire

Time: 27/01/2014  
 Investors were hoping to claw back some ground Monday following a week of losses. U.S. stock futures edged higher ahead of the open, while global markets remained under pressure. Last week was a rough one for U.S. stocks. The Dow Jones industrial average shed around 2% Friday to end the week down 3.5%. The Nasdaq and S&P 500 both closed more than 2% lower Friday, and also posted losses for the week. Emerging markets extended recent losses Monday amid worries about an economic slowdown and liquidity shortfalls. "So the tide is coming out of emerging markets," said Dominic Rossi, chief investment officer for Fidelity Worldwide Investment, in a market report. "The prospect of the end of cheap money in the west, with the certainty of the end of even cheaper money in China, is forcing up the cost of capital across the [emerging markets] asset class." Corporate news: Google announced it acquired London-based artificial intelligence firm DeepMind Technologies. It's the latest in a series of start-up purchases by the tech giant as it looks to beef up its expertise in artificial intelligence and robotics. Sony shares lost 2.3% in premarket trading after the firm's debt rating was downgraded to 'junk' by Moody's, with the agency warning that profitability at the tech company would likely remain weak and volatile. Shares of Caterpillar rallied after the company easily blew past earnings and sales estimates, and approved a new $10 billion stock buyback program. Apple is scheduled to report results after the closing bell. In economic news, data on new home sales will be announced at 10 a.m. ET. World markets: European stocks fell in morning trading, with London FTSE 100 index losing 1%. Shares of Vodafone tumbled 5% in London after AT&T said Monday it would not purchase the British telecom company. There had been recent speculation that a bid was imminent. British oil and gas firm BG Group was another weak spot, with shares plunging 15% after the company warned investors that it faces challenging business conditions. Asian markets ended in the red. The biggest loser was Japan's Nikkei index, which closed down 2.5%. TM & © 2014 Cable News Network, Inc., a Time Warner Company. All rights reserved. Notes updated 8:03 am ET with Caterpillar Load-Date: January 28, 2014 End of Document Anyone can use this powerful facial-recognition tool - and that's a problem CNN Wire

Time: 14/10/2005  
Citing a Lack of Cash, Refco Says It Will Suspend One of Its Businesses Refco, one of the world's largest futures and commodities brokerage firms, said that it would suspend operations at one of its capital markets business because of a lack of cash. The announcement, coupled with another cut in its credit ratings, sent Refco's bonds into a tailspin, a sign that creditors believe the company will default. [Page C1.] Even as the situation worsened at Refco, bond and commodities markets seemed to shrug, with important indicators of market unease showing only slight increases over those of recent sessions. [C1.] Provision in Bankruptcy Law Causes Concern A requirement of the new bankruptcy law that sends Americans into credit counseling before they can erase their debts is drawing fire from consumer advocates, bankruptcy lawyers and financial educators, who are concerned that lenders are subsidizing the advice. [A1.] Ad Campaign Stresses AOL.com as a Free Web Portal Time Warner, parent of America Online, is spending an estimated $50 million on a campaign to promote AOL.com as a free Web portal. The campaign has been in development for months, ever since AOL's parent, Time Warner, decided to shift strategies and offer at no cost much of the content and features that had been available only to subscribers of America Online. The reason is that despite all the elaborate previous changes to the subscription service, paying users continue to flee. Stuart Elliott: Advertising. [C4.] Snow Encourages Chinese to Spend and Borrow Treasury Secretary John W. Snow, touring a village in the Sichuan province, urged China to take lessons from the United States on how to spend more, borrow more and save less. He argued that China's consumers and entrepreneurs are badly in need of financial sophistication offered by American banks and investment banks. [C1.] U.S. Regulators File Suit Against Hedge Fund Federal regulators filed suit against Wood River Capital Management, a hedge fund, claiming that its manager deceived his investors by not disclosing his high concentration in a rapidly sinking stock. [C4.] A Debate Over Coastal Oil Drilling Oil companies are pushing for the right to drill in coastal areas that have been off limits for more than two decades, reigniting a debate over whether to lift a federal ban on drilling along most coastlines. [C1.] Samsung Pleads Guilty in Price-Fixing Case Samsung Electronics, the world's largest maker of computer memory chips, agreed to plead guilty and pay a $300 million fine for participating in a global conspiracy to fix prices, federal prosecutors said. [C3.] U.S. Trade Deficit Widened in August The nation's trade deficit worsened in August, all but erasing a brief improvement in July, the government reported. Another report showed that import prices surged last month as the cost of oil, natural gas and other energy products jumped after the two severe hurricanes in the Gulf Coast. [C3.] Dow and S.&P. 500 Dip Slightly as Nasdaq Rises The Dow Jones industrial average fell 0.32, to 10,216.59. The Standard & Poor's 500-stock index lost 0.84, or 0.07 percent, to 1,176.84, and the Nasdaq composite index climbed 9.75, or 0.48 percent, to 2,047.22. [C8.] Robot Race Renews Interest in Artificial Intelligence The five robots that successfully navigated a 132-mile course in the Nevada desert last weekend demonstrated the re-emergence of artificial intelligence, a field that for decades has overpromised and underdelivered. [C3.] Court Rules Against Law Firm in Asbestos Cases A federal appeals court ruled that a law firm faced a conflict of interest when it advised a company coping with asbestos claims after it had represented some of the claimants in asbestos suits against other companies. [C3.] Parent of Mesaba Airlines Files for Chapter 11 The regional carrier Mesaba Airlines, a unit of Mair Holdings, said that it had filed for bankruptcy protection, a victim of Northwest's cuts as the big airline shrinks to try to fix its own financial problems. Mair said the filing was prompted by ''cash shortages and significant fleet changes and uncertainties'' related to Northwest Airlines, which is Mesaba's only customer and under bankruptcy protection itself. [C3.] More Lawyers Become Outsourcing Consultants Law firms are taking aim at what has been a lucrative and growing field for consultants: outsourcing. [C6.] A Golden Age for London's Financial District London's financial industry is enjoying a particularly heady boom that may put New York, at least for the moment, to shame. [C6.] Tax Claim Causes Tribune Profit to Fall 80% The Tribune Company said that its quarterly profit fell 80 percent after it set aside $150 million to pay a tax claim. [C4.] http : // www.nytimes.com Graphic PhotoGraph shows Mair share prices since July, 2005. Load-Date: October 14, 2005 End of Document No Headline In Original The New York Times

Time: 12/08/2012  
has been the crossover year for Big Data -- as a concept, as a term and, yes, as a marketing tool. Big Data has sprung from the confines of technology circles into the mainstream.First, here are a few, well, data points: Big Data was a featured topic this year at the World Economic Forum in Davos, Switzerland, with a report titled ''Big Data, Big Impact.'' In March, the federal government announced $200 million in research programs for Big Data computing. Rick Smolan, creator of the ''Day in the Life'' photography series, has a new project in the works, called ''The Human Face of Big Data.'' The New York Times has adopted the term in headlines like ''The Age of Big Data'' and ''Big Data on Campus.'' And a sure sign that Big Data has arrived came just last month, when it became grist for satire in the ''Dilbert'' comic strip by Scott Adams. ''It comes from everywhere. It knows all,'' one frame reads, and the next concludes that ''its name is Big Data.'' The Big Data story is the making of a meme. And two vital ingredients seem to be at work here. The first is that the term itself is not too technical, yet is catchy and vaguely evocative. The second is that behind the term is an evolving set of technologies with great promise, and some pitfalls. Big Data is a shorthand label that typically means applying the tools of artificial intelligence, like machine learning, to vast new troves of data beyond that captured in standard databases. The new data sources include Web-browsing data trails, social network communications, sensor data and surveillance data. The combination of the data deluge and clever software algorithms opens the door to new business opportunities. Google and Facebook, for example, are Big Data companies. The Watson computer from I.B.M. that beat human ''Jeopardy'' champions last year was a triumph of Big Data computing. In theory, Big Data could improve decision-making in fields from business to medicine, allowing decisions to be based increasingly on data and analysis rather than intuition and experience. ''The term itself is vague, but it is getting at something that is real,'' says Jon Kleinberg, a computer scientist at Cornell University. ''Big Data is a tagline for a process that has the potential to transform everything.'' Rising piles of data have long been a challenge. In the late 19th century, census takers struggled with how to count and categorize the rapidly growing United States population. An innovative breakthrough came in time for the 1890 census, when the population reached 63 million. The data-taming tool proved to be machine-readable punched cards, invented by Herman Hollerith; these cards were the bedrock technology of the company that became I.B.M. SO the term Big Data is a rhetorical nod to the reality that ''big'' is a fast-moving target when it comes to data. The year 2008, according to several computer scientists and industry executives, was when the term ''Big Data'' began gaining currency in tech circles. Wired magazine published an article that cogently presented the opportunities and implications of the modern data deluge. This new style of computing, Wired declared, was the beginning of the Petabyte Age. It was an excellent magazine piece, but the ''petabyte'' label was too technical to be a mainstream hit -- and inevitably, petabytes of data will give way to even bigger bytes: exabytes, zettabytes and yottabytes. Many scientists and engineers at first sneered that Big Data was a marketing term. But good marketing is distilled and effective communication, a valuable skill in any field. For example, the mathematician John McCarthy made up the term ''artificial intelligence'' in 1955, when writing a pitch for a Rockefeller Foundation grant. His deft turn of phrase was a masterstroke of aspirational marketing. In late 2008, Big Data was embraced by a group of the nation's leading computer science researchers, the Computing Community Consortium, a collaboration of the government's National Science Foundation and the Computing Research Association, which represents academic and corporate researchers. The computing consortium published an influential white paper, ''Big-Data Computing: Creating Revolutionary Breakthroughs in Commerce, Science and Society.'' Its authors were three prominent computer scientists, Randal E. Bryant of Carnegie Mellon University, Randy H. Katz of the University of California, Berkeley, and Edward D. Lazowska of the University of Washington. Their endorsement lent intellectual credibility to Big Data. Rod A. Smith, an I.B.M. technical fellow and vice president for emerging Internet technologies, says he likes the term because it nudges people's thinking up from the machinery of data-handling or precise measures of the volume of data. ''Big Data is really about new uses and new insights, not so much the data itself,'' Mr. Smith says. I.B.M. adopted Big Data in its marketing, especially after it resonated with customers. In 2008, Mr. Smith's team put up a Web site to explain the Big Data theme, and the site has since been greatly expanded. In 2011, the company introduced a Twitter hashtag, #IBMbigdata. I.B.M. has a Big Data newsletter, and in January it published an e-book, ''Understanding Big Data.'' Since its founding in 1976, SAS Institute Inc., the largest privately held software company in the world, has made software that sifts through databases, looking for nuggets of value. SAS, based in Cary, N.C., has seen many a marketing term in its field, including ''data mining,'' ''business intelligence'' and ''data analytics.'' At first, Jim Davis, chief marketing officer at SAS, viewed Big Data as part of another cycle of industry phrasemaking. ''I scoffed at it initially,'' Mr. Davis recalls, noting that SAS's big corporate customers, like banks and insurance companies, had been mining huge amounts of data for decades. But Big Data seeks to tap all that Web data outside corporate databases as well. And as SAS's technology has moved to exploit these Internet-era data assets, its marketing has changed, too. Last year, SAS started adopting Big Data and ''Big Data analytics,'' along with a term it has been using for years, ''high-performance analytics.'' In May, the company appointed a vice president for Big Data, Paul Kent. ''We had to hop on the bandwagon,'' Mr. Davis says. IT may seem marketing gold, but Big Data also carries a darker connotation, as a linguistic cousin to the likes of Big Brother, Big Oil and Big Government. ''If only inadvertently, it does have a sinister flavor to it,'' says Fred R. Shapiro, editor of the Yale Book of Quotations. Big Data's enthusiasts say the rewards far outweigh the risks. Still, smart technologies that promise to observe, record and make inferences about human behavior as never before should prompt some second thoughts -- both from the people building those technologies and from the people using them. http : // www.nytimes.com/2012/08/12/business/how-big-data-became-so-big-unboxed.html Graphic DRAWING (DRAWING BY LLOYD MILLER) Load-Date: October 1, 2012 End of Document Modest Debut of Atlas May Foreshadow Age of 'Robo Sapiens' The New York Times

Time: 24/05/2009  
two decades the development of artificial intelligence - the use of computers to imitate learning and reasoning processes and solve problems - was largely confined to a few university computer centers. Now artificial intelligence, or A.I., is making its way into the research and development laboratories of Fortune 500 companies across the nation. The change has opened doors for people like Gregg Vesonder, 32 years old, who is not your average computer programmer. Five years ago, after finishing his Ph.D. in cognitive psychology at the University of Pittsburgh, Mr. Vesonder turned down an academic position for a job at Bell Laboratories' research center in Whippany, N.J. The system he created, Automated Cable Expertise, or ''ACE,'' enables a computer to monitor telephone cable repair and recommend maintenance. It is already in use in Fort Worth, Tex. Mr. Vesonder is one of a relatively tiny force of young Ph.D.'s and university professors who also work at the commercial vanguard of a technology that most believe will have enormous ramifications for the computer industry. International Data Resources, a consulting firm in Norwalk, Conn., estimates that the market for artificial-intelligence products, now less than $100 million, could be worth $8 billion by 1990. And many experts predict that within the decade there will be little computing that is not somehow affected by the new discipline. Artificial intelligence is a broad term used to describe any program that allows computers to handle functions considered to require intelligence when humans do them. Programs like Mr. Vesonder's ACE are called knowledge-based, or expert systems, because they imitate the work done by experts. Another expert system, designed by Schlumberger Ltd., an oil- production products company, will interpret data from oil-well readings; TRW has created a system called ''Adept,'' which can help military field commanders make tactical decisions in battle. A second major A.I. sector deals with so-called natural language computer programs, which enable computers to recognize and understand English and other written languages and thus obviate some computer-language programs, eliminating the need for many data-processing personnel. Experts estimate that sales of such programs alone could reach $2 billion by the end of the decade. The growing market for this discipline bodes well for the very few qualified to work in it. University officials report that doctoral candidates are increasingly sought by major oil, aerospace and computing companies, as well as by small robotics concerns and a growing number of start-up consulting firms. Employers who seek such programmers agree that it is already a job-hunter's market, and that the industry's expected growth in the next 5 to 10 years could well outstrip the availability of human resources it will require. ''It's a hot area, and there are a lot of companies that are trying to apply it,'' said Rick Reis, assistant director of the Center for Integrated Systems in Palo Alto. ''The numbers of people who are going into the field aren't large, and the demand exceeds the supply considerably.'' Shin-Yee Lu, a research specialist and recruiter for the Exxon Corporation, echoed the phenomenon: ''I will be lucky to find two people by the end of the year.'' The people who enter commercial artificial-intelligence operations still are most notable for their scarcity. Only Stanford, Carnegie-Mellon and the Massachusetts Institute of Technology have sizable A.I. research facilities, and each produces only a dozen Ph.D.'s yearly in A.I.-related fields - typically, computer science or electrical engineering. THIS relative scarcity obtains even though interest in such programs has risen sharply: Carnegie-Mellon, for one, reports that applications for admission to its A.I.-related Ph.D. programs are more than six times what they were in 1976. Some graduates find positions through their universities' job placement offices; according to Robert Wetherall, director of the M.I.T. office of career services, representatives of more big high-technology companies than ever, including Honeywell, United Technologies and Schlumberger, filed through his office last year in search of A.I. programmers. Starting salaries at M.I.T. and other schools average between $40,000 and $50,000, slightly higher than those in other special computing disciplines. But more often, employers and employees acknowledge, jobs result from academic contacts. ''I know most of the people who will be graduating this year with A.I. degrees,'' said Mitchell Marcus, who left M.I.T.'s artificial-intelligence research staff two years ago to develop natural-language programs for Bell Labs. ''The number of people who are doing research and are very good is very small.'' Not all artificial-intelligence programmers have computing or engineering Ph.D.'s, and increasing numbers have little or no A.I. research experience. The A.I. researchers in TRW's Defense Systems Group include Ph.D.'s in philosophy, linguistics and biological engineering; all received in-house training in A.I. ''The common link is that they love knowledge,'' said Edward Taylor, director of requirements analysis for the TRW division. ''They like to twist things around.'' Many experts believe that a company's ability to train programmers from within will soon become a key to success in A.I. research. Indeed, some downplay the importance of specifically trained Ph.D.'s at all, arguing instead that industry demand will soon require that certain A.I. courses be taught at lower educational levels. Some artificial intelligence will actually reduce the need for computing jobs - indeed, the point is a source of controversy in the industry. Henry Levin, a Stanford economist, among others, argues that new products in natural languages will eliminate many jobs held by traditional software programmers. For Ph.D.'s specifically trained in artificial intelligence, the long-term employment outlook appears secure but not dynamic. Most believe that Ph.D.'s will remain in demand but will never account for a significant portion of the field's total employment. ''It's not a field that's going to employ thousands of people right now because it's not production-oriented,'' said Mr. Reis of the Center for Integrated Systems. ''And once it is production-oriented, you'll have engineers, not Ph.D.'s, putting A.I. systems together.'' Graphic drawing End of Document Brainy Robots Start Stepping Into Daily Life - Correction Appended The New York Times

Time: 16/06/2011  
Symbolics Inc., a struggling technology company in the artificial intelligence business, announced yesterday that it had named Jay Wurts chairman and chief executive. Symbolics, which is based in Cambridge, Mass., has been run since February on an interim basis by Ronald L. Derry as president and chief executive. Mr. Derry will continue as president. The company went through a management shake-up that saw its chairman and chief executive, Russell Noftsker, and its president, Brian E. Sear, resign. Symbolics has been hurt by losses. In the fiscal quarter ended April 3, it lost $4.9 million on revenue of $17.4 million. The company has also laid off 225 of its 640 employees. Mr. Wurts, 40, will have the job of reversing these fortunes. The artificial intelligence industry in general has been going through a retrenchment, with setbacks stemming from its failure to live up to its promises of making machines that can recognize objects or reason like a human. Symbolics sells special purpose computers and software for artificial intelligence applications. Symbolics ''has more technology than most companies many times its size and just needs to become more effective in delivering it in forms its customers want,'' Mr. Wurts said yesterday. ''We have a golden opportunity to continue as the market leader.'' Mr. Wurts's major accomplishment has been handling the rapidly changing technology and growth of Management Decisions Systems Inc., a company he founded in 1979. ''The management problems at Symbolics are similar to the ones I've had in my previous company,'' he said. ''I've been through them all before.'' That company, a marketer of data base software, built revenues to $25 million and was sold in 1985 to Information Resources Inc. for $47 million. Since then, Mr. Wurts has taken time off and has been investing in and working with start-up companies, serving as chairman of two of them. Mr. Wurts holds a bachelor of science degree in electrical engineering from the Massachusetts Institute of Technology and has also studied at its Sloan School of Management. End of Document A Future of Tech Magic The New York Times

Time: 09/08/2013  
there have been thousands of layoffs in some sectors of the computer business in the past two years, the Route 128 region of eastern Massachusetts has been spared the brunt of the downturn. More than just a road from one place to another, Route 128 - a freeway that arcs through the suburbs 10 miles beyond this historic port - is an international symbol of advanced technology like California's Silicon Valley. But while the semiconductor-dependent valley has suffered from volatile demand and Japanese competition, Route 128 has been moving from strength to strength as different industries pick up the slack from those in trouble. ''Route 128 has emerged with the highest concentration of diversified technology in the United States,'' said A. George Gols, a public policy economist at the Cambridge-based consulting firm of Arthur D. Little. A Jumping-Off Point Opened in 1951 to ease traffic in Boston, Route 128 developed first into a high-technology corridor and then into the jumping-off point for development that now stretches from the Rhode Island border into southern New Hampshire and Maine, and from Boston and Cambridge to Interstate 495, a newer ring highway about 15 miles beyond Route 128. Nearly all of the current engines of growth in the region are based on high technology, ranging from Fortune 500 companies such as the Digital Equipment Corporation, the rejuvenated leader of the minicomputer market, and Raytheon, a leading military contractor, to myriad newer computer software companies and medical technology concerns. Service companies geared to high technology-based business, ranging from research consultants to bankers, are also doing well. A number of high-technology companies in the region are producing gloomy headlines. Data General, which has laid off 1,000 people in the past year, and Prime Computer have not bounced back yet from the computer industry slump. Wang lost $30 million in the quarter that ended Sept. 30. Computervision, once the market leader in computer-aided design equipment, is struggling to right itself after falling to third place behind I.B.M. and Intergraph. Polaroid, the world leader in instant photography technology, has stabilized its work force at 12,000, down 8,000 from 1978. Business is stagnating at Symbolics, a pioneer in computers designed for artificial intelligence systems, and slumping for suppliers of equipment to the semiconductor industry such as Genrad. Jobless Rate Is Low Nevertheless, the strong performance of neighboring companies has kept unemployment figures as low as 2 percent in some parts of the region and at just about half the national average over all. The Massachusetts Division of Employment Security expects employment in high technology-based industries and services to expand 30 percent by 1990, with the service sector leading the way, according to Robert Vincent, an agency executive. Most of that will occur in the Route 128 region. Biotechnology and artificial intelligence are the two fields of technology most often cited as offering major growth potential for the region. The area around the Massachusetts Institute of Technology in Cambridge has already been dubbed A.I. Alley because of the number of small companies that have been set up within a short walk of M.I.T.'s Artificial Intelligence Laboratory. Toshiba Moving In Foreign investment is also expected to fuel new growth. Massachusetts has done little to court foreign investment compared with other states, but many high-technology companies come anyway. The latest is Toshiba, the Japanese electrical equipment and electronics giant, which announced last week that it was opening a procurement office in Burlington, a suburb astride Route 128 northwest of Boston. Toshiba buys computers, medical and military electronics and telecommunications equipment from local suppliers. Route 128 itself is undergoing ''commercial gentrification,'' according to Matthew Dwyer, vice president of suburban real estate broking for the Spaulding & Slye Company, one the region's largest realtors. ''Large downtown-based firms, like banks, insurance companies, and mutual funds are looking to move or expand to the suburbs. One twenty-eight is increasingly focusing on the service market.'' Thus, although major electronics companies are still attracted to Route 128, the operations there are most likely to be marketing, administration and distribution facilities. With land at many locations going for more than $1 million an acre, large-scale manufacturing has moved out to Route 495, where prime land costs are one-fifth that much, up to New Hampshire, where there is no income or sales tax, or out of the area altogether. Digital Equipment has built more than 20 plants in the region since its founding in 1957, but fewer than 30,000 of its 100,000 employees work there. Most business and political leaders here say that Route 128's headiest days of growth are behind it. But the high-technology base now has a momentum that makes steady growth likely. The educational establishment, for example, topped by Harvard University and M.I.T. and 200 institutions deep, has long attracted new talent to the area from around the world, providing local businesses with an exceptional recruiting pool, research and inspiration. Now it is also gearing itself to reinforcing high-technology development. Northeastern University offers a special M.B.A. program in high-technology business, while the Babson Institute has made a name for itself in entrepreneurial studies. Graphic Map showing locations of high-tech firms in Boston area End of Document Paid Notice: Deaths WILSON, DAVID ANTHONY III The New York Times

Time: 27/09/2004  
Dollar Rebounds From Drop After Group of Seven Talks The dollar rebounded from a sharp selloff at the opening of Asian trading today, as traders looked beyond the weekend decision of the Group of Seven industrial nations to end a two-year campaign to strengthen the American currency. Traders said that the dollar drew buyers because United States interest rates remain higher than those in Japan and Germany, making the returns on dollar-denominated investments more attractive. [Page D4.] Is Bigger Better for Utilities? Now that Western Resources has won its nine-month takeover battle for Kansas City Power and Light, it may find that it faces a harder task ahead than its management expects. Are mergers the answer to the coming challenges as many states deregulate and open their utilities to outside competitors? Some analysts and consulting firms have found that the strategy may actually pose more risks than provide answers. News analysis. [D2.] Spy Satellites for the Public Commercial spy satellites are about to let anyone with a credit card peer down from the heavens into the compounds of dictators or the backyards of neighbors. [Page A1.] New Niche for Artificial Intelligence Once the exclusive turf of large corporations, research labs and the military, advanced research into artificial intelligence is now driven by the consumer electronics and entertainment industries. The move parallels a similar shift in other areas of the computer industry. [D5.] The Journal's On-Line Experience Of about 700 newspapers with sites on the World Wide Web, only The Wall Street Journal has so far managed to charge subscriptions for access to any part of its on-line daily. The Journal's breakthrough has not answered all the questions about on-line journalism. For one thing, nearly 90 percent of its Interactive Edition's readers left by the time the last free trial subscriptions expired. [D8.] Corman to Sell Film Company The Hollywood producer Roger Corman has agreed to sell Concord New Horizons. The purchase price is said to be $100 million. [D9.] Disappointing Communications Act The Telecommunications Act has failed to encourage more competition or reduce cable and telephone rates. News analysis. [D7.] New Pressure on Public Radio Noncommercial radio stations are being asked to show their relevance to their communities or risk having Federal funds cut off. The demand for accountability is forcing a new discipline on smaller broadcasters. [D8.] Children's TV Looks the Same After the F.C.C. required TV stations to broadcast three hours of educational programs for children a week, regulators spoke of productions that would create an "art" of teaching children with television. Last week, the first new programming schedules appeared but lacked any new art form. In fact, some very old shows have been trotted out. Lawrie Mifflin: Broadcasting. [D8.] A 50's Icon For the 90's Warnaco, the lingerie maker, has gone back 40 years to find a Hollywood sex symbol worth building a line of intimate apparel around. The Marilyn Monroe product line is being promoted in a $5 million campaign, mostly on television, that features classic black-and-white photos. Advertising. [D9.] Chewing Gum's Recipe, Revised To confront the littering problem of used chewing gum, the William Jr. Wrigley Company has received a patent for a product that cuts the time it takes for the gum base to dissolve. Sabra Chartrand: Patents. [D2.] Graphic Chart: "LAST WEEK" Dow Industrials -- 6,855.80 Up 42.71 30-yr. Treasury yield -- 6.70% Down 0.08 The Dollar -- 122.60 yen Up 1.22 Load-Date: February 10, 1997 End of Document NEWS WATCH; Microsoft Outlook Add-On For Wireless Keeps You Posted The New York Times

Time: 23/03/2007  
The Economy The heads of the Senate and House tax delegations neared an agreement on the main elements of a tax overhaul bill. Representative Rostenkowski said that he and Senator Packwood might have a completed package ready to present to the other conferees by noon today. If so, the conference committee should be able to reach a basic accord by the end of the week, when Congress begins a three-week recess, although formal approval cannot come until after Labor Day. [Page D1.] Retail sales inched up 0.1 percent in July. The rise would have been more, but a big drop in auto sales held the total down. Many economists are optimistic about consumer buying in the months ahead. [D1.] Sales of new American-made cars rose 7.4 percent in the Aug. 1-10 period, compared with the period last year. [D6.] A bill to help deal with failures of financial institutions was approved by the Senate Banking Committee. The bill would provide $15 billion over three years to the fund that insures thrift institution deposits, and it would give Federal regulators emergency powers to arrange bank takeovers. [D15.] The House Budget panel is seeking ways to cut $10 billion in Federal spending. [A24.] Companies Charles R. Schwab resigned from the BankAmerica board. Mr. Schwab had become known as the dissident among the ailing bank's directors. He joined the board in 1983 after selling his Charles Schwab & Company discount brokerage to the bank in a deal that made him BankAmerica's largest shareholder, but he has since sold most of his stock. Mr. Schwab said last night that he was leaving the board to give full attention to the brokerage. [D1.] Analysts said that Mr. Schwab's resignation may be a first step in a new effort to buy back his brokerage or even to start a new one. [D15.] Lotus will sell software directly to large corporate customers and will also allow such customers to remove copy-protection devices from the software. [D4.] I.B.M. will sponsor an artificial intelligence project with Carnegie-Mellon University. The company said the three-year effort was ''a major new I.B.M. initiative'' in advanced software. [D4.] Convergent Technologies will lay off 500 of its 1,900 employees and cut executive salaries by 10 percent. [D4.] International Two more Swiss banks will join in making a loan to Mexico. Resolving the snag over the temporary $500 million loan apparently insures the success of a $12 billion financial rescue package being put together for that country. [D8.] Markets The stock market continued its march upward, with the broader market outshining the blue chips. The Dow Jones industrial average added 9 points, to 1,844.49, on top of a two-day gain that totaled more than 50 points. Rising issues outnumbered decliners by better than two-to-one, and the volume, at 156.4 million shares, was one of the heaviest of the summer. [D1.] The credit markets had a strong rally based largely on technical factors but bolstered by hopes of a new round of internationally coordinated interest rate cuts. The price of the 30-year Treasury bond rose nearly a point. [D17.] Yields on certificates of deposit, bank money market accounts and money market funds fell. [D21.] Prices of energy futures rose amid signs that the oversupply of oil may be gradually coming under control. [D14.] Gold and the dollar both had slight declines. Gold was off $1.50, to $384.25, in late New York trading. [D14.] Today's Columns The next wave in automation on Wall Street will involve artificial intelligence systems that could do some rudimentary reasoning about investment choices. Technology. [D2.] Transamerica's renewed focus on insurance is being praised by analysts, but they remain divided on the stock. The conglomerate is selling Budget Rent a Car, one of its nonfinancial units, but divesting two other divisions - an airline and a manufacturer - may prove harder. Market Place. [D8.] End of Document The Searchers The New York Times

Time: 20/04/2013  
The sleek, white offices of the Institute for Coordination of Computer Techniques tower over a group of aging tenements that are still pocked from World War II shellings. The contrast neatly reflects the soaring position that the computer software industry holds in Hungary's otherwise pedestrian economy. Computer Techniques, or Szki, a commercially run software house with annual sales of about $20 million, is one reason why Hungary is emerging as the Soviet bloc leader in software exports. Hungary's industry has carved a niche in Western Europe for its products, which range from computer games like the Chinese Juggler and Caesar the Cat to sophisticated software control programs. Article on computer software industry of Hungary, the Soviet bloc leader in software exports; industry has carved out niche for its products in Western Europe and is now seeking partners in US and Canada; despite software successes, computer production in Hungary continues to suffer from shoddy quality, high costs and limited access to Western components and manufacturing machinery, a result of US technology embargoes (M) The size of Hungary's software exports is unknown, but Balint Domolki, laboratory head at Szki (pronounced ski), said his group's hardware and software deliveries to the West generated about $3 million in revenues last year, 15 percent of total sales. Partners Sought Now, buoyed by their European triumphs, Hungary's software houses are casting about for partners in the United States and Canada. They even envision selling programs there for machines that the United States Government bars them from buying. Nonetheless, despite the country's software successes, computer production in Hungary continues to suffer from shoddy quality, high costs and limited access to Western components and manufacturing machinery, a result of technology embargoes. The United States and its allies ban shipments of certain types of high- technology equipment, like powerful computers of the International Business Machines Corporation and the Digital Equipment Corporation, to Soviet bloc states. The idea is to keep them from using the technology for military purposes. Visitors to Szki's antiseptic hallways are shown a large mainframe processor that engineers here improvised after Western export curbs barred the purchase of a big I.B.M. 370 computer. Antique Hardware Some Hungarian experts maintain that the country's antique hardware is responsible for its inventiveness in software, forcing programmers to squeeze every drop of capacity out of creaky old computers. They concede, however, that it also forces them to ship incomplete software to the West, where it must be refined, causing delays and increased costs. In part, the rapid development of the software industry is also a result of Hungary's efforts to broaden its private-sector economy. Miklos Havass, director of the Computer Applications and Service Company, or Szamalk, another large software house, estimates that one-third of Hungary's software output comes from small, privately owned companies that often consist of one or two computer buffs and an outdated machine. Western analysts give the Hungarians high marks. ''Just the fact that software is developed in Hungary opens doors and gets the attention of people in the industry who know,'' said Robert Lefkowits, a software industry analyst at Infocorp, a Cupertino, Calif., market research firm. Programming in Logic Analysts agree that Hungary's greatest breakthrough has been a remarkable programming language called Prolog, for programming in logic. This is gaining wide favor in the field of artificial intelligence, the process by which computers are programmed to solve problems by choosing among various courses of action. Though its origins date to the 1960's, Prolog led a sheltered existence for years, taking a back seat to an American-born product called Lisp that dominated the field. In the 1970's, however, Hungarian software experts studying in Italy brought home a Prolog version that they adapted for particular problems, such as matching drugs to illnesses and solving design problems in architecture. The real triumph came in late 1981, when Japan's Ministry for International Trade and Industry selected Prolog as the basis of that country's program to develop by 1990 so-called fifth-generation computers capable of artificial intelligence. Last January Szki closed a deal with Logicware Inc., a newly formed Canadian software company, to market a product called MProlog, for Modular Prolog, in North America. End of Document Decide.com Study Questioned The New York Times

Time: 06/12/2011  
He might have been content simply to teach thousands of university students in Uganda how to use computers, assemble them into networks, manage them and write basic software programs. In a poor African country with one of the world's fastest-growing populations and rising Internet use, that alone would have been an enormous achievement. But Venansius Baryamureeba had bigger ideas. In 2005, when he returned home with a doctorate from the University of Bergen in Norway, he was just one of a handful of computer scientists in Uganda. And his timing was right. The largely agricultural economy had been growing by about 7 percent annually, propelling an enormous expansion of the upper middle class and the urban elite's aspirations for advanced training in science and engineering. Emboldened by Uganda's relative peace and prosperity, Dr. Baryamureeba founded a new college that includes departments of computer science and computer engineering at creaky Makerere University, in Uganda's capital, Kampala. At the top of a hill near the university's entrance, overlooking the derelict law school to one side and a derelict school mosque to the other, two gleaming glass buildings went up seemingly without a hitch. So many undergraduates swarmed them that the faculty held classes at midnight to accommodate them. Dr. Baryamureeba wanted more than a vocational school; he also created a graduate program he hoped would someday turn out dozens of Ph.D. scientists who would themselves become college professors and help push the boundaries of global research. Improbably, his vision is gaining traction at Makerere. Young homegrown scientists there are now nearing completion of their Ph.D.'s. And faculty members are carrying out cutting-edge experiments. They are seeking to endow cellphones with the ''intelligence,'' embedded in tiny software programs animated by mathematical algorithms, to identify diseases in crops or malaria in a person's bloodstream. Ernest Mwebaze, a doctoral student and lecturer, said there are still serious obstacles to pursuing such research in Uganda, including unreliable Internet service and power failures. But he also said the potential upside is huge. ''Uganda offers several unique research challenges and problems whose solutions can actually have a greater marginal benefit than, say, solutions to problems in Europe,'' he said. Each Monday, in a laboratory of thrumming computers, Mr. Mwebaze teaches a small class on artificial intelligence to 10 graduate students, highlighting this esoteric field, the subject of his doctorate research. And the potential for Africans trained in Africa to conduct science attuned to the realities of Africa is not limited to computing. ''There's a growing interest in research, and science generally, in the region,'' said Calestous Juma, a Harvard professor who specializes in the study of technology and development. The rapid spread of cellphones has fueled an appreciation among Africans for the practical uses of science and technology. And the children of the African elite are also seeing career possibilities in computing science and engineering, beyond the traditional disciplines of medicine, law and finance or the more typical scientific callings of crop and soil science. ''Computer science appeals to a generation of urban students raised on a diet of digital devices,'' said Chanda Chisala of Zambia Online, a software development company and Internet provider in the Zambian capital, Lusaka. The field also may appeal to chronically underfinanced African universities because the study of computer science is relatively inexpensive. No big atom smashers are needed, as in physics; no giant telescopes, as in astronomy. Computer science in Africa, to be sure, is still held back by the perception that it is preferable to study and work in Europe or the United States, even if that means leaving Africa permanently. This must change for computer science to flourish in the region. Georgia Tech researchers recommended in a study that African educators reinforce efforts to mold computer science curriculum to meet ''local needs.'' A shortage of skilled teachers also remains a problem. The continent's leading computer science departments -- based on research publications -- are all in South Africa. Yet even there, the number of university-level teachers is limited. ''Our C.S. departments are much smaller than counterparts in the U.S.,'' said Bill Tucker, an American who is a senior lecturer at the University of Western Cape. And differing ethical practices in African and American academic institutions complicate matters. When V. S. Subrahmanian, a computer scientist at the University of Maryland, decided to forge a research partnership last year with Nigerian professors, he was enthusiastically received. But when he provided a Nigerian computer center with data compiled by Maryland, the center started selling it. Dr. Subramanian, who thought the data should have been openly available for scholars, found the experience ''very troubling.'' Dr. Baryamureeba's commitment has helped Makerere overcome such obstacles. He now leads the entire university, ensuring that computer science and engineering have high-level support. Partnerships with universities in Norway and the Netherlands have also proved crucial. Graduate students from Uganda have been able to study both at home and abroad. And the European universities promise not to poach them, requiring that the students return to Uganda to get their doctorates. There's also a palpable sense among young scholars that Africa is cool -- and that universities are improving just enough to advance the scientific ambitions of Western scientists. Consider John Quinn, a Scot. He attended Cambridge and received a doctorate in computer science from the University of Edinburgh. Searching for an unconventional research experience, he contacted Makerere just as Dr. Baryamureeba was casting about for international talent to bolster his faculty. Dr. Quinn accepted, and has never looked back. An artificial intelligence research group he formed has received financing from Microsoft and Google. One project involves designing code that turns a cellphone into a sophisticated microscope. He presented his research on diagnosing malaria over the phone at an international conference in San Francisco in August. ''There's a growing awareness of the need to focus, to specialize and to become internationally competitive,'' Dr. Quinn said of himself and his colleagues. One potentially practical and profitable benefit partly explains the interest of computer companies in Dr. Quinn's research: Turning cellphones into cheap microscopes and pattern-recognition devices could help people in the developed world lower costs of instant diagnosis of minor medical problems. So far, Dr. Quinn's reputation has only been enhanced by his work in Uganda, and he's earning decent pay. Postdoctoral salaries for European computer scientists are not that much different from the roughly $3,000 a month Dr. Quinn earns at Makerere. That has him thinking he will stay awhile in Kampala. He'd initially planned to stick it out for two years, but he's now already four years into his African university tenure and sees a lot of running room in computer science -- for himself, and for Africa. http : // www.nytimes.com Graphic PHOTOS: UGANDA : A classroom and a student project at the new computer science college at Makerere University in the capital, Kampala. A Ph.D. program has also begun. (PHOTOGRAPHS BY TADEJ ZNIDARCIC FOR THE NEW YORK TIMES) Load-Date: December 6, 2011 End of Document Approximating Life - Correction Appended The New York Times