Artificial intelligence

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ARTIFICIAL INTELLIGENCE

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Hybrid Wind-Diesel Paper

Abstract***:*** This paper is the introduction to Artificial intelligence (AI). Artificial intelligence is exhibited by artificial entity, a system is generally assumed to be a computer. AI systems are now in routine use in economics, medicine, engineering and the military, as well as being built into many common home computer software applications, traditional strategy games like computer chess and other video games.Researchers tried to explain the brief ideas of AI and its application to various fields. It cleared the concept of computational and conventional categories. It includes various advanced systems such as Neural Network, Fuzzy Systems and Evolutionary computation. AI is used in typical problems such as Pattern recognition, Natural language processing and more. This system is working throughout the world as an artificial brain.Intelligence involves mechanisms, and AI research has discovered how to make computers carry out some of them and not others. If doing a task requires only mechanisms that are well understood today, computer programs can give very impressive performances on these tasks. Such programs should be considered ``somewhat intelligent''. It is related to the similar task of using computers to understand human intelligence

AI involves studying the problems the world presents to intelligence rather than studying people or animals. AI researchers are free to use methods that are not observed in people or that involve much more computing than people can do. We discussed conditions for considering a machine to be intelligent. We argued that if the machine could successfully pretend to be human to a knowledgeable observer then you certainly should consider it intelligent

Keywords**—Ai-Artificial Intelligence**

I. INTRODUCTION

Artificial intelligence (AI) is the intelligence of machines and the branch of computer science that aims to create it. AI textbooks define the field as "the study and design of intelligent agents" where an intelligent agent is a system that perceives its environment and takes actions that maximize its chances of success. John, who coined the term in 1956, defines it as "the science and engineering of making intelligent machines."

Artificial intelligence is a branch of science which deals with helping machines find solutions to complex problems in a more human-like fashion. This generally involves borrowing characteristics from human intelligence, and applying these as algorithms in a computer friendly way. A more or less flexible and efficient approach can be taken depending on the requirements established which influences hoe artificial intelligent behaviour appears.

AI is generally associated with computer science, but it has many important links with other fields such as *maths, psychology, biology, philosophy,* among many others. Our ability to combine knowledge from all these fields will ultimately benefit our progress in quest of creating an intelligent artificial being.

Artificial intelligence includes

1. Games playing: programming computers to play games such as chess and checkers
2. Expert systems : programming computers to make decisions in real-life situations (for example, some expert systems help doctors diagnose diseases based on symptoms)
3. Natural language : programming computers to understand natural human languages
4. Neural networks : Systems that simulate intelligence by attempting to reproduce the types of physical connections that occur in animal brains
5. Robotics : programming computers to *see* and *hear* and react to other sensory stimuli

Currently, no computers exhibit full artificial intelligence (that is, are able to simulate human behaviour). The greatest advances have occurred in the field of games playing. The best computer chess programs are now capable of beating humans. In May, 1997, an IBM super-computer called *Deep Blue* defeated world chess champion Gary Kasparov in a chess match.

In the area of robotics, computers are now widely used in assembly plants, but they are capable only of very limited tasks. Robots have great difficulty identifying objects based on appearance or feel, and they still move and handle objects clumsily. .

Natural-language processing offers the greatest potential rewards because it would allow people to interact with computers without needing any specialized knowledge. You could simply walk up to a computer and talk to it .Unfortunately, programming computers to understand natural languages has proved to be more difficult than originally thought. Some rudimentary translation systems that translate from one human language to another are in existence, but they are not nearly as good as human translators. There are also voice recognition systems that can convert spoken sounds into written words, but they do not *understand* what they are writing; they simply take dictation. Even these systems are quite limited **--** you must speak slowly and distinctly.

AI research is highly technical and specialized, *deeply* divided into subfields that often fail in the task of communicating with each other. Subfields have grown up around particular institutions, the work of individual researchers, and the solution of specific problems, resulting in longstanding differences of opinion about how AI should be done and the application of widely differing tools. The central problems of AI include such traits as reasoning, knowledge, planning, learning, communication, perception and the ability to move and manipulate objects term goals.

In the early 1980s, expert systems were believed to represent the future of artificial intelligence and of computers in general. To date, however, they have not lived up to expectations. Many expert systems help human experts in such fields as medicine and engineering, but they are very expensive to produce and are helpful only in special situations. Today, the hottest area of artificial intelligence is neural networks, which are proving successful in a number of disciplines such as voice recognition and natural-language processing.

I. MOTIVATION

Computers are fundamentally well suited to performing mechanical computation, using fixed programmed rules. This allows artificial machines to perform simple monotonous tasks efficiently and reliably, which humans are ill-suited to. For more complex problems, things get more difficult...unlike humans, computers have trouble understanding specific situations, and adapting to new situations.AI aims to improve machine behaviour in tackling such complex tasks.

Together with this, much of AI research is allowing us to understand our intelligent behaviour. Humans have an interesting approach to problem-solving, based on abstract thought, high-level deliberative reasoning and pattern recognition. AI can help us understand this process by recreating it, then potentially enabling us to enhance it beyond our current capabilities.

II. CLASSIFICATION OF AI

AI is classified in two categories: weak AI and Strong AI.

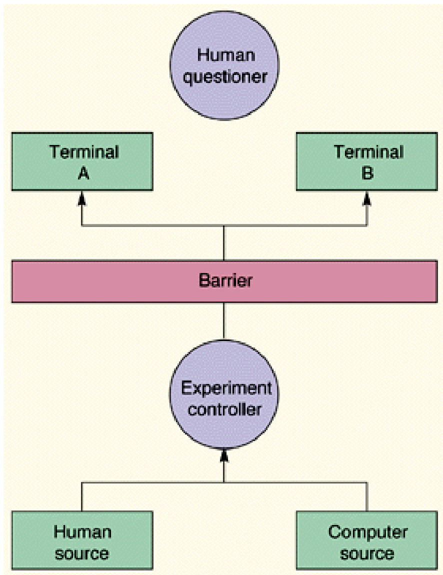
Strong AI is artificial intelligence that matches or exceeds human intelligence-the intelligence of a machine that can successfully perform any intellectual task that a human being can. It is a primary goal of artificial intelligence research and an important topic for science fiction writers and futurists. Strong AI is also referred to as "artificial general intelligence “or as the ability to perform "general intelligent action". Science fiction associates strong AI with such human traits as consciousness, sentience, sapience and self-awareness.

An artificial intelligence system which is *not* intended to match or exceed the capabilities of human beings, as opposed to strong AI, which is. Also known as applied AI or narrow AI.

The weak AI hypothesis: the philosophical position that machines *can* demonstrate intelligence, but do not necessarily have a mind, mental states or consciousness.

III.THE TURING TEST

The Turing test is a test performed on a machine to check its artificial behaviour. The test was introduced by Alan Turing in his 1950 paper *Intelligence, which* gave rise to the question like “can machine think?”



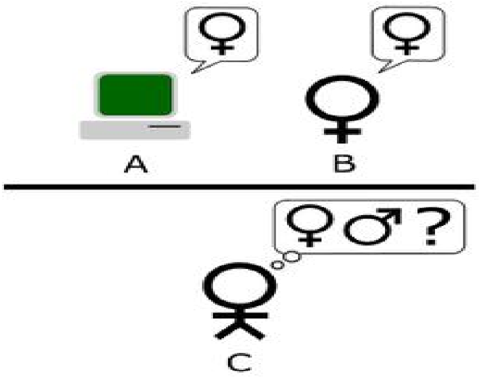
It was also called the imitation game by Alan Turing.

The Turing test compares the human behaviour with that of an intelligent machine to conclude if machines really are able to think like human beings or not.

IV. THE IMITATION GAME

Turing's original game, as we have seen, described a simple party game involving three players. Player A is a man, player B is a woman and player C (who plays the role of the interrogator) is of either sex. In the Imitation Game, player C is unable to see either player A or player B, and can communicate with them only through written notes. By asking questions of player A and player B, player C tries to determine which of the two is man and which is woman. Player A's role is to trick the interrogator into making the wrong decision, while player B attempts to assist the interrogator in making the right one.

Sterret refers to this as the "Original Imitation Game Test", Turing proposes that the role of player A be filled by a computer. Thus, the computer's task is to pretend to be a woman and attempt to trick the interrogator into making an incorrect evaluation. The success of the computer is determined by comparing the outcome of the game when player A is a computer against the outcome when player A is a man. If, as Turing puts it, "the interrogator decide[s] wrongly as often when the game is played [with the computer] as he does when the game is played between a man and a woman", it may be argued that the computer is intelligent.



The Original Imitation Game Test, in which the player A is replaced with a computer. The computer is now charged with the role of the woman, while player B continues to attempt to assist the interrogator. Figure adapted from Saygin, 2000.

The second version appears later in Turing's 1950 paper. As with the Original Imitation Game Test, the role of player A is performed by a computer, the difference being that the role of player B is now to be performed by a man rather than a woman.

"Let us fix our attention on one particular digital computer *C.* Is it true that by modifying this computer to have an adequate storage, suitably increasing its speed of action, and providing it with an appropriate programme, *C* can be made to play satisfactorily the part of A in the imitation game, the part of B being taken by a man?"

In this version, both player A (the computer) and player B are trying to trick the interrogator into making an incorrect decision.

V. AI LANGUAGES

AI have often been written in specialized languages designed strictly for AI. The two big AI languages were PROLOG and LISP. Neither language is used that much in industry, but it is helpful to understand both languages a little because most current AI languages were originally based ion elements of PROOG and LISP.

- IPL was the first language developed for artificial intelligence. It includes features intended to support programs that could perform general problem solving, including lists, associations, schemas (frames), dynamic memory allocation, data types, recursion, associative retrieval, functions as arguments, generators (streams), and cooperative multitasking.
- Lisp is a practical mathematical notation for computer programs based on lambda calculus. Linked lists are one of Lisp languages' major data structures, and Lisp source code is itself made up of lists. As a result, Lisp programs can manipulate source code as a data structure, giving rise to the macro systems that allow programmers to create new syntax or even new domain-specific programming languages embedded in Lisp. There are many dialects of Lisp in use today; among them are Common Lisp, Scheme, and Clojure.
- Prolog is a declarative language where programs are expressed in terms of relations, and execution occurs by running *queries* over these relations. Prolog is particularly useful for symbolic reasoning, database and language parsing applications. Prolog is widely used in AI today.
- STRIPS is a language for expressing automated planning problem instances. It expresses an initial state, the goal states, and a set of actions. For each action preconditions (what must be established before the action is performed) and post conditions (what is established after the action is performed) are specified.
- Planner is a hybrid between procedural and logical languages. It gives a procedural interpretation to logical sentences where implications are interpreted with pattern-directed inference.

AI applications are also often written in standard languages like C++ and languages designed for mathematics, such as MATLAB and Lush.

VI. FUTURE PROSPECTS OF AI

In the next 10 years technologies in narrow fields such as speech recognition will continue to improve and will reach human levels. In 10 years AI will be able to communicate with humans in unstructured English using text or voice, navigate (not perfectly) in an unprepared environment and will have some rudimentary common sense (and domain-specific intelligence).

We will recreate some parts of the human (animal) brain in silicon. The feasibility of this is demonstrated by tentative hippocampus experiments in rats. There are two major projects aiming for human brain simulation, CCortex and IBM Blue Brain.

There will be an increasing number of practical applications based on digitally recreated aspects human intelligence, such as cognition, perception, rehearsal learning, or learning by repetitive practice.

Robots take over everyone’s jobs:

The development of meaningful artificial intelligence will require that machines acquire some variant of human consciousness. Systems that do not possess self-awareness and sentience will at best always be very brittle. Without these uniquely human characteristics, truly useful and powerful assistants will remain a goal to achieve. To be sure, advances in hardware, storage, and parallel processing architectures will enable ever greater leaps in functionality. But these systems will remain mechanistic zombies. Systems that are able to demonstrate conclusively that they possess self awareness, language skills, surface, shallow and deep knowledge about the world around them and their role within it will be needed going forward. However the field of artificial consciousness remains in its infancy. The early years of the 21st century should see dramatic strides forward in this area however.

During the early 2010's new services can be foreseen to arise that will utilize large and very large arrays of processors. These networks of processors will be available on a lease or purchase basis. They will be architected to form parallel processing ensembles. They will allow for reconfigurable topologies such as nearest neighbor based meshes, rings or trees. They will be available via an Internet or WIFI connection. A user will have access to systems whose power will rival that of governments in the 1980's or 1990's. Because of the nature of nearest neighbor topology, higher dimension hyper cubes (e.g. D10 or D20), can be assembled on an ad-hoc basis as necessary. A D10 ensemble, i.e. 1024 processors, is well within the grasp of today's technology. A D20, i.e. 2,097,152 processors is well within the reach of an ISP or a processor provider. Enterprising concerns will make these systems available using business models comparable to contracting with an ISP to have web space for a web site. Application specific ensembles will gain early popularity because they will offer well defined and understood application software that can be recursively configured onto larger and larger ensembles. These larger ensembles will allow for increasingly fine grained computational modeling of real world problem domains. Over time, market awareness and sophistication will grow. With this grow will come the increasing need for more dedicated and specific types of computing ensembles.

VII. ONGOING PROJECTS

Cyc is a 22 year old project based on symbolic reasoning with the aim of amassing general knowledge and acquiring common sense. Online access to Cyc was opened in 2005. The volume of knowledge it has accumulated makes it able to learn new things by itself. Cyc is able to converse with Internet users and acquire new knowledge from them.

Mind.Forth -- shows thinking by the use of spreading activation

Open Mind and mind pixels are similar projects.

These projects are unlikely to directly lead to the creation of AI, but can be helpful when teaching the artificial intelligence about English language and the human-world domain. Artificial General Intelligence (AGI) projects

- Novamente is a project aiming for AGI (Artificial general intelligence).
- Adaptive AI a company founded in 2001 with 13 employees [1].
- Other projects: Pei Wang's NARS project, John Weng's SAIL architecture, Nick Cassimatis's PolyScheme, Stan Franklin's LIDA, Jeff Hawkins Numenta, and Stuart Shapiro's SnEPs.

VIII. ADVANTAGES OF AI

Advantages And Disadvantages: Artificial intelligence would not need any sleep. This would be an advantage because it would not be interrupted from its tasks for sleep, as well as other issues that plague biological minds like restroom breaks and eating.Unemotional consideration of problems. While an artificial mind could theoretically have emotions, it would be better for performance if it were programmed for unemotional reasoning. When people make decisions, sometimes those decisions are based on emotion rather than logic. This is not always the best way to make decisions.Easier copying. Once an artificial mind is trained in a task, that mind can then be copied very easily, compared to the training of multiple people for the same task.There are some disadvantages to the artificial mind:Limited sensory input. Compared to a biological mind, an artificial mind is only capable of taking in a small amount of information. This is because of the need for individual input devices. The most important input that we humans take in is the condition of our bodies. Because we feel what is going on with our own bodies, we can maintain them much more efficiently than an artificial mind. At this point, it is unclear whether that would be possible with a computer system.Which leads to another disadvantageThe inability to heal. Biological systems can heal with time and treatment. For minor conditions, most biological systems can continue normally with only a small drop in performance. Most computer systems, on the other hand, often need to be shut down for maintenance.

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