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The Past, the Present and the Future of Artificial Intelligence

Artificial intelligence, as known as AI, is the imitation or cloning of human intelligence, that allows machines, more specifically computer systems, to perform in an extremely intelligent manner. What exactly does it do then? So basically, an artificially intelligent system perceives its environment in a manner that helps its analytical self in maximizing its chances of success.

Why do we even need artificial intelligence? This question would have definitely arisen in your minds by now. Well, humans are a lazy species. We would love to live in a world where there is minimal human labor and hence, we are able to save ample amounts of time. Also, the data we are producing is in huge chunks. We as humans need something that processes and handles data to minimize the strenuous efforts being put into handling it. This processing and handling of data is called data science. Data Science, in simple words, is the scientific study of data, that stores, records and analyses data for our benefit. Now AI brings in a new perspective towards managing problems and solving them.

It is a branch of science, which deals in helping the machines to behave like human.

John McCarthy "Artificial Intelligence is the science and engineering of making intelligent machines."

Marvin Minsky "AI is the Science of making machine to do things that would require intelligence if done by men. The machines involved are usually digital computers, and they can be 'made' to do things by programming them in a certain way." Today Artificial Intelligence deals with learning, adaptation and intelligent behavior.

In the long term, Artificial Intelligence is going to be something that proves to be a technology that is as intriguing as it is frightful. It is frightening in the sense that it might trick us humans and all that we can imagine- might as well someday become a reality. But at the same time, it also will enhance the capabilities and creativity of humankind. Or maybe one day, AI will take us through time and space, who knows! We just have to wait and watch how the tables turn.

It was 1880's when a great scientist came up with this term and since then a lot of revolutions came in the field which helped the business and the economy to boom. Wait! If you believe in the above lines, you are lost. Rome wasn't built in a day, and so is AI.

Let's start by discussing the history of Artificial Intelligence.

First Alan Turing tests the Artificial Intelligence in 1950 by testing the participating capacity of machine in human like conversation. In 1951, machine "Ferranti Mark I" run the first working Artificial Intelligence program in University of Manchester. Christopher Strachey wrote a program for checkers players while Dietrich Prinz wrote a program for chess players. First time in 1956 John McCarthy focuses on topic "Artificial Intelligence" in Dartmouth Conference and in 1958 he designed a programming language "LISP". An interactive program "ELIZA" was designed by Joseph Weizenbaum in 1965. First

expert system “DENDRAL” was also designed in the same year by Edward Feigenbaum. It uses scientific instrument data to deduce the molecular structure of organic compounds. Ted Shortliffe's demonstrate a program “MYCIN” for medical diagnoses in 1974. It was based on practical rule. The concept was taken from DENDRAL. It opens the new roads for development of expert system, especially for commercial. VaMP and VITA-2, the twin robot cars, were designed by Daimler-Benz and Ernst Dickmanns. They drive over 1000 kms with speeds up to 130 km/h in heavy traffic on Paris highway.

They drive convoying, autonomously, change the lane left and right and pass the other cars. This was the starting of AI games. IBM chess machine “Deep Blue” beats Garry Kasparov, world chess champion, in 1997. ASIMO (humanoid robot), which can walk, move like human, serve like a waiter in restaurant, was designed by Honda in 2005.

In 1980, AI research fired back up with an expansion of funds and algorithmic tools. With deep learning techniques, the computer learned with the user experience.

After all the failed attempts, the technology was successfully established but, until it was in the 2000s that the landmark goals were achieved. At that time, AI thrived despite a lack of government funds and public attention.

2005

- STANLEY, a self-driving car, wins the DARPA Grand Challenge.
- The U.S. military begins investing in autonomous robots like Boston Dynamic's "Big Dog" and iRobot's "PackBot."

2008

- Google makes breakthroughs in speech recognition and introduces the feature in its iPhone app.

2011

- IBM's Watson trounces the competition on *Jeopardy!*.

2012

- Andrew Ng, founder of the Google Brain Deep Learning project, feeds a neural network using deep learning algorithms 10 million YouTube videos as a training set. The neural network learned to recognize a cat without being told what a cat is, ushering in breakthrough era for neural networks and deep learning funding.

2014

- Google makes first self-driving car to pass a state driving test.

2016

- Google DeepMind's AlphaGo defeats world champion Go player Lee Sedol. The complexity of the ancient Chinese game was seen as a major hurdle to clear in AI.

Application of Artificial Intelligence:

Artificial Intelligence research is implemented in Robotics, Expert Systems and Cyborgs.

Expert system which is an Artificial Intelligence application that is most successful. An expert system is a program that acts like a human expert in particular area. MYCIN, an example of expert system, diagnose the blood infection. First expert system was designed in 1970.

Robotics: Another application of Artificial Intelligence, which is extensively used. “Robotics is the science and technology of robots, their manufacture, Application and design. “Robot has intelligence, how to behave in real world environment. Perfect robot has certain abilities like self-evolve, self-diagnose, self-repair, sensing, perception and reasoning etc. “Today industrial robotics is a popular manufacturing methodology and is widely used in many operations, especially in automobile industry. Loading and unloading, pick and place, casting of metals and plastics are some important and ideal operations. Some other important functions are: Welding that is performed either by moving the robots or by keeping the robot stationary and moving the parts.

Assembling, used in production of wide range of items likes electronic equipment and components, circuit boards, automotive subassemblies and household appliances. Non-industrial applications like security, cleaning, food service, and health.

Cyborgs: prominently used application of Artificial Intelligence. Cyborg is a person with plantation of microchips in body to make the body more functional comparative to ordinary human. It is acronym of cybernetic organism. “Cybernetics is a science of communication and control, concerned with comparison of human or animal brain with machine & electronic device.” Steve Mann is a Cyborg, who looks the world as an image printed on his retina. It allows him to transmit his viewpoint live to Internet, block out billboards and other unwanted visual stimuli and turn his world in a series of hyperlinks.

We know that technology is evolving day by day and AI is reaching new heights. Even the research is growing constantly and continues to grow. In the last five years, AI research has grown by 12.9% annually worldwide, hence it can be seen that the rate at which AI is growing is truly commendable.

It is predicted that in the coming four to five years, China will become the biggest global source of Artificial Intelligence and will take over the United States. The not so shocking thing is that Europe will be on the number one spot. It is the most diverse region with high levels of international collaboration. The third position will be held by India, which is humongous in terms of AI research output.

We all might be aware of the present situation, and what value does AI holds in our lives. AI collects and organizes large amounts of information to make insights and guesses that are beyond the human capabilities of manual processing. With its increasing organizational efficiencies, the likelihood of a mistake and detected irregular patterns is reduced. So, if we talk about spam or fraud, or the warning it provides to business in real-time about suspicious activity, a lot has been safeguarded already.

There is a multitude of ways that artificial intelligence is changing our day-to-day life. In some of the largest industries in the world, this ever-growing technology is rearing itself as a force to be reckoned with. Already we are seeing artificial intelligence creep into our education systems, our businesses, and our financial structures.

Artificial intelligence powered education programs are already helping students learn basic math and writing skills. These programs can only teach students the fundamentals of subjects, but at the rate this technology has changed, it’s safe to say it will be able to teach higher level thinking in the future. Artificial intelligence allows for an individualized learning experience. This type of technology can show what subjects a student is suffering in and allow teachers to help focus on building up specific skill sets.

With the expansion of technology knowledge and accessibility, we are seeing the road map of education change. In the future, a combination of artificial intelligence tutoring and support software will give an

opportunity for students anywhere around the globe to learn any subject at their own pace and on their own time.

Artificial intelligence has been able to automate simple actions like grading, which is relieving teachers and professors from time-consuming work. Teachers spend a lot of their time grading and reporting for their students, but it is now possible for educators to automate their grading for almost all types of multiple choice testing. Essay grading software has emerged in its early years as an improved tool to help teachers focus more on classroom management than assessment.

Artificial intelligence is able to process a significant amount of data in a short amount of time — more data than any human or computer program has ever been able to process. This allows banks to provide more targeted and individualized wealth management advice to their customers. For example, with risk assessment and artificial intelligence the time it takes to apply and be approved for a home or personal loan could be a matter of hours instead of months. This is due to AI's capability to work faster at unearthing and analyzing customer information.

Fiscal Tiger says that "artificial intelligence is capable of understanding each individual customer's financial situation is a real possibility for the future of personal banking." At this stage in the technology game, banks are already utilizing AI customer service with automated tellers, chatbots, and voice automation. Seven leading United States commercial banks have invested in AI applications that will serve as a part of their customer service to improve performance and increase overall revenue.

Bank of America reported that they would invest $3 billion in technology innovation in 2016. Artificial intelligence works to help financial service companies decrease their overhead risks, generate more money, and maximize their already available resources. Artificial intelligence is even changing the way that infamous Wall Street will one day operate. Eventually quantitative analysts will be replaced with a machine learned system that can build upon previous trading algorithms automatically updating and making their trading decisions more effective.

The Wall Street Journal has been quoted as saying that "artificial intelligence is expected to transform how companies in almost every industry do business." Technology is already changing the way that businesses process their products, create their products, and find their target market — allowing artificial intelligence to find its way into every application of business.

Artificial intelligence in manufacturing is having the largest impact on business and project management right now. For example, BP has begun using AI when drilling for oil. They use AI technology to prevent human errors by taking data from the drilling programs and advising the operators on how and when to adjust the drilling depth or distance. The hope is that in the future this type of technology can completely dissipate human error in intricate jobs like this.
Artificial Intelligence helps to get computing machines which perform intelligently and emotionally. Artificial Intelligence has got success in driving robots, filtering mails, medical diagnosing, predicting weather, playing game and so on.

If AI is the future, then there is absolutely no doubt. Starting from healthcare, education, e-commerce to water power, electricity and assembly lines, everything is automated. Such machines and technologies have helped humans to achieve efficiency and effectiveness.

There is a big shift in a way we live, work and relate to one another due to the adoption of cyber-physical systems, Internet of Things and the Internet of Systems."

With Self Aware Systems, human-like intelligence has been developed. With Artificial Superintelligence and AI algorithms, the machines are capable of outperforming the smartest of humans in every single domain.

Reinforcement learning**,** in simple words, is an algorithm or programming that uses a system of reward and punishment to train algorithms. A simple example of this can be. Suppose you want to teach your dog to sit. You will tell the dog to sit and at first, the dog will make a random action. If the action is not what we want then we give a negative reward so that the dog will do that action less. When we get the desired action, we will give a positive reward by giving a biscuit to the dog. This way the dog can be reinforced to learn things and then can make certain decisions.

Now that many companies are using robotic arms (like SCARA) in the routine operational aspects of manufacturing (assembly line operations, etc.), employees can put more focus on the critical aspects of their jobs. Adidas is planning to start Speed factory in Europe. *Speed factory is an entirely robot-enabled manufacturing plant.* It aims to reduce errors in manufacturing and shipping time. However, the increased usage of robots and AI in all fields might mean that companies will start letting go of employees. A recent study shows robots will take over more than 20 million jobs by 2030**,** thus creating mass unemployment.

The thought that someday, we will be sitting in the backseat of our car, and the car will drive itself to places (as per our instructions) is scary yet exciting. Automated transportation is exactly that. It has five levels, which basically represents the extent of autonomy achieved.

The above points paint a hazy picture as to what AI could really have in store in the future. But one can definitely say that AI is a violent delight. One thing is clear that it is going to be everywhere, and will be as helpful as electricity. However, the exploitation of AI could be quite destructive. Anyway, we can't predict the future.

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