The Road So Far

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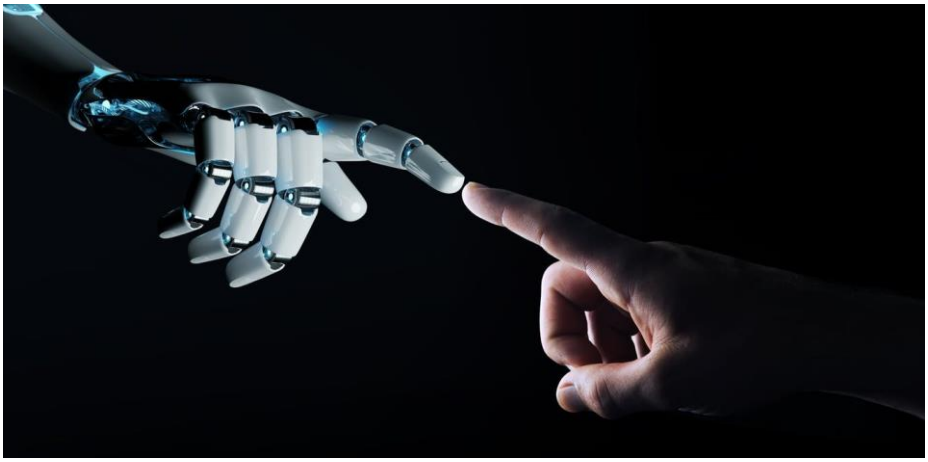

When we think of our world 100 years later, some may think about a post-apocalyptic world. A world where climate change may have forced countries to go for disagreements leading to rising tensions. On top of that because of shortage of resources every capable country will try to accumulate a greater share of the available natural resources to satisfy their growing demands. These activities may eventually lead to destroy the diplomatic relationships between the countries which may at extreme cases lead to wars. At this point you may think of some apocalyptic movies of Hollywood that has portrayed many times such a dramatic situation. But some may think the road ahead in a completely different way where technology will change the world in a way we never could have imagined. The time when robots becomes smarter than

This article is written by Aniket Das.

humans. With help of smarter technology, we are able to utilize our remaining resources judiciously. Let's talk about the latter case then.

Today in the field of technology artificial intelligence (AI) has become the talk of the town. In the last two year everyone who reads articles must come across this term many times. It all started with perceptron which is a digital neural network built to mimic human neuron. Developed by a psychologist Frank Rosenblatt in 1957, it was hypothesized that over time it can automatically recognize pictures shown. Perceptron was shown hundreds of images of men and women with the hope that eventually the network will learn the differences between men and women. This idea caught media attention and it got much hype because of major media publishers. But all was not good for Rosenblatt. Computers at that time were not very powerful and processing speeds were not that great which made the single layer of neural network present in perceptron very limited in function. The idea was hence not given much importance at that time.

Two decades later something revolutionary happened. The birth of VLSI has helped improving the processing power of computers. Geoffery Hinton, a psychologist shifting to computer science, looked at the decade old idea and theorised that human brain is indeed a neural network. Hinton was confident that if some tweaks were made in the existing AI technology then it would mimic just like neuron in human brain. There are two options to make a machine intelligent. Either you can program it or it can learn from making mistakes. Hinton identified to handle complex tasks in real world Rosenblatt's single layered neural network approach was too simple. He initiated the idea of a multi-layered neural network approach for allowing greater capabilities. Today this multi-layered approach is called deep neural network.

After so much technical talk lets generalize it. Hinton's deep neural network resulted in a program that can make accurate guesses and predictions about data as never seen before. This idea is widely appreciated and taken into consideration. Hinton's multi-layered approach was put into applications like self-driving cars in early nineties. It was also put in a program to recognize hand written digits. So now the AI has come a long way from its embryonal stage. But now it faced two major problems. First, lack of enough data to recognize patterns and second, though the processing power of computers improved over time but it's still a long way to match with expectations required for a neural network.

As time passed the speed of internet improved. Today almost 2.5 quintillion bytes of data are created each day. So, the first problem is solved. Also, the computing power has reached to a

next level. As a thumb rule states that processing power doubles in every two years. So, the second problem is also solved. Today's AI technology can be traced back to Alec's net, a program developed by Hinton. It had performance like no one has ever seen. This send an earthquake in the science community and a wave of neural network innovations began.

Today we see AI everywhere. It has become a mainstream. Tesla has used the technology to create a sophisticated self-driving AI. Self-driving cars are predicted to reduce accidents by up to ninety percent and also reduce travel time by twenty six percent. Netflix, YouTube, Prime videos and host of other video streaming uses AI to analyse what shows you watch. It tries to understand your preferences and suggests you videos according to your likings. It even knows finer details like at which parts of episodes most users are leaving the app. Which areas of a film most users like. They would use them to make their next films much better. Uber uses machine learning AI to determine surge pricing, your ride estimated time of arrival and optimize the services to avoid detours. The smart speakers and assistants are also AI driven to some extent.

Now what happens at a time when machines surpass human capabilities. In technology world this is termed as singularity. What happens next is a bit of an open-ended question.

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