

A GLANCE INTO THE FUTURE

Will AI Take Over?

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Do you sometimes wonder if films like 'Matrix' will become reality? Well today we will introduce you to the world of AI and Machine learning.

AI stands for Artificial Intelligence and is the concept of a branch of computer science that deals with the simulation of intelligent behaviour in computers. It also has the capability of a machine to imitate intelligent human behaviour (so giving the computer the ability to learn). According to Technopedia, some of the activities computers with artificial Intelligence are designed to include are:

- ❖ Speech Recognition
- ❖ Learning
- ❖ Planning and Organisation
- ❖ Problem solving

AI is demonstrated by machines in contrast to Natural Intelligence (NI). Some people consider AI a danger to humanity while others consider it an assistant. AI revolves around the use of algorithms. An algorithm is a set of instructions that a mechanical computer can execute. A complex algorithm is often built on top of other simple algorithms. For example in chess: If someone has a "threat" (that is two in a row) take the remaining square. Otherwise,

- ❖ If a move "forks" to create two at once, play that move. Otherwise,
- ❖ Take the centre square if it's free. Otherwise,
- ❖ If your opponent has played in a corner, take the opposite corner. Otherwise,
- ❖ Take an empty corner if one exists. Otherwise,
- ❖ Take any empty square

Another term which is centred around AI is 'Machine Learning'. This is different from artificial intelligence as it is the application of AI which is based around the idea you can just give machines data and lets them learn for themselves.



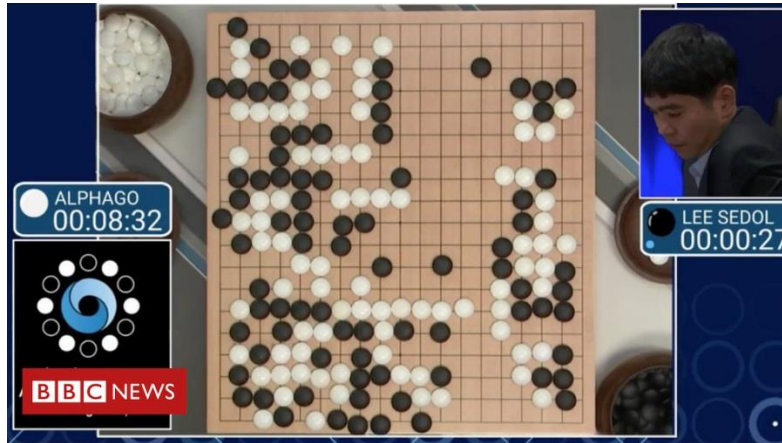
One example of AI in action is the system AlphaGo which is the first computer program to defeat a professional Go player and is now known as the strongest Go player in history.

Go is an extremely difficult game from China. It was invented 3000 years ago and the aim of the game is to move your pieces so that you capture as much of the board as possible. For more about Go click on the link below:

[Go \(game\) - Wikipedia](#)

The programs first formal match took place in October 2015 against former European Champion Fan Hui. Surprisingly, AlphaGo won 5-0. This victory was closely followed by 5 matches against the legendary Lee Sedol - who has won 18 world titles. AlphaGo shocked the world with his 4-1 win in March 2016 earning himself the highest Go level.

The match was watched by over 200 million people worldwide. The game was so popular because AlphaGo exhibited a lot of extremely controversial moves which overturned years of wisdom on the game. AlphaGo schooled the world!



BBC.Com

Go has been avoided by programmers due to its extreme complexity. Despite decades of work prior to AlphaGo all other programs were only as good as a human amateur.

Normal AI programs use a search tree however, this has no chance on Go as there are as many possible positions as there are atoms in the universe. So AlphaGo uses a combination of an Advanced Tree Search and deep neural networks. These networks are:

- Policy Network-Selects next move

- Value network-Predicts the winner

The program is also developed when the team shows the program a series of extremely professional games to develop the programs understanding. Finally, AlphaGo plays against different versions of its program so that it can learn from its mistakes. This is called reinforcement learning.

Here is an interview with Scarlet Schwiderski-Grosche who is Principal Research Program Manager in the Microsoft Research Outreach EMEA group.

1. There were attempts to succeed at AI in the past why should it be successful now?

Because now we have big data centres (the cloud) and larger amounts of data can be collected through social networks or sensors. Large data volumes and processing facilities are a prerequisite for AI.

2. What are the dangers of AI?

People believe if Artificial Intelligence becomes reality then robots can take over the world as in 'Terminator' and 'Matrix' films. However, this is not really possible as humans are always

in control of the programs. Also depending on what data you use to train your system, it might be biased.

3. How does AI work?

Most people understand Machine Learning to be AI, but for this you need lots of test data to train your AI system the more data you use the better the system learns.

4. When will AI brains become reality?

The lab director of a big research lab (Chris Bishop) believes we are a far way off. We might be 2% there but we still need at least 50 years to achieve the knowledge and capacity of a human brain.

Stephen Hawking (Who passed away on the 14th March) told the BBC: "The development of full artificial intelligence could spell the end of the human race."



Quartz

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