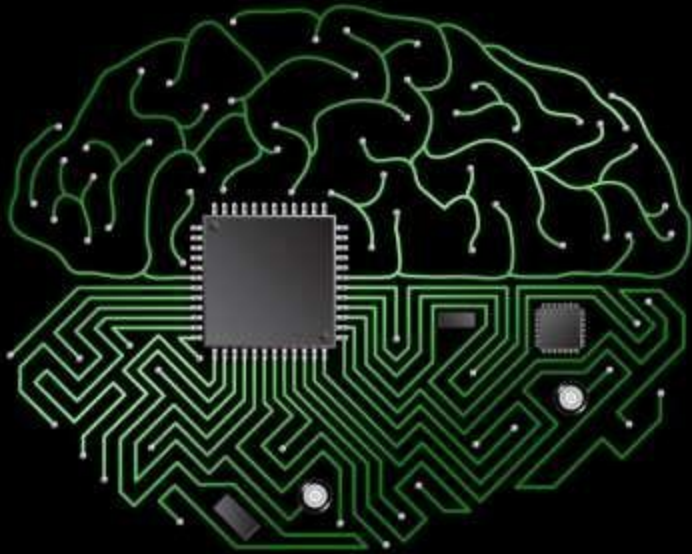# Artificial Intelligence

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What is Artificial Intelligence

"The ability of a digital computer or computer controlled robot to perform tasks commonly associated with intelligent

History of Artificial Intelligence

The idea of AI goes as far back as ancient Greece. Greek myths speak of Hephaestus, a blacksmith who created mechanical servants. This is one of many examples.

History of Artificial Intelligence

Fast forward to 1935, when the earliest substantial work in this field was done by Alan Turing, a logician and computer pioneer.
- Turing Machine

1951: Christopher Strachey wrote the first successful AI program
- Computer checkers program

1956: John McCarthy coined the term Artificial Intelligence

1963: ANALOGY, a program created by Thomas Evans, proved that computers can solve IQ test analogy problems

History of Artificial Intelligence

1967: First successful knowledge-based program in science and mathematics

1972: SHRDLU created by Terry Winograd
• Robot arm responded to commands

1987: Marvin Minsky publishes *The Society of Mind*, which portrays the brain as a series of cooperating agents

1997: A chess program, Deep Blue, beats the current world chess champion, Gary Kasparov

2000's: Interactive robot smart toys are

Goals of Artificial Intelligence

- Deduction
- Reasoning
- Problem solving

Where We Are Today?

- Driver-less Transportation

- Automated Assembly Lines and Dangerous Jobs

- Surgery Aid Robots

- Next-Generation Traffic Control

Driverless Transport

- Google has been investing in a driverless car, and has completed over 480,000 autonomous-driving miles accident-free.

- Through the use of cameras, sensors and special software built into vehicles manufacturers have been able to build cars that park themselves at the touch of a button.

- Driverless trains carry passengers from city to city in Japan without the need for human help.

- Google's driverless car relies on lasers and sensors to spot obstacles, interpret signs and interact with traffic and pedestrians.

- Artificial intelligence takes away the responsibility from the drivers, and also eliminates the danger of distracted driving and boasts a reaction time much faster than that of any human.

Surgical Aid Robots

- Cedars-Sinai Medical Center relies on special software to examine the heart and stop heart attacks before they occur

- Artificial muscles feature smart technology that allows them to function more like real muscles.

- Penelope, a Robotic Surgery Assistant developed at Columbia University can not only pass the correct tools to doctors, but also keep track of these tools and learn about a doctor's preferences through artificial intelligence.

- The most advanced surgical robots are programmed to perform the entire surgery on their own, except for the suturing or the cutting. In these operations, a surgeon stands by just in case something goes wrong.

- Miniature intelligent robots are being developed for eye surgeries.

Automated Assembly Lines and Dangerous Jobs

- Some countries have put smart robots to work disabling land mines and handling radioactive materials in order to limit the risk to human workers.

- Ford is using an Artificial Intelligence based approach for vehicle assembly process planning, ergonomics analysis, and a system that uses machine translation to translate assembly-build instructions for assembly plants that don't use English.

- Other Companies such as GM have developed robots with Artificial Intelligence techniques to inspect cars made by humans

Next Generation Traffic Control

- Artificial Intelligence in traffic lights seeks to improve the efficiency of traffic flow, hence improving road space utilization, reducing journey times and potentially, improving fuel efficiency, as well as reducing the impact of cars on the road.

- In the future, they want to create a traffic control system that thinks like a human in directing traffic.

- "We can consider a future where all vehicles are equipped with WiFi and GPS and can transmit their positions to signalized junctions. This opens the way to the use of artificial intelligence approaches to traffic control such as machine learning."

The Future of A.I.

Future of A.I.

Right now, A.I. is at level comparable to less intelligent animals or insects.

Is it possible to go farther, to reach human intelligence?

"Cognitivists", who believe the human conscious can be simulated, and "anti- cognitivists" who believe it to be impossible.

Future of A.I.

2050: Estimated date of the emergence of the Singularity, or greater-than-human super-intelligence.

At this point, it's thought that certain machines will exceed the human brain in terms of intelligence

It's believed that this breakthrough will lead to a rapid advancement in technology, as super intelligent A.I. designs new computers and machines at a rate no human could

Strong A.I.

Strong A.I. is intelligence that matches or exceeds that of human intelligence
Ultimate goal of A.I. research

Weak A.I. is narrow/more

focused

than strong A.I.

Whole Brain emulation- Mapping and re-creating the human brain through neuro-imaging

Problems with A.I.

One basic problem lies in the question of what intelligence is exactly.

How can we recreate a learning, thinking mind with technology? Is it even possible? Some do not think so.

David Gelernter, a Yale professor, says A.I. is "lost in the woods".

Problems with A.I.

What is the human conscious? Gelernter argues that we can't construct a conscious A.I. without even knowing what exactly the conscious is.
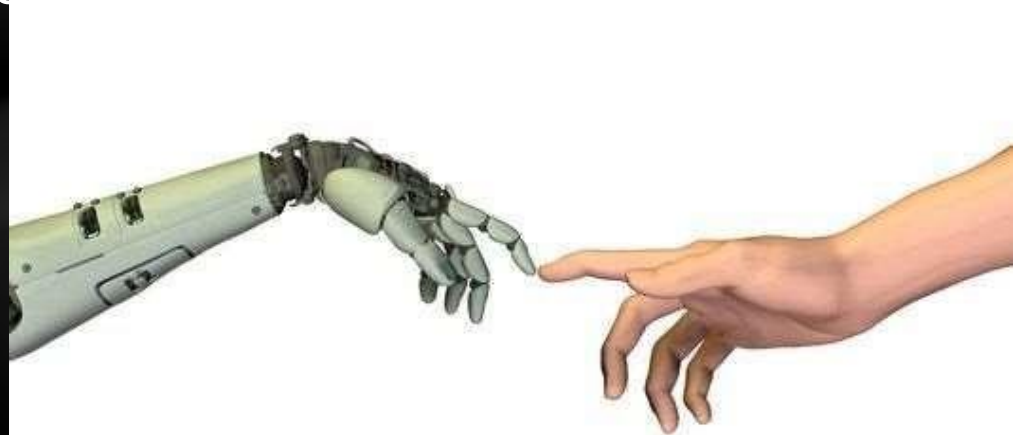
"Without this cognitive continuum, AI has no comprehensive view of thought: it tends to ignore some thought modes (such as free association and dreaming), is uncertain how to integrate emotion and thought, and has made strikingly little progress in understanding analogies--which seem to underlie creativity."

Problems with A.I.

Scientists need to figure out the "algorithms of thought", basically a way to mathematically simulate the human thought process.

The human brain relies on chemistry and physics of different molecules in order to function. How could scientists ever replicate this process?

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THANK YOU