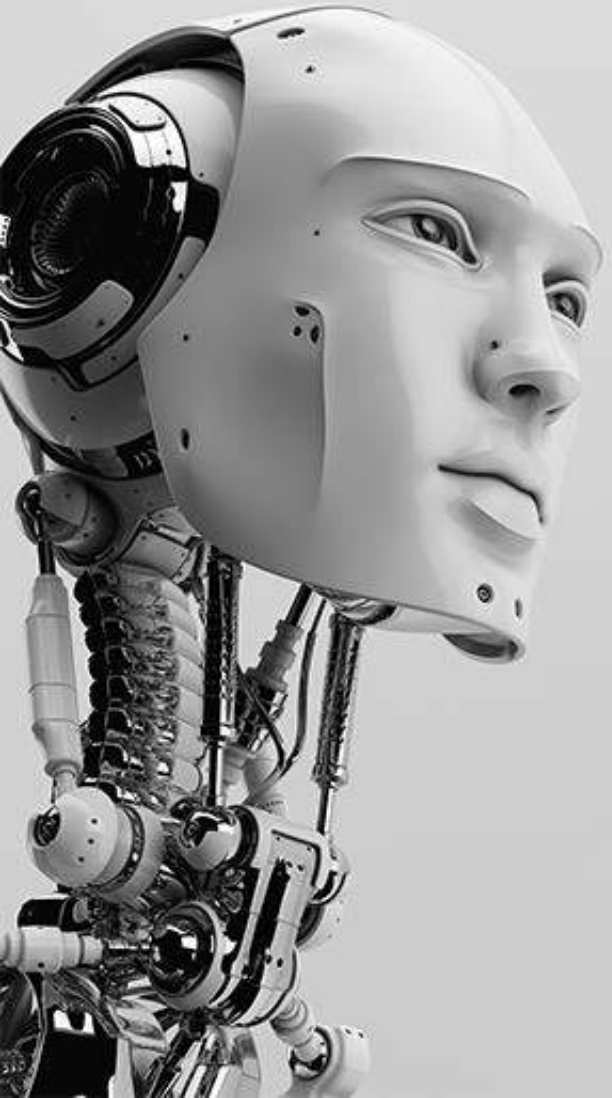
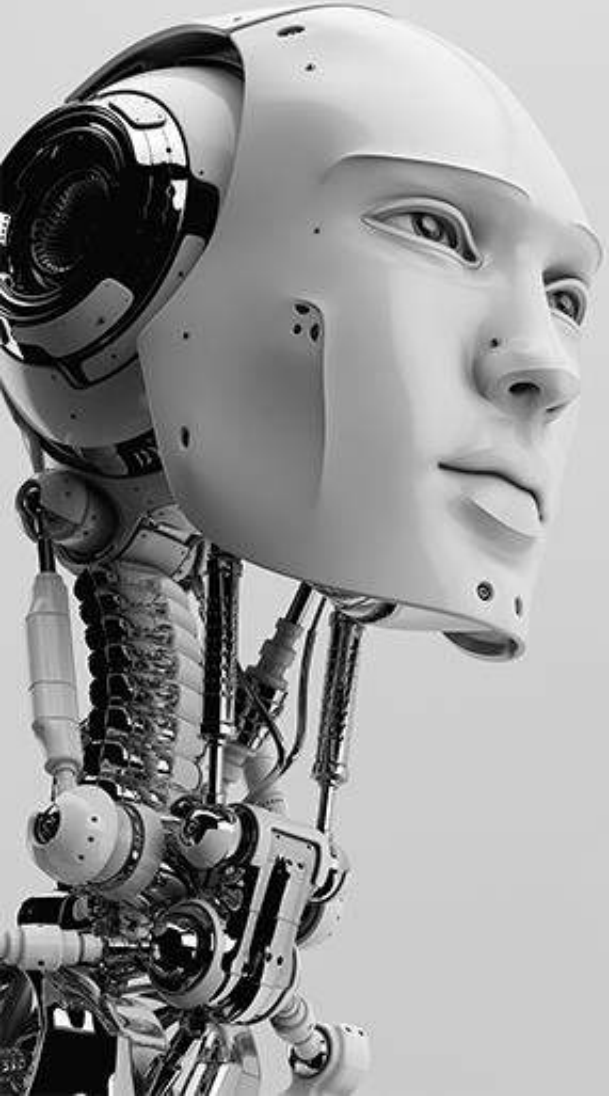


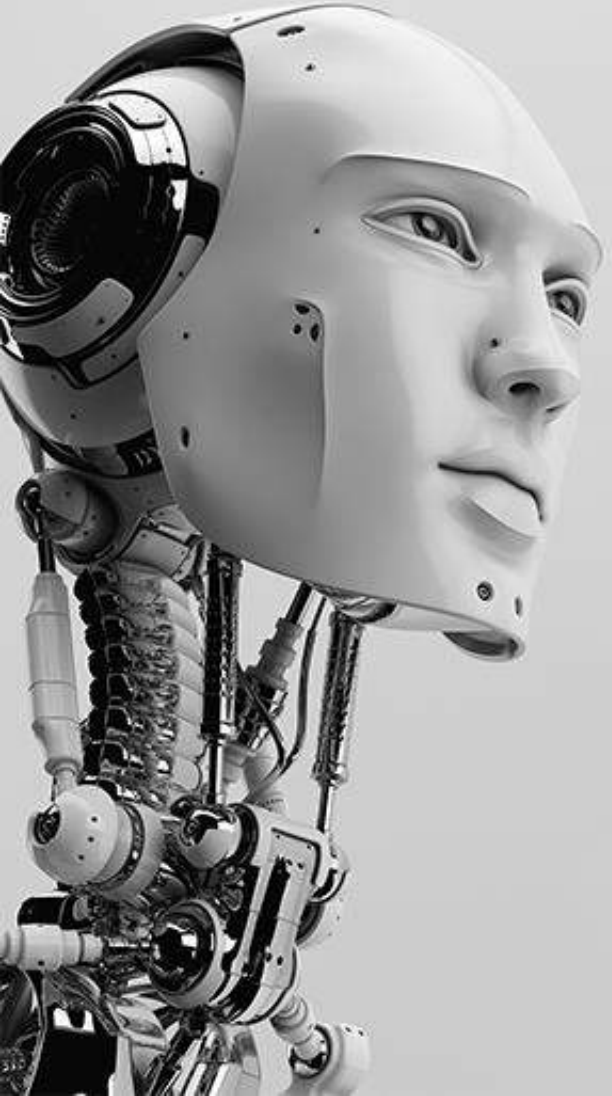
Artificial Intelligence

By NITIN UMESH

What is Artificial Intelligence?



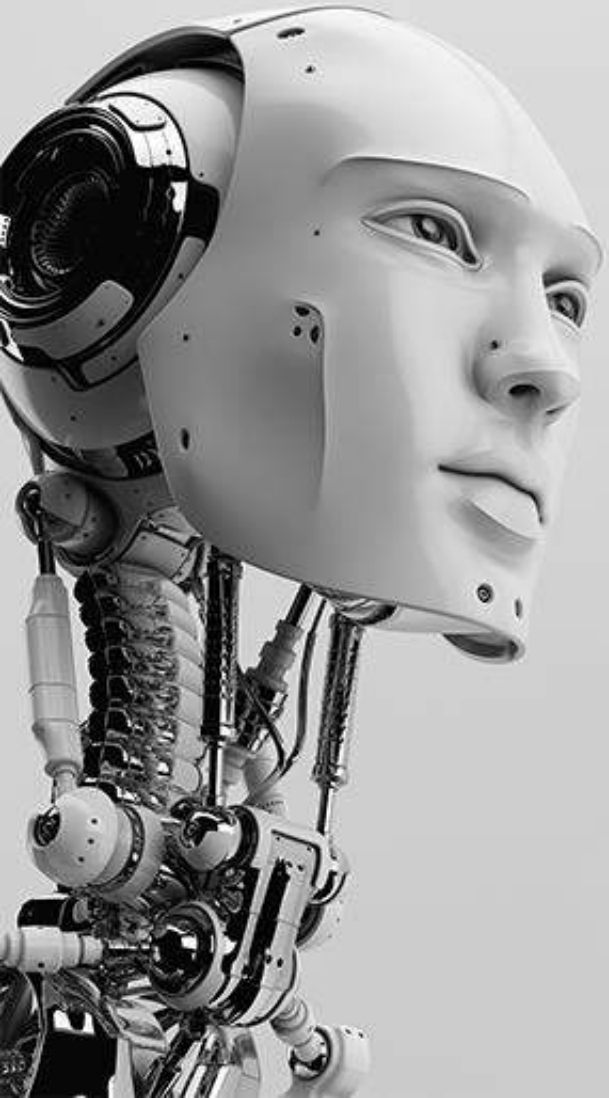
Artificial Intelligence



- Basically, “Putting human intelligence into machines.

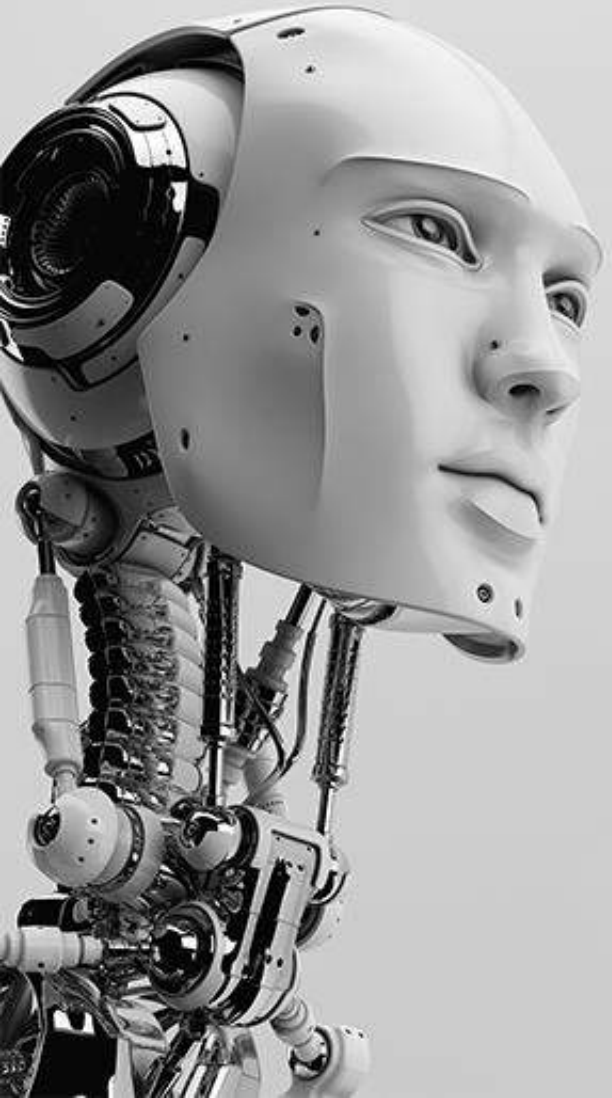
> “The study of intelligent behavior and the attempt to find ways in which such behavior could be engineered in any type of ARTIFACT”.

- “Artificial Intelligence is the study of how to make computers do things at which, at the moment, people are better”-Rich and Knight.
- “AI is basically a theory of how the human mind works”-Mark Fox.
- “Artificial Intelligence is behavior by a machine that, if performed by a human, would be called intelligent”(well publicized).



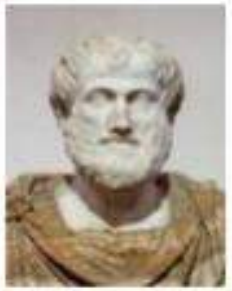
John McCarthy

- **"The science and engineering of making intelligent machines".**
- He was the first to introduce the term Artificial Intelligence.
- "Dartmouth conference"-On August 31,1955 he called a conference that got all the main people in the field of AI together to lay the foundation for the AI industry.
- Professor of Computer Science at Stanford university
- M. L. Minsky, N. Rochester, and C.E. Shannon.

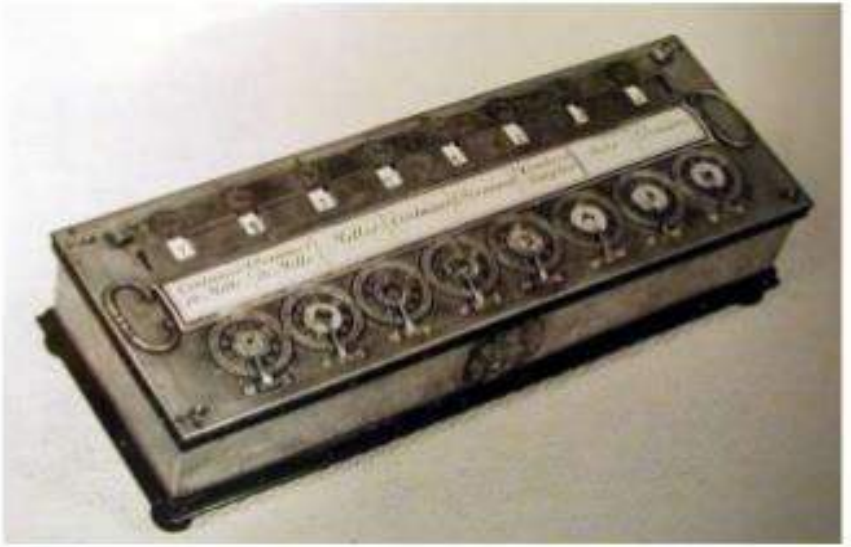


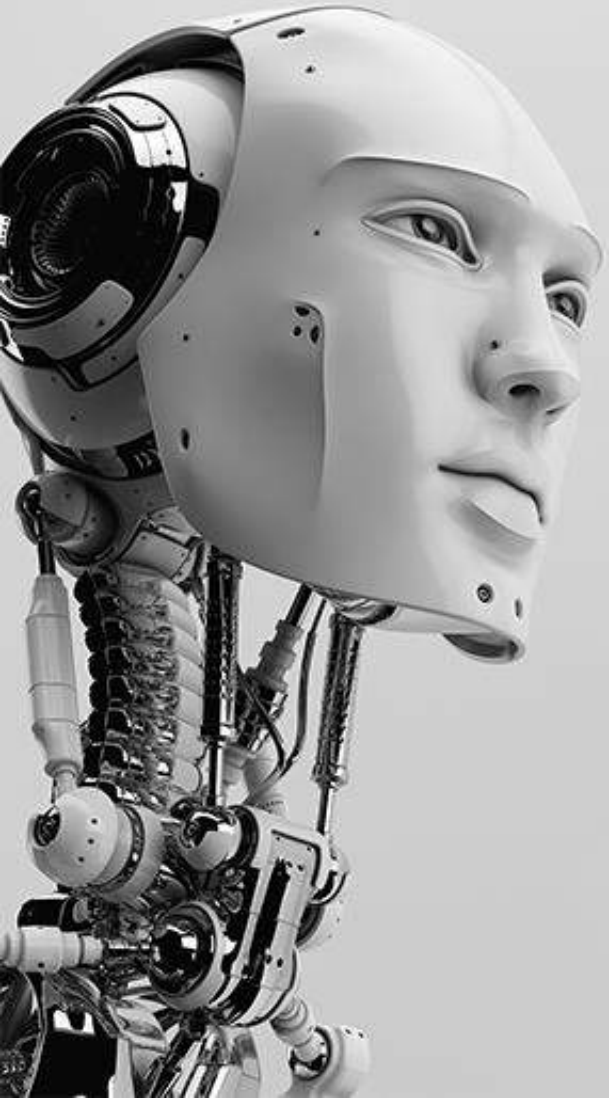
History of A.I.

- **5th century B.C.-** Aristotle invented syllogistic logic, the first formal deductive reasoning system.



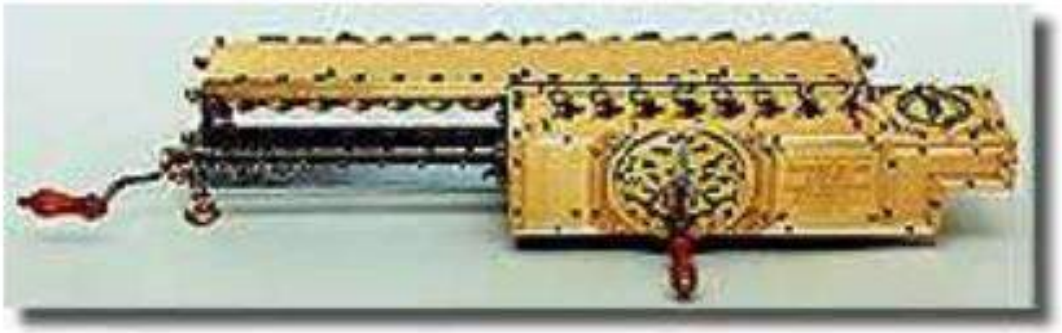
- **17th century**
  - Pascal created the first mechanical digital calculating Machine (1642).



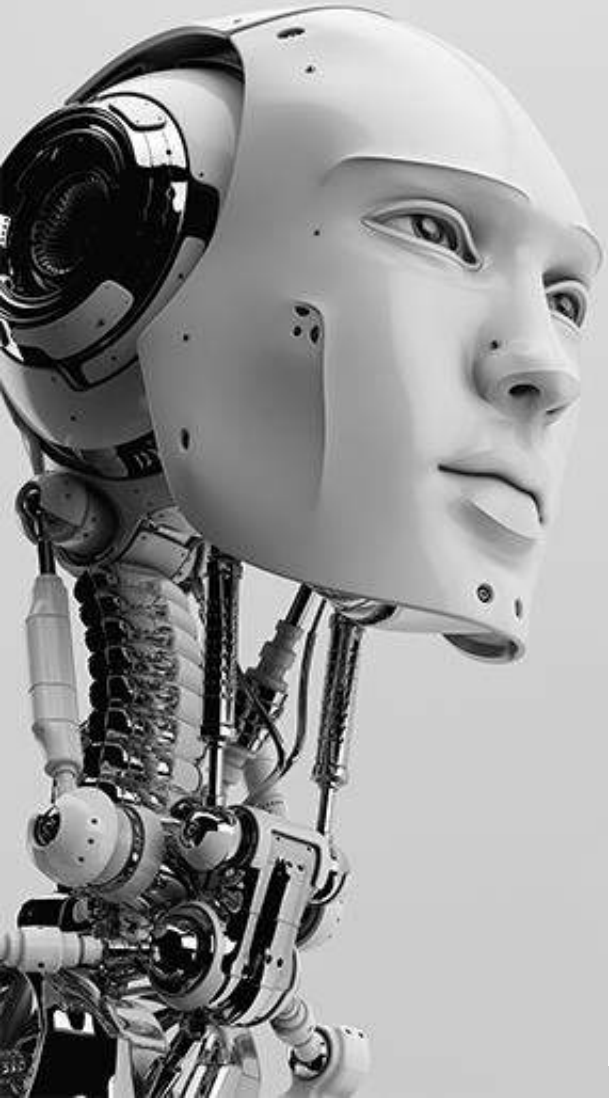


History of A.I.

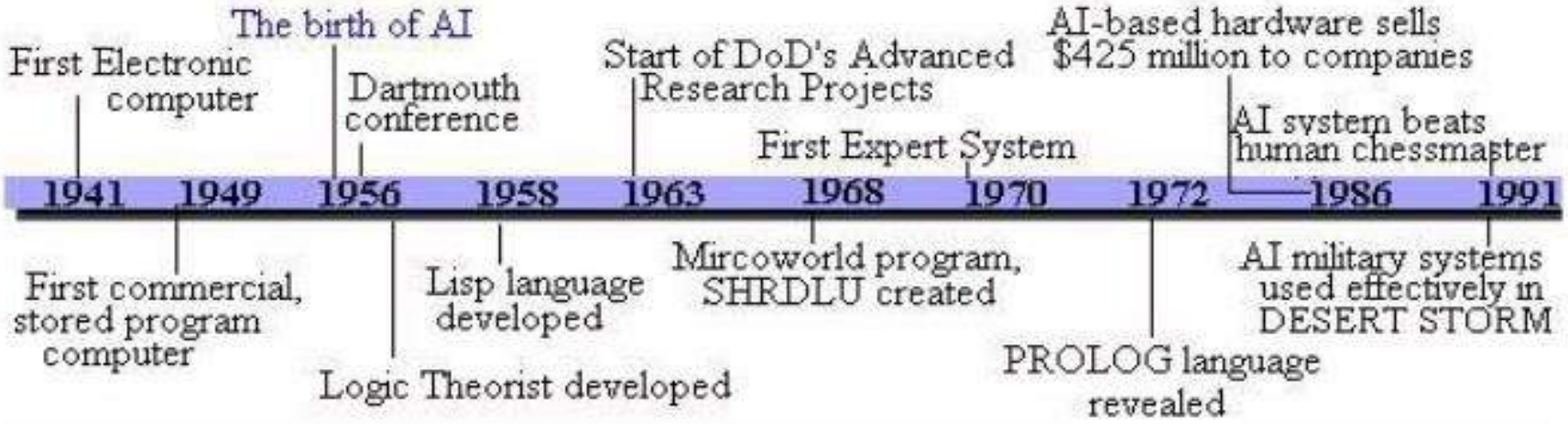
-Leibniz improved Pascal's machine to do multiplication & division with a machine called the Step Reckoner (1673) and envisioned a universal calculus of reasoning by which arguments could be decided mechanically.

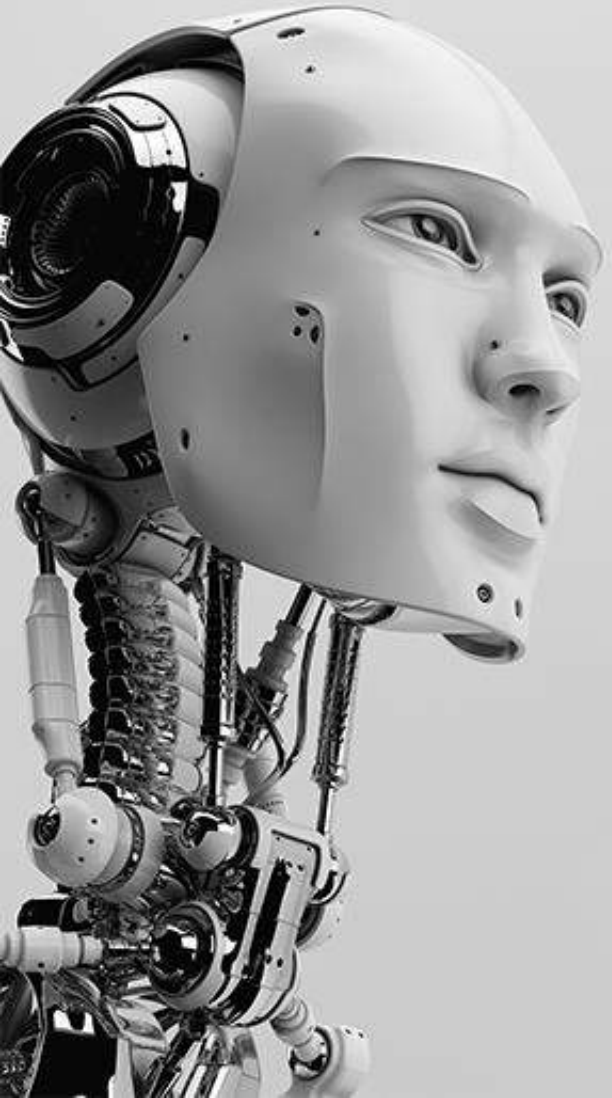


- **18th century**
- a fake chess-playing machine constructed in 1770 by Wolfgang von Kempelen.



History of A.I.



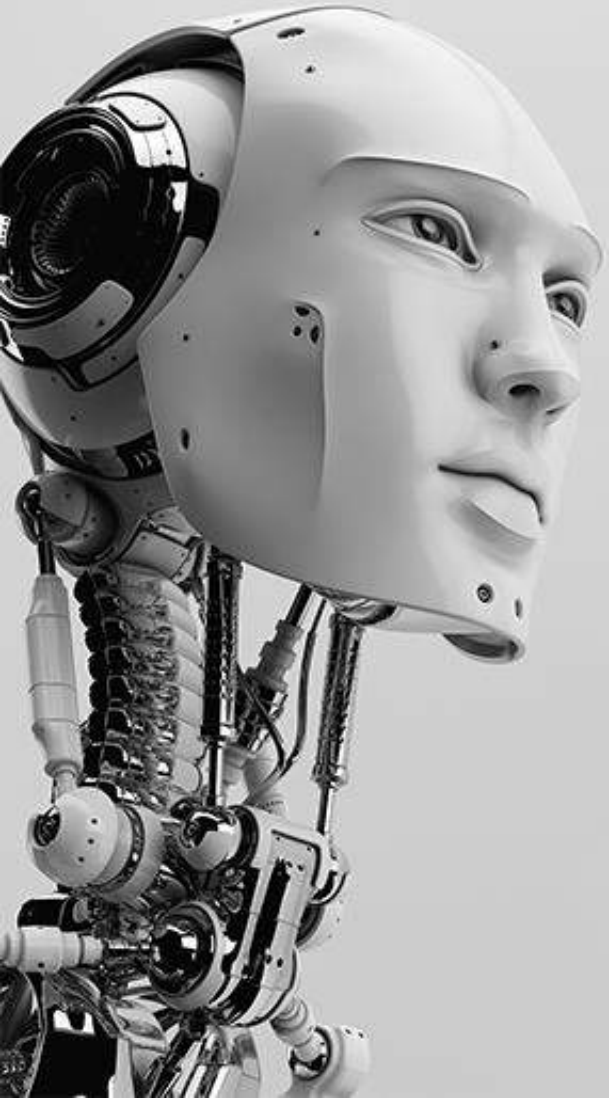


Types of A.I.

- A.I.'s definition leads to division in what A.I. refers to two general types:-

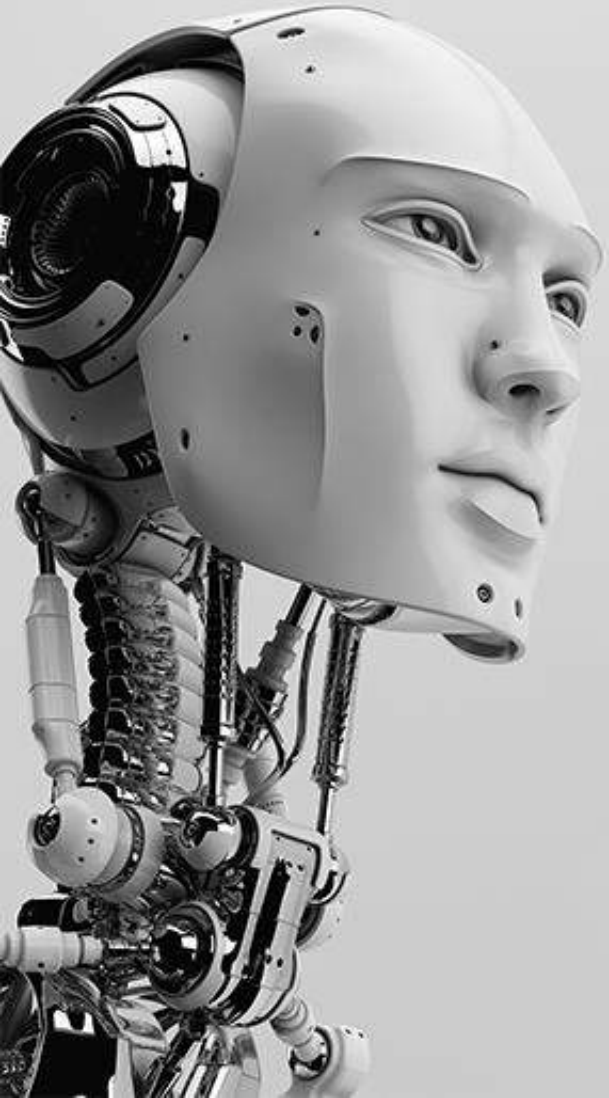
Weak A.I.

Strong A.I.



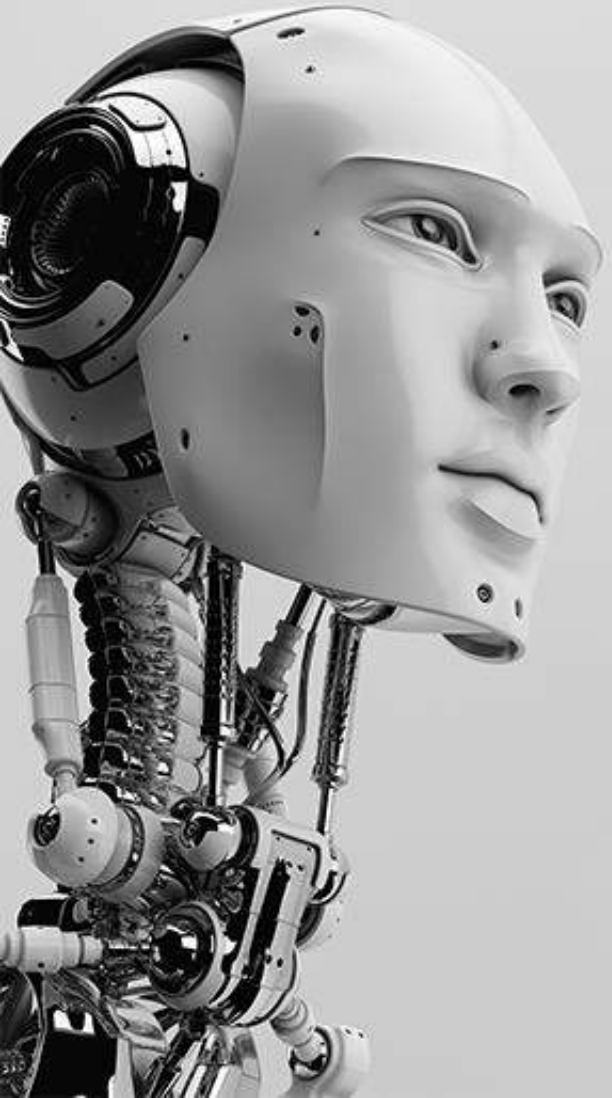
Weak A.I.

- Weak A.I. refers to A.I. that only simulates human thoughts and actions.
- Actions, decision and ideas are programmed into it.
- They mimic humans based on their programming
- All current forms of A.I. are 'Weak A.I.'



Strong A.I.

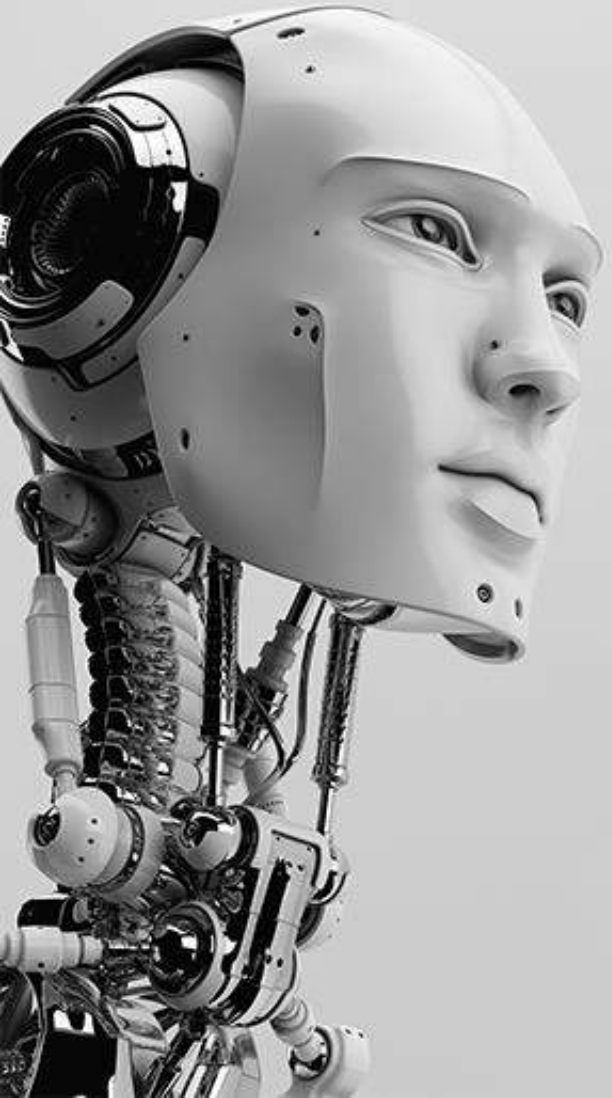
- Strong A.I. refers to A.I. that matches or exceeds human intelligence.
- Example: The robots from the movies 'Matrix, Terminator, iRobot, Artificial Intelligence'.
- Also called "True A.I.", as they are truly intelligent.
- They don't just simulate humans, they are intelligent on their own.
- Able to learn freely and adapt, self aware, free will.



SOFTWARE OF AI

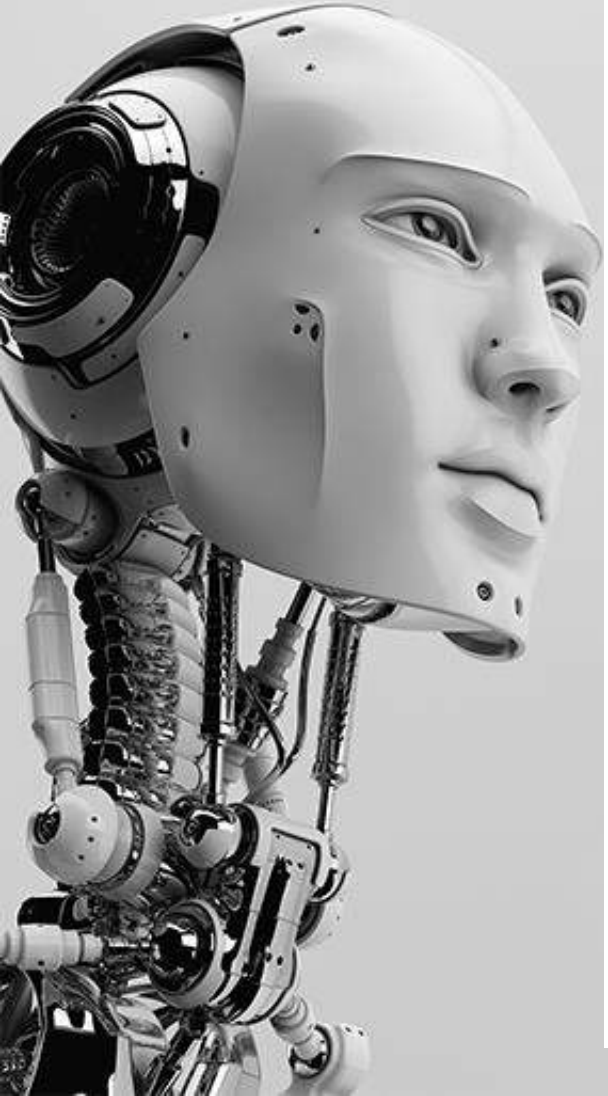
Prolog

Lisp



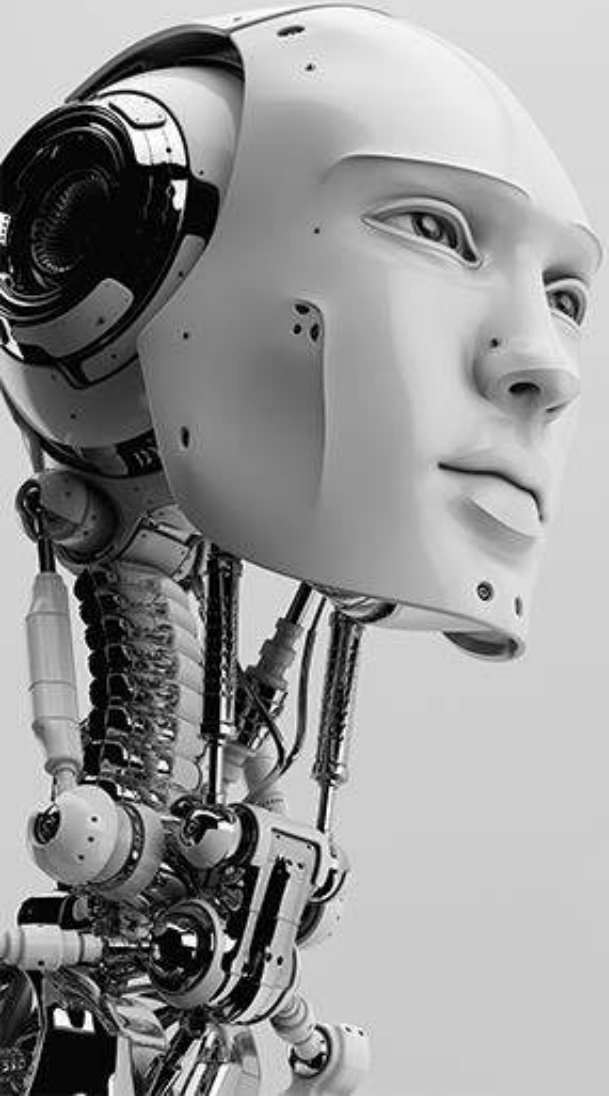
PROLOG (PROgramming in LOGic)

- Where other programming languages tell the computer how to do something, PROLOG tells the computer what to do.
- PROLOG does this by reasoning out the variables and parameters stored in the computers memory.
- The key to PROLOG programming is writing clear, precise parameters.
- With these precise variables and parameters PROLOG is able to use its built-in reasoning mechanism called “backtracking” to solve any user-entered queries.

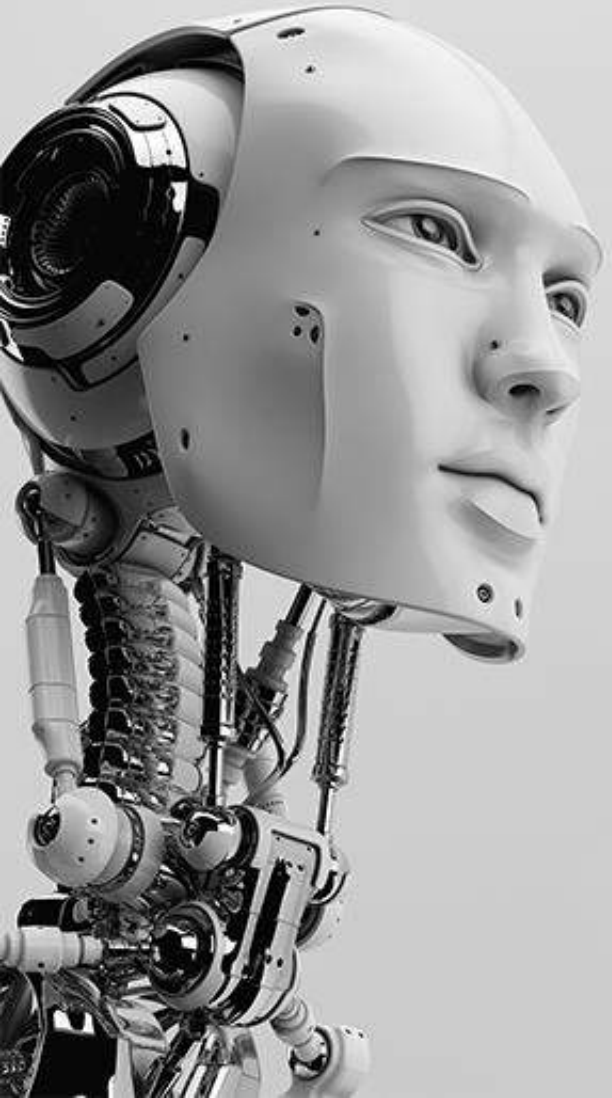


LISP (LISt Processor)

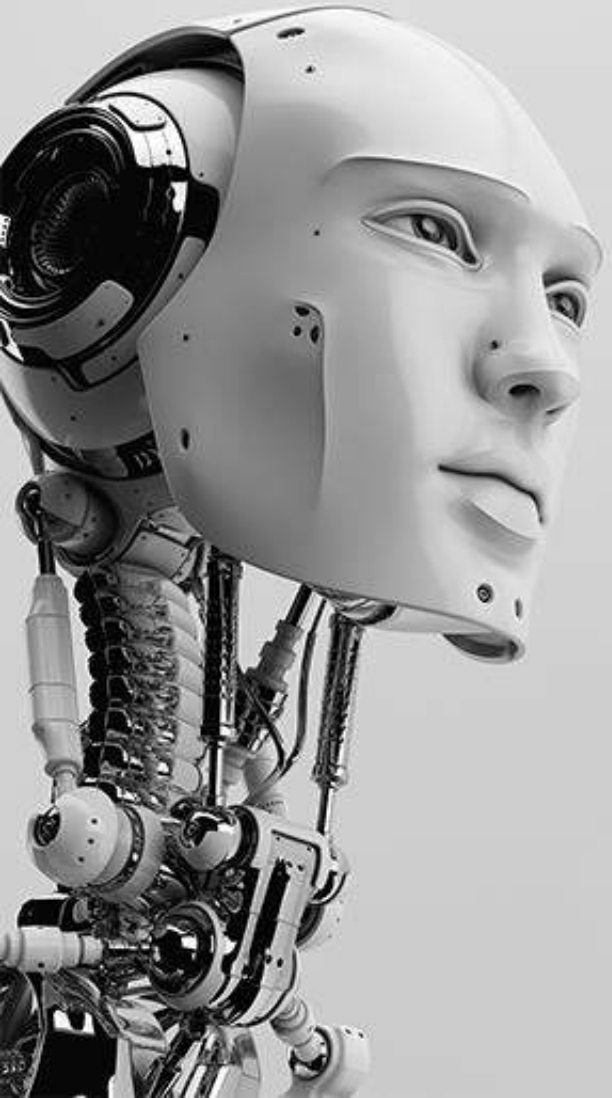
- List- Important information arranged in an ordered sequence.
- The flexibility of LISP allow the programmer to use a wide range of things from system programs to system processes without having to state them in advance.
- This flexibility is allowed because LISP doesn’t use a backtracking mechanism, however one can easily be equipped to the processor.
- In today's world LISP has several features that make development easier, which has it viewed as a programming standard.



APPLICATIONS



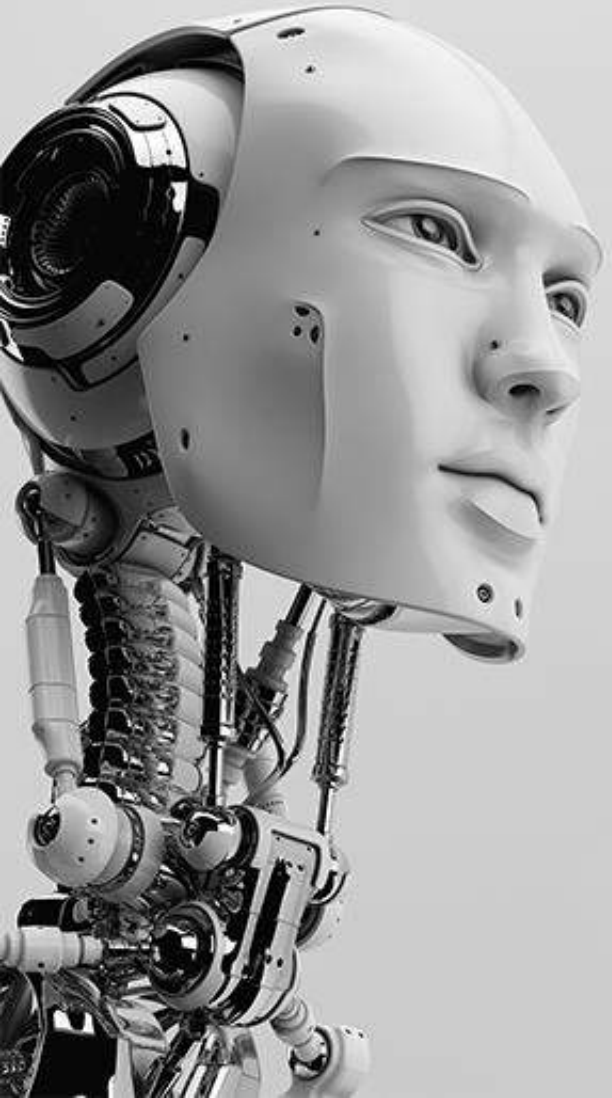

GAME
PLAYING



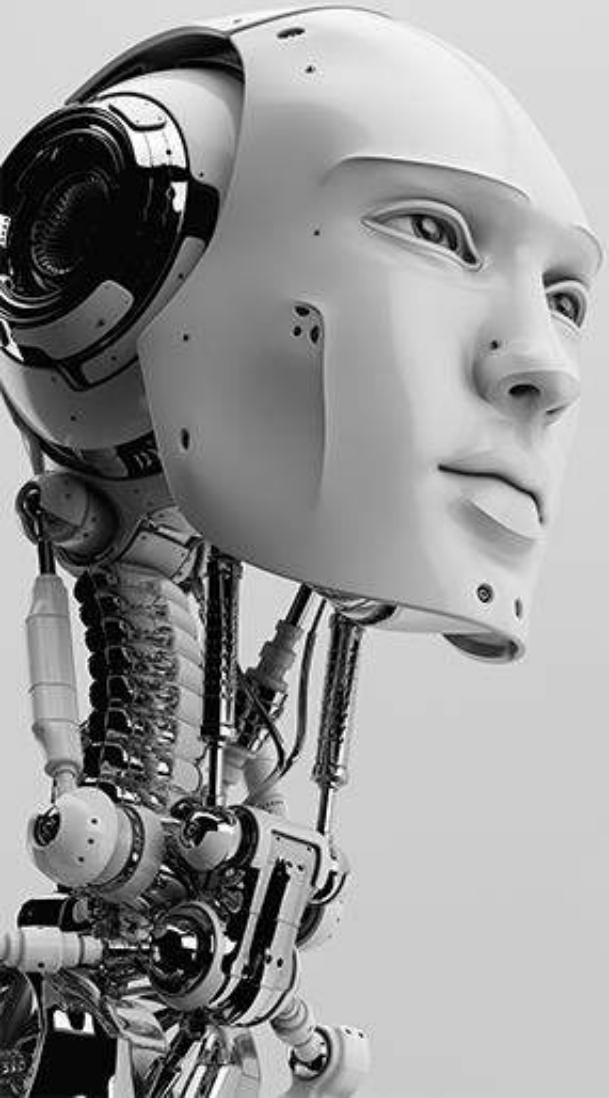
"Game Playing"

- What you do in the game will determine how the computer reacts
- Ex. An enemy see's your character, the computer's reaction is to attack your character

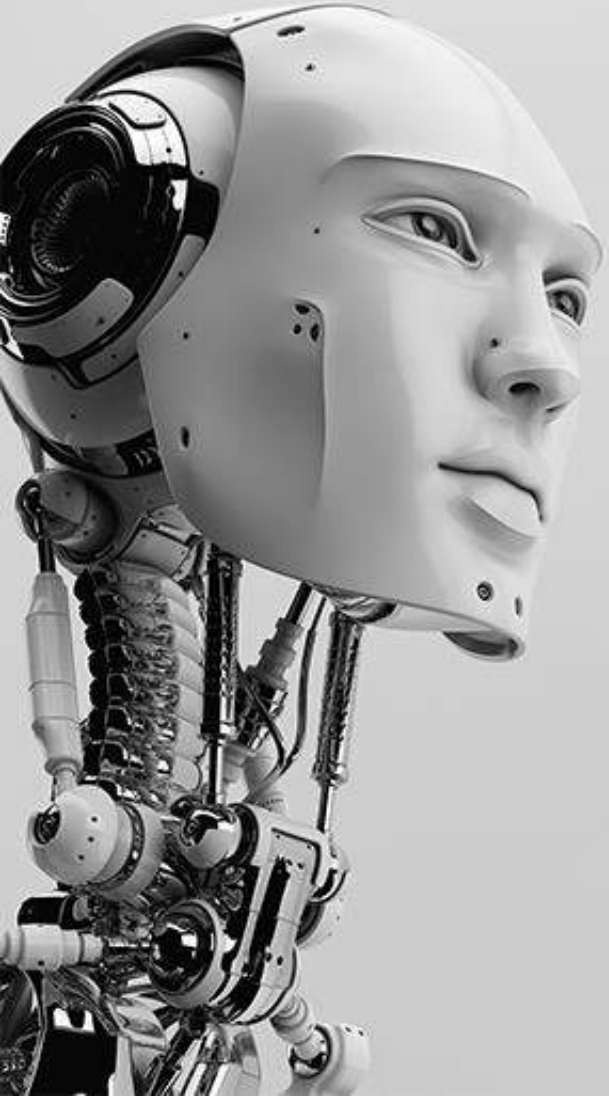
- Computer Chess
- Herzog Zwei and Dune 2
- Far Cry
- Half- life
- F.E.A.R.



“Gaming Today”

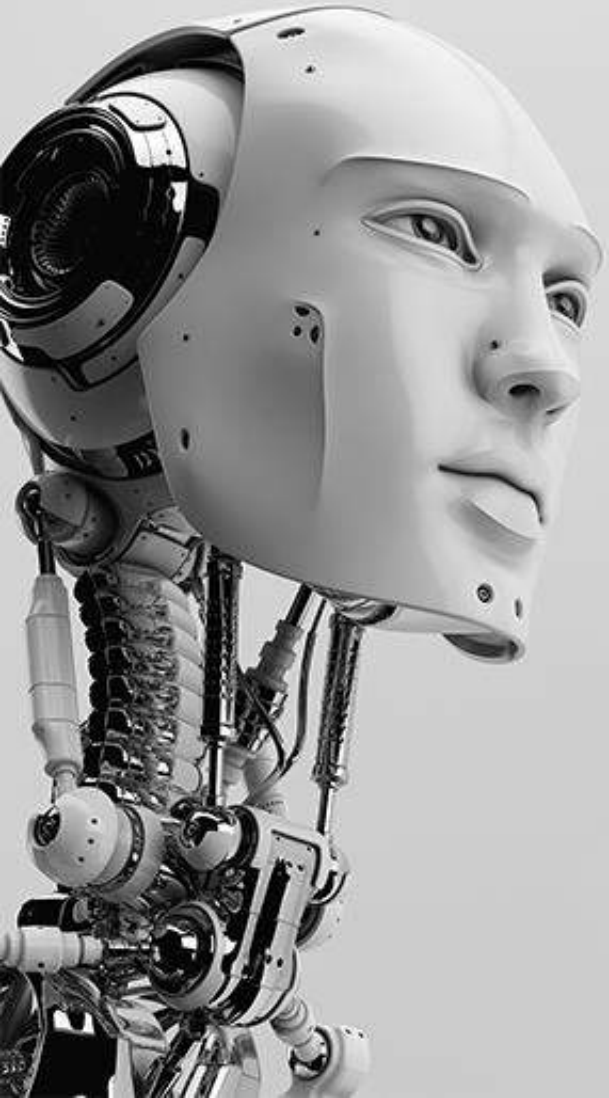


Speech Recognition



Speech Recognition

- Speech Recognition is a technology that allows the computer to identify and understand words spoken by a person using a microphone or telephone.
- Converts audio signals into text, or takes spoken input and changes it to written output.
- It maps the audio signals to form an abstract meaning of the spoken input.
- Even these systems are quite limited – you must speak slowly and distinctly.'
- The ultimate goal of the technology is to be able to produce a system that can recognize with 100% accuracy all words that are spoken by any person.



Speech Recognition Process

Spoken Input

↓

Converted into a digital format

↓

Digital input is then broken down in (x) number of phonemes

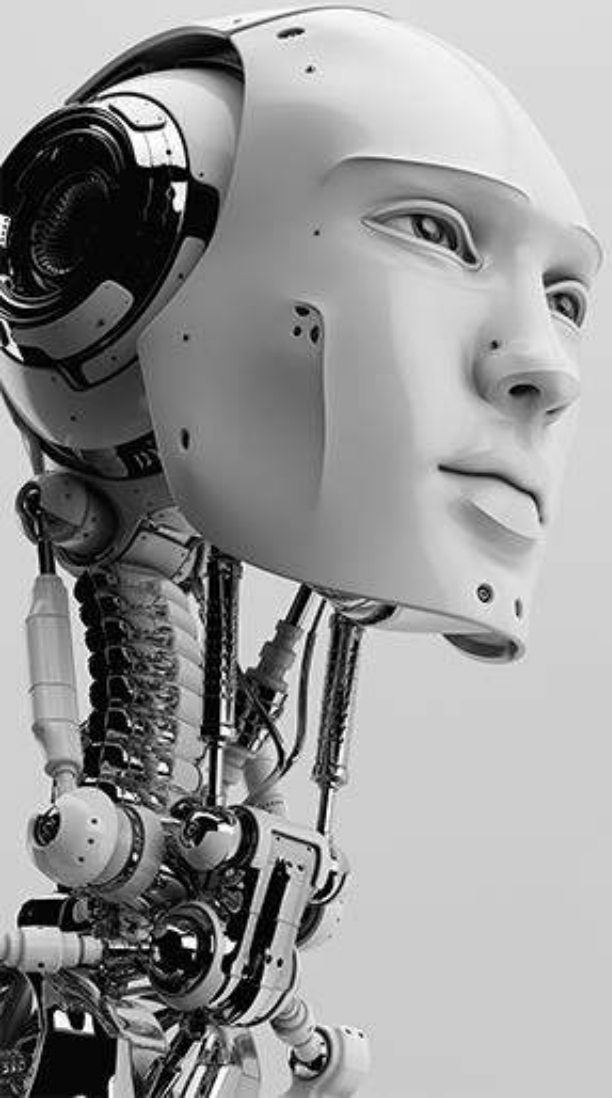
↓

Program then compares the phonemes to words in its database

↓

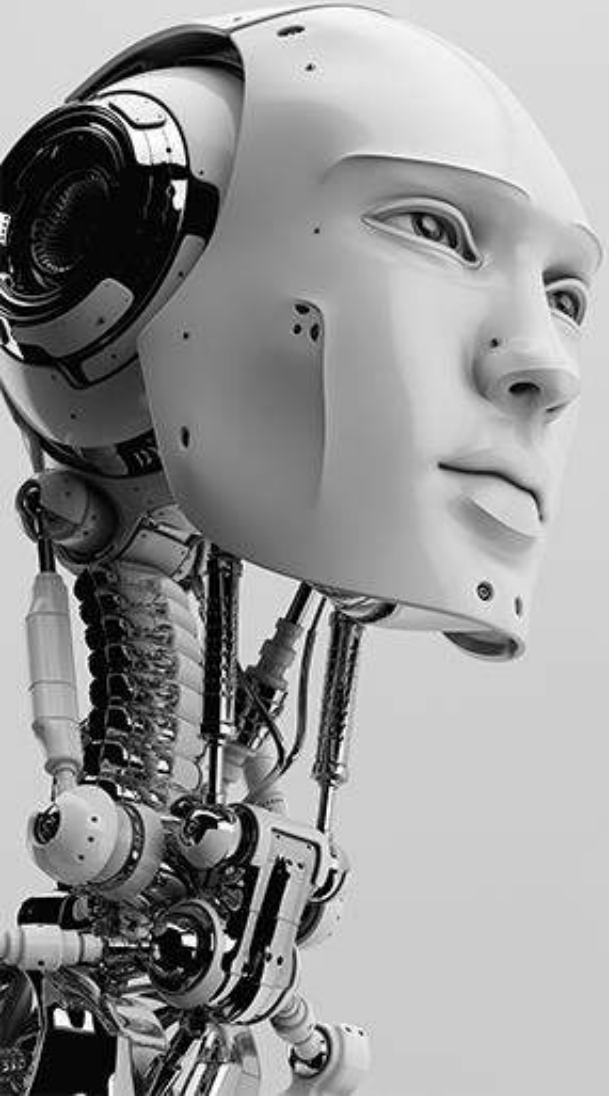
Program then decides what it thinks the word is and displays the best choice

*Phoneme-symbol or unit that represents sounds of speech.

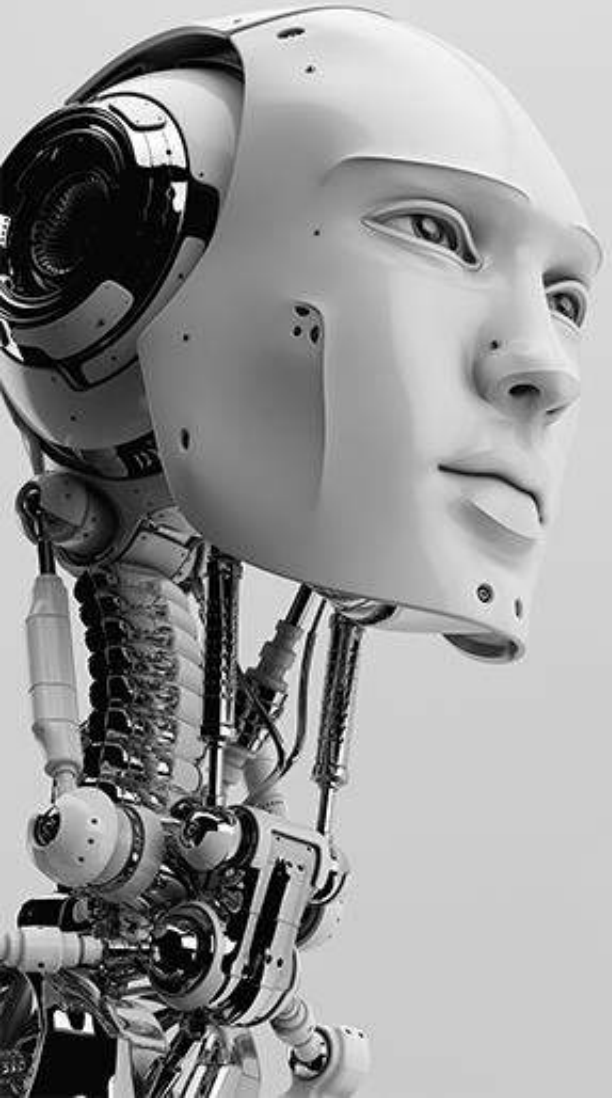


Softwares Available

- Dragon NaturallySpeaking
- APP
- Xvoice Speech Recognition
- Open mind Speech
- IVOS
- Speech Vibe 2.0.4
- Fake Voice1.691

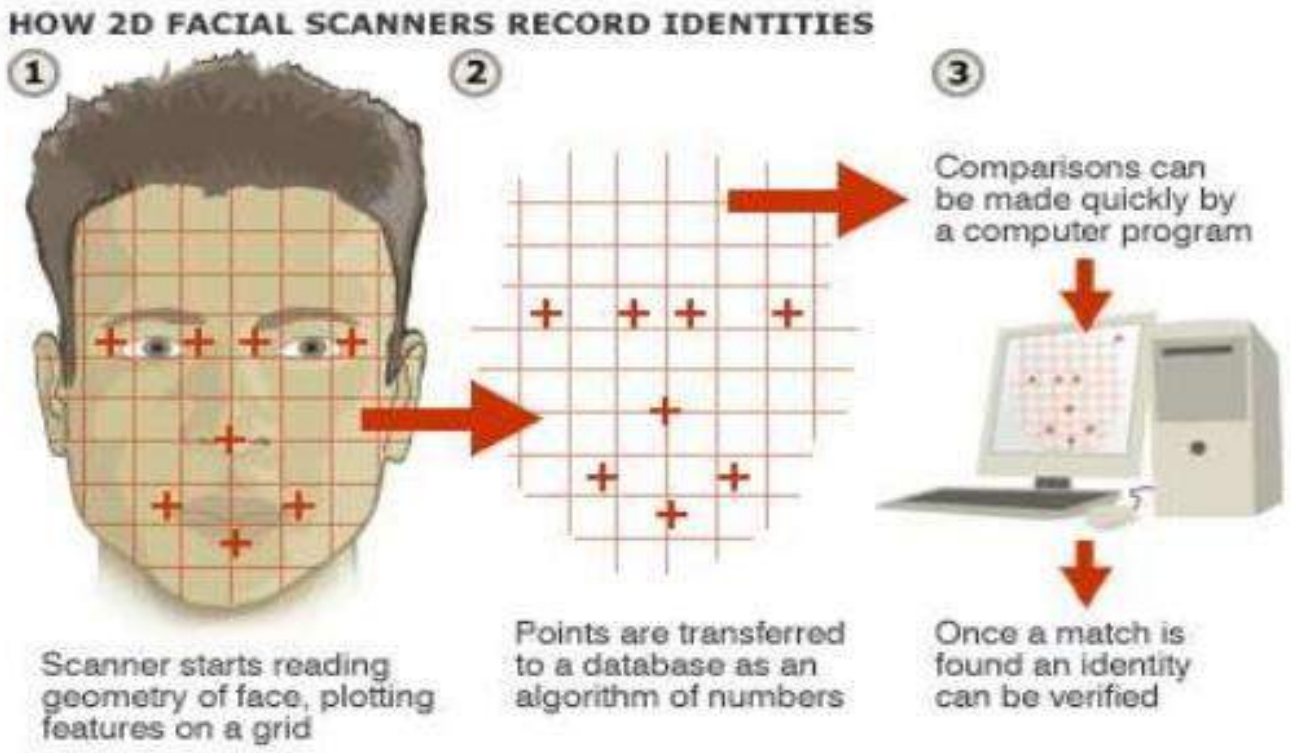


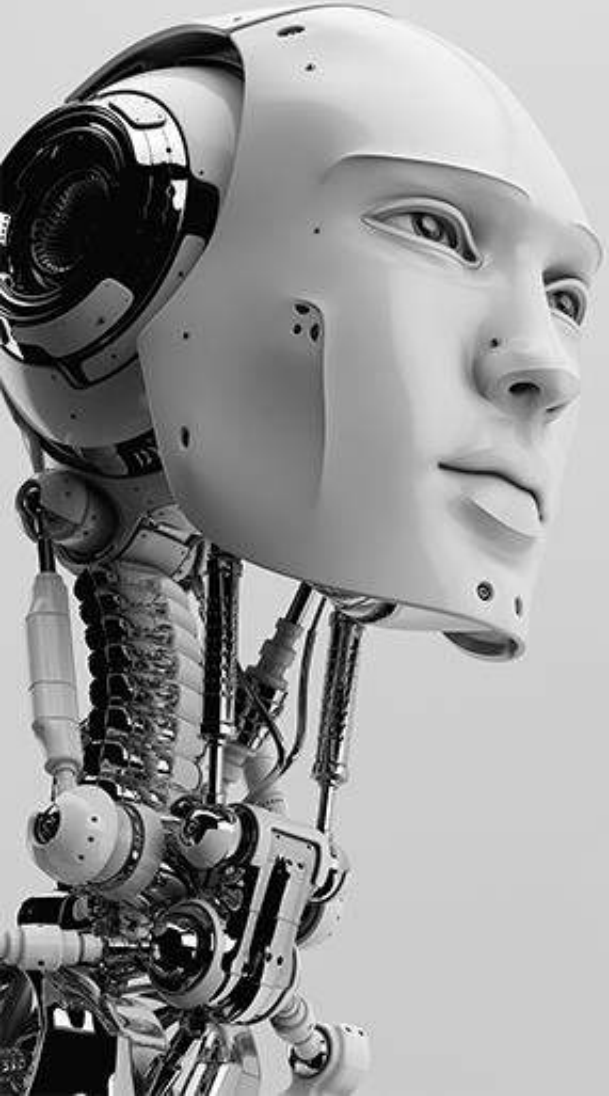

Facial Recognition



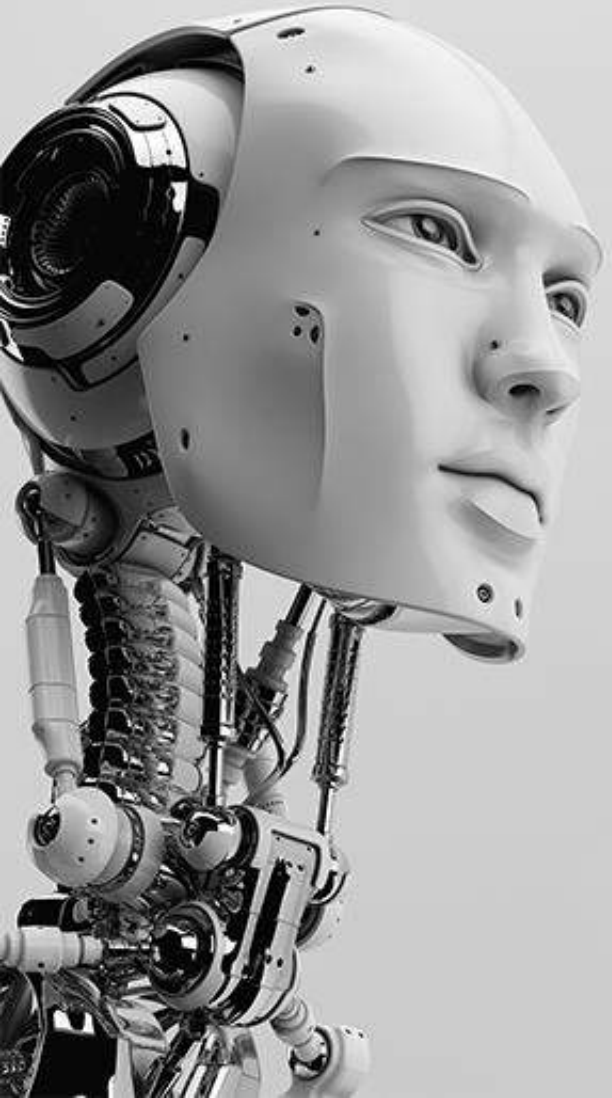
Facial Recognition

- Computer application for automatically identifying or verifying a person from a digital image or a video frame from a video.



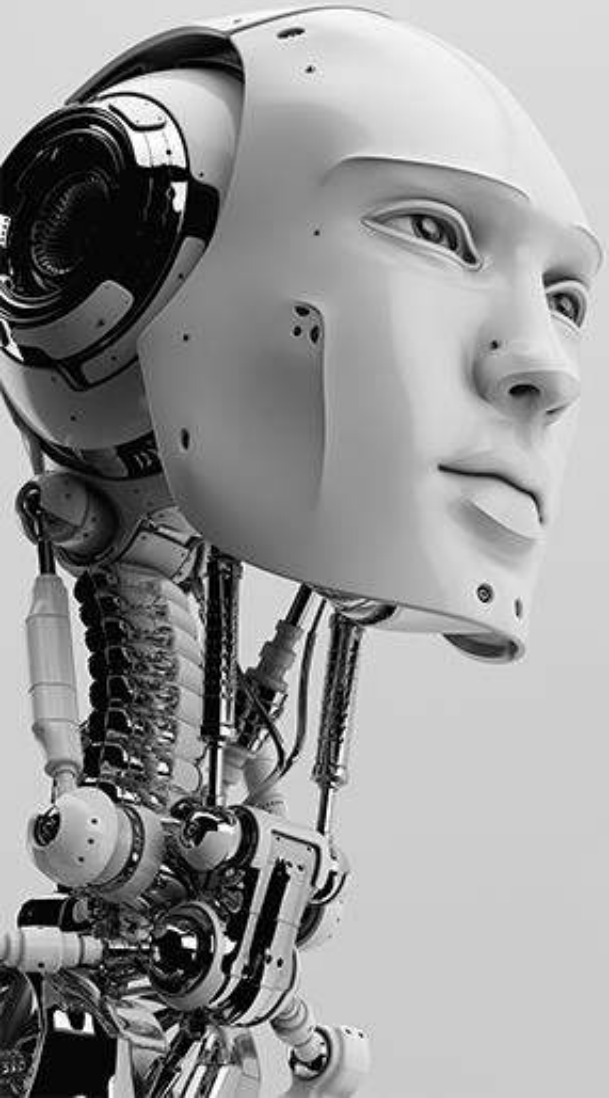



X-45A
UCAV
MILITARY



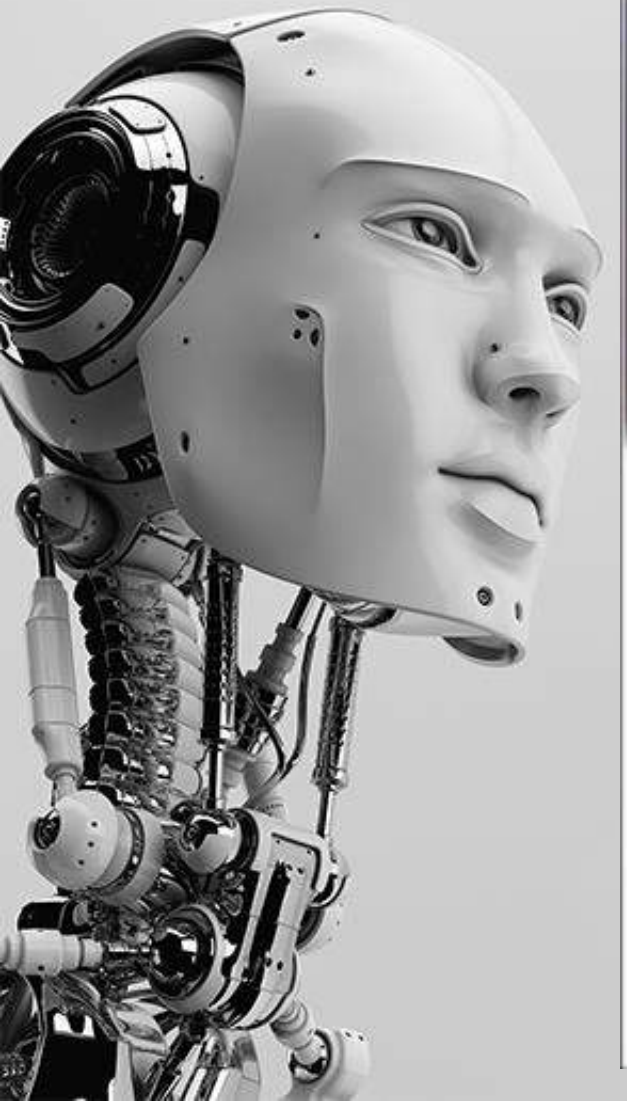
High- performance fighter aircraft

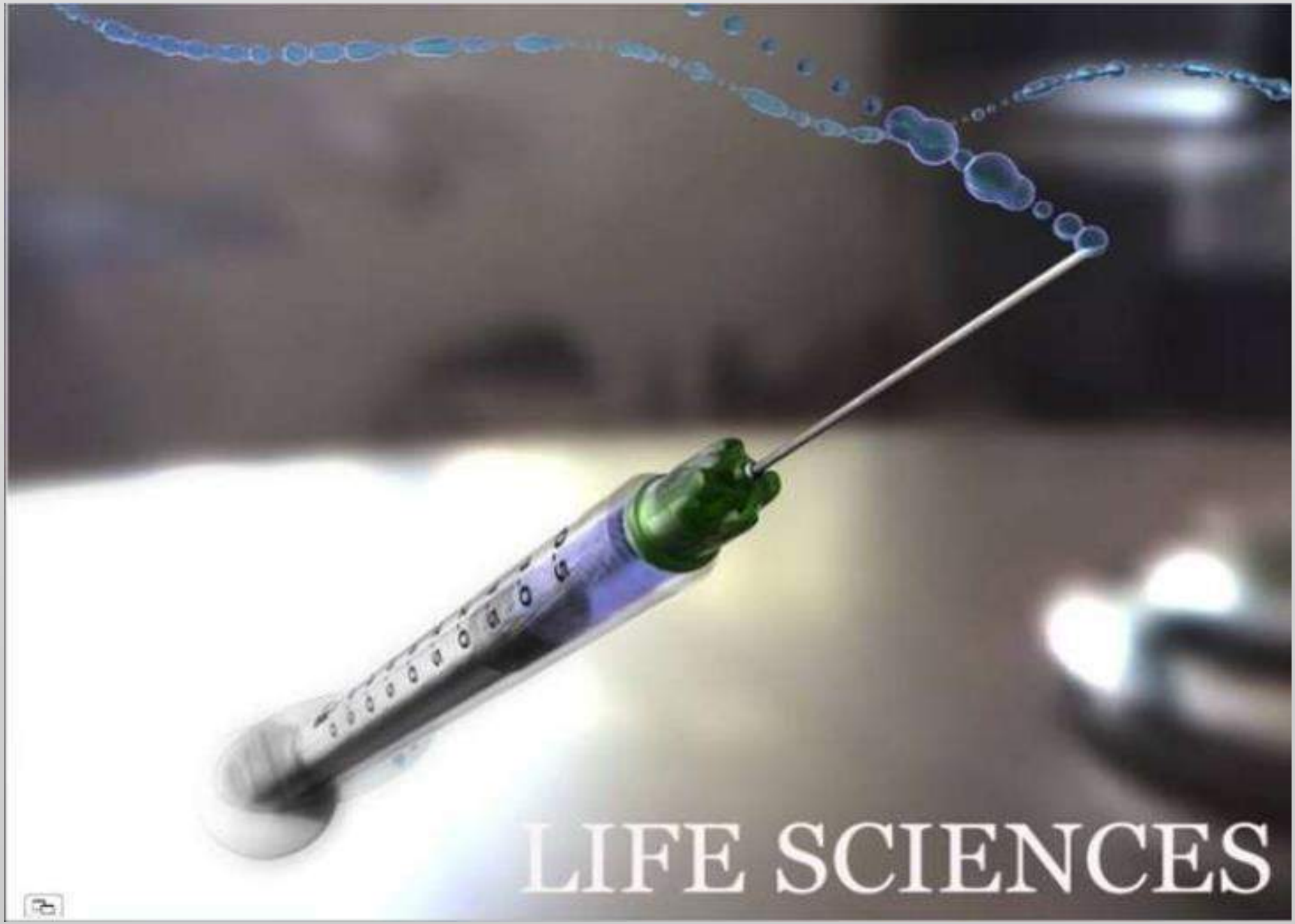
- In these programs, speech recognizers have been operated successfully in fighter aircraft with applications including: setting radio frequencies, commanding an autopilot system, setting steer-point co-ordinates and weapons release parameters, and controlling flight displays.

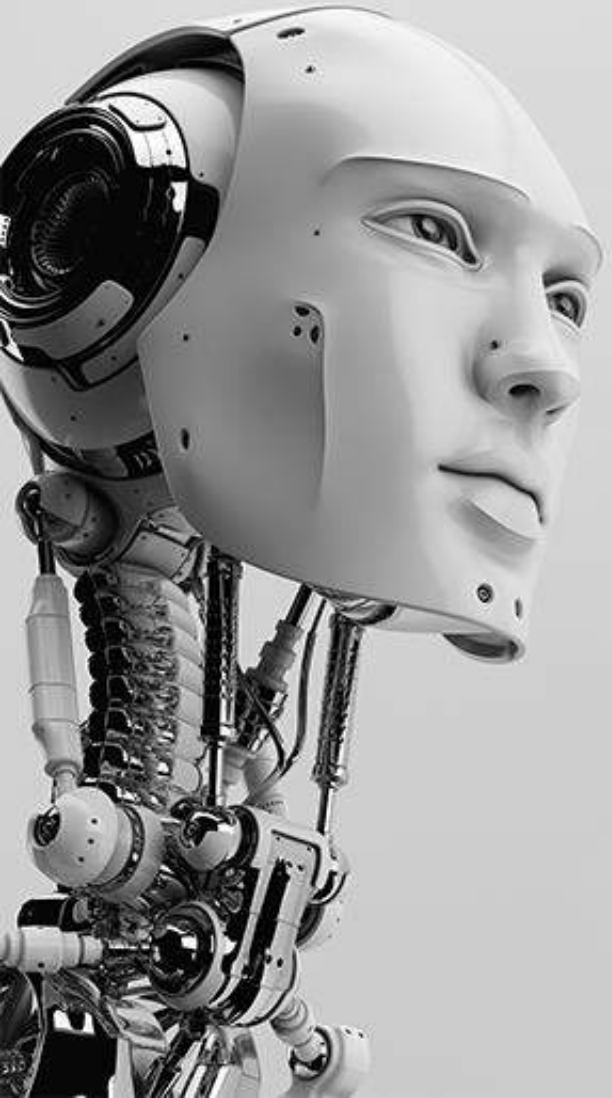


AI in Military

- Military
  - Unmanned aerial vehicles
  - Autonomous submersibles
  - Unmanned surveillance in shallow waters

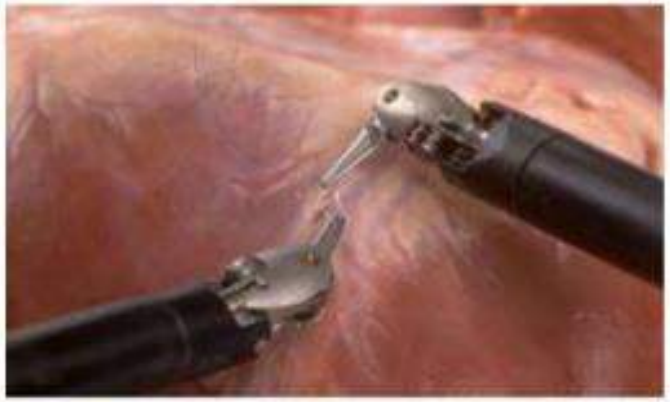


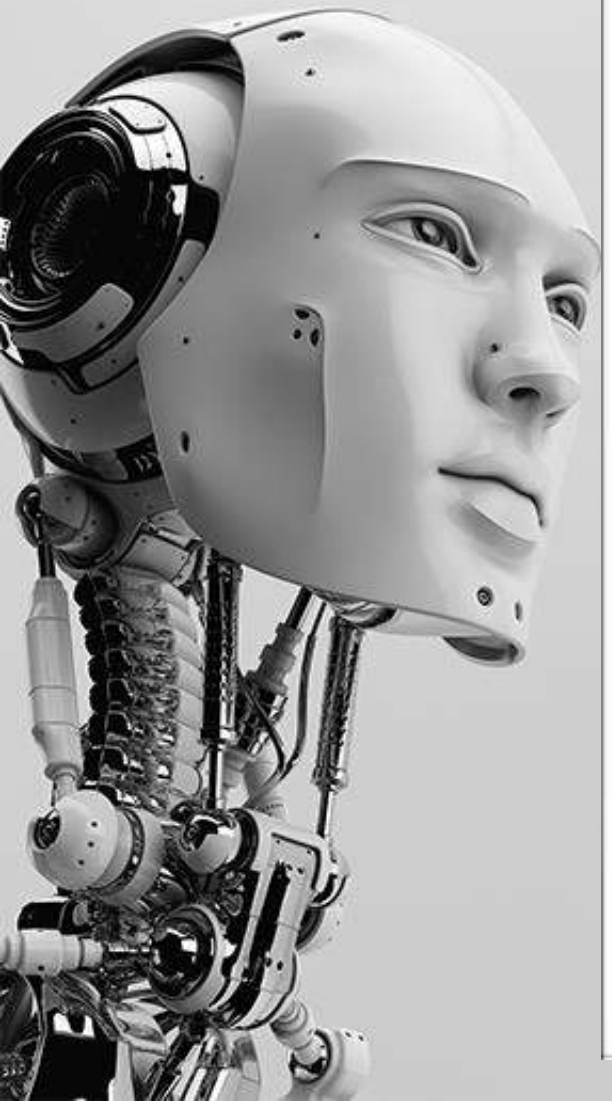

LIFE SCIENCES



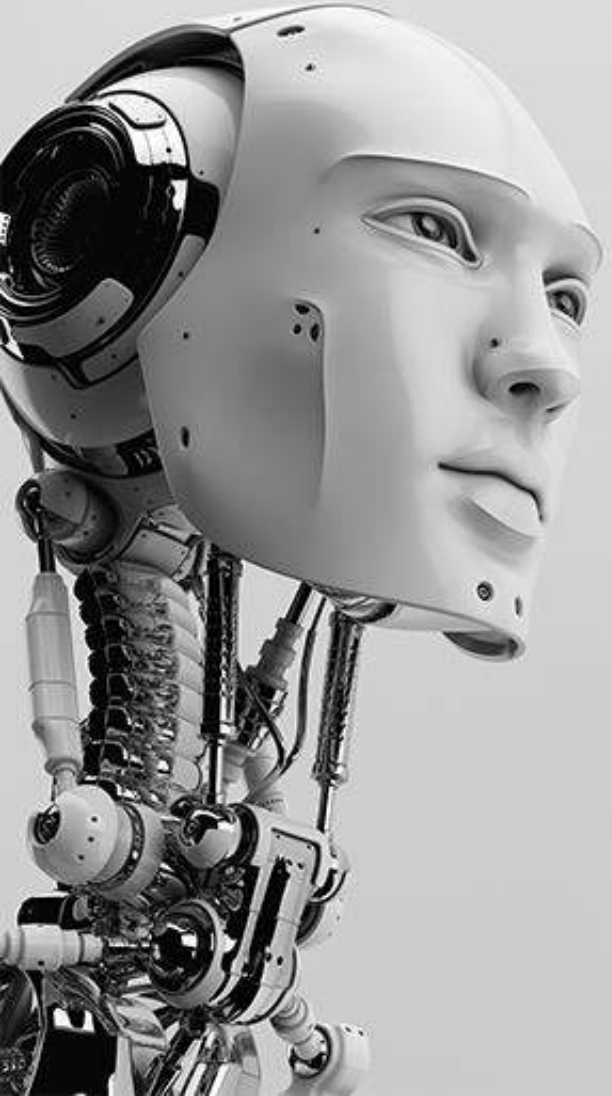
Life Sciences

- Diagnostic programs
  - Doctors input the symptoms of the patience and the AI helps decide what medications are best.
    - Disease symptoms
    - Medical history
    - Test results of a patient



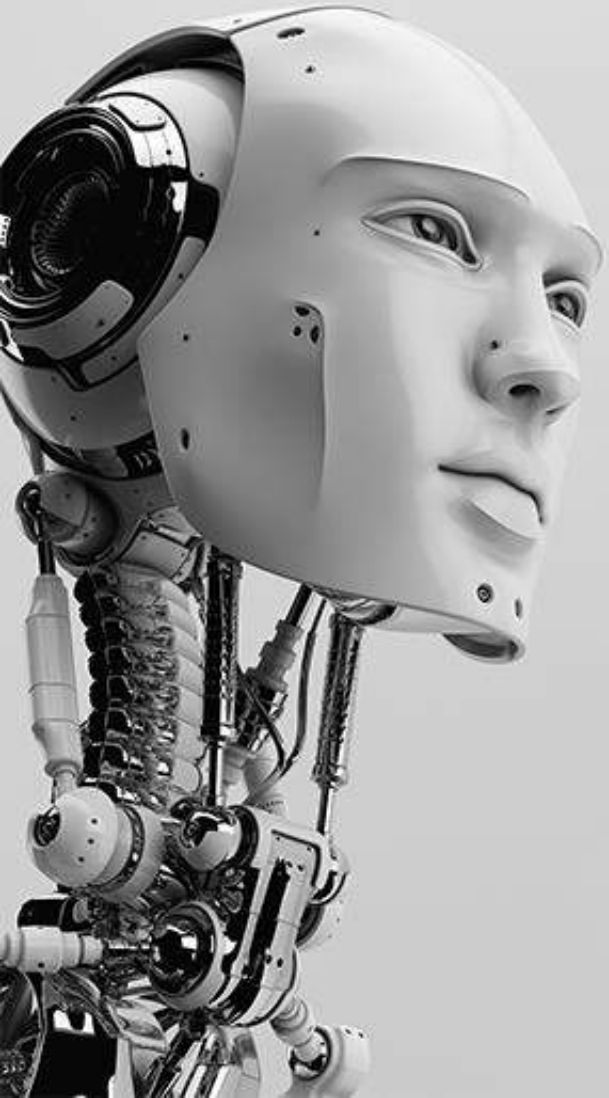


ROBOTICS



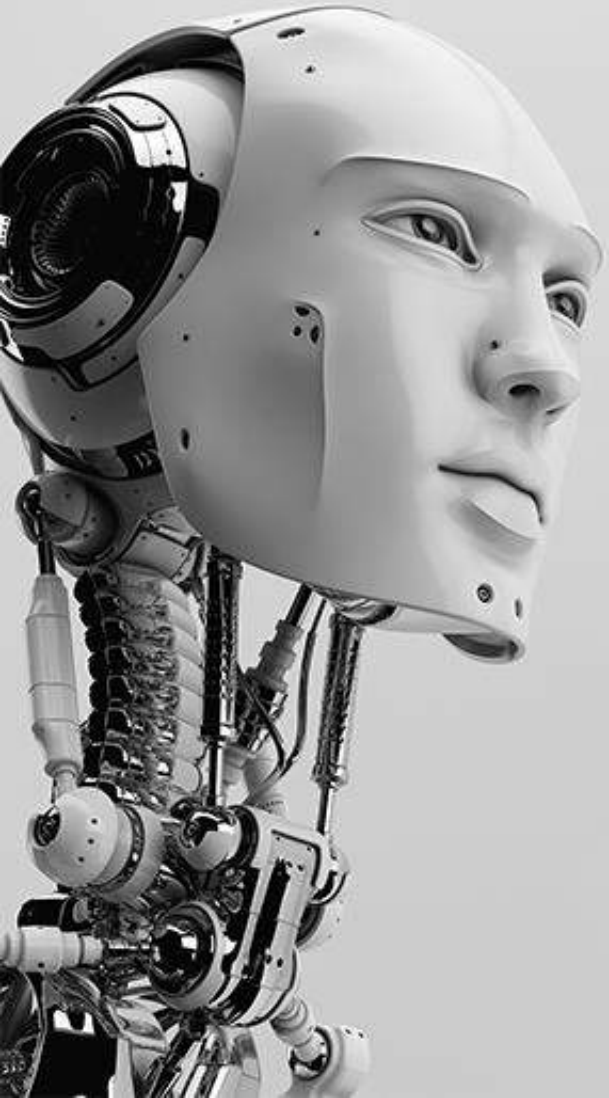
Robotics

- Robotics is a science and technology of robots, and their design, manufacture and application.
- Intelligence is required for robots to be able to handle such tasks as object manipulation and navigation, with sub-problems of localization, mapping and motion planning.



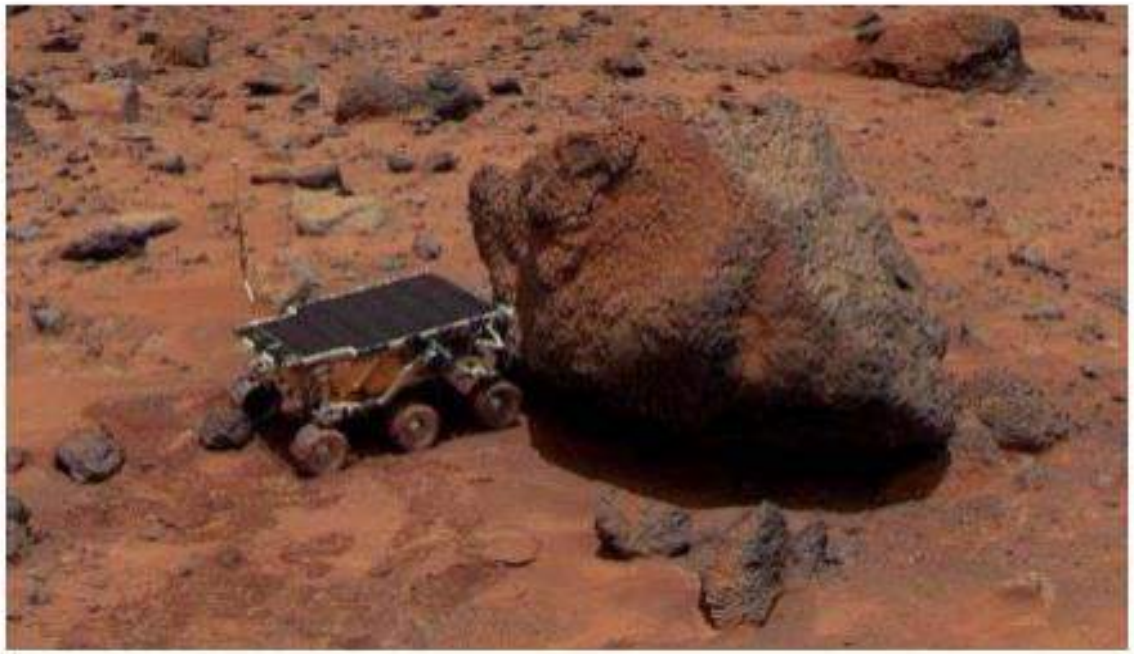
Robotics Today- Applications

2001: A robot vacuum cleaner.

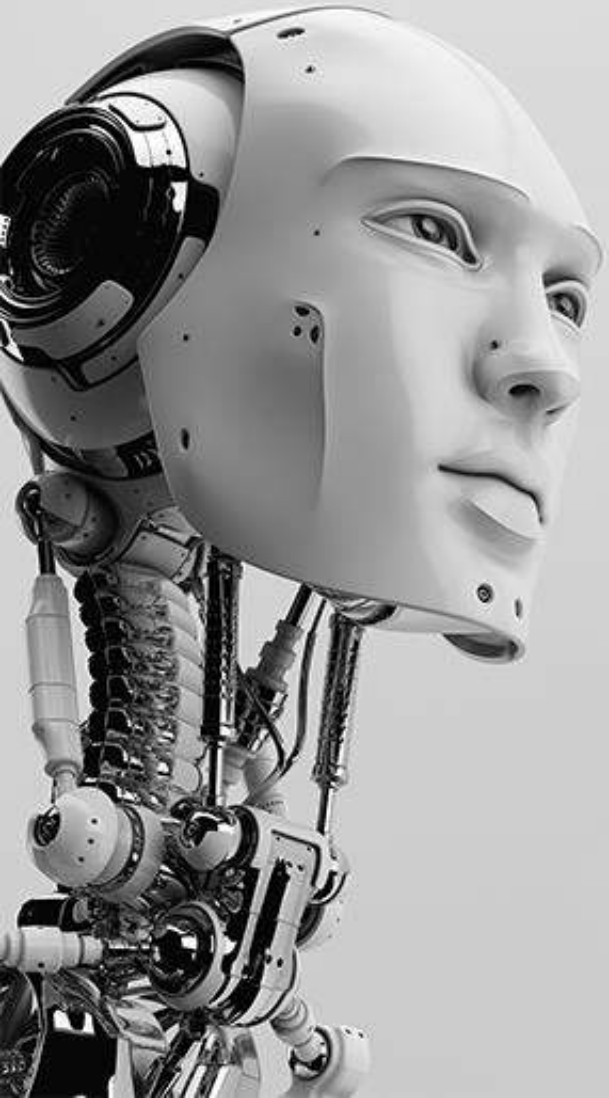


Robotics Today- Applications

Outer Space- Sojourner

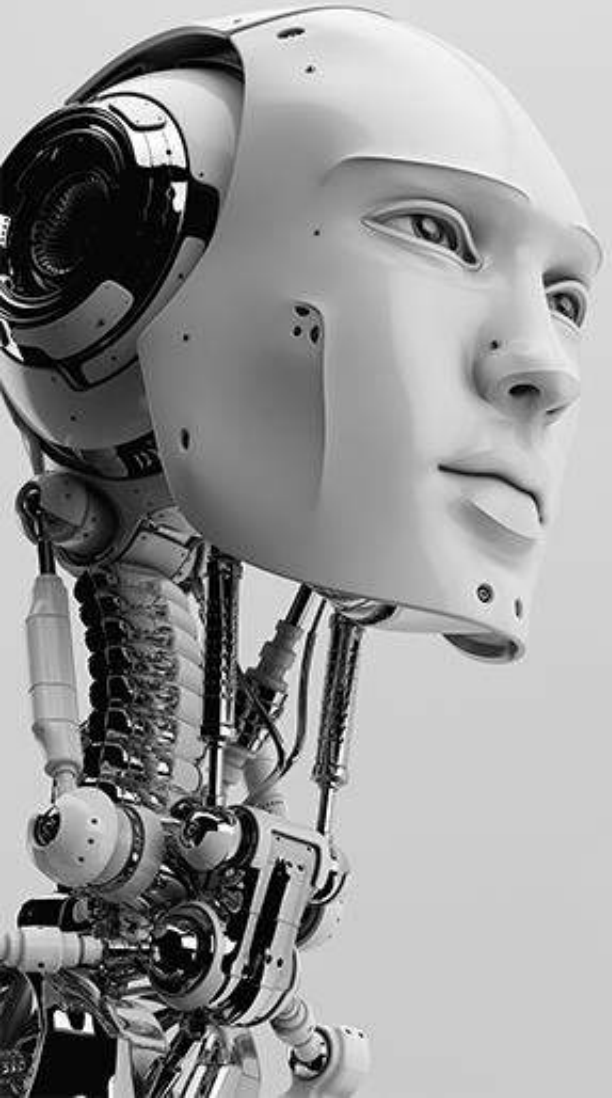


Oct. 30, 1999 Sojourner on Mars. Powered by a 1.9 square foot solar array, Sojourner can negotiate obstacles tilted at a 45 degree angle. It travels at less than half an inch per second.



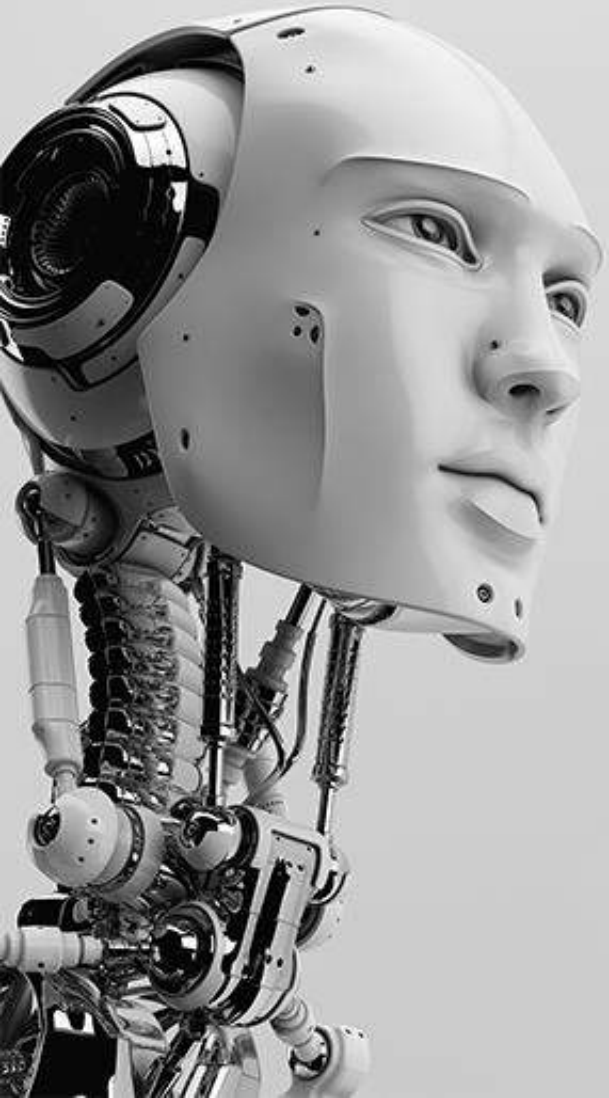
Robotics Today- Applications

1999: Sony's AIBO Pet Dog.

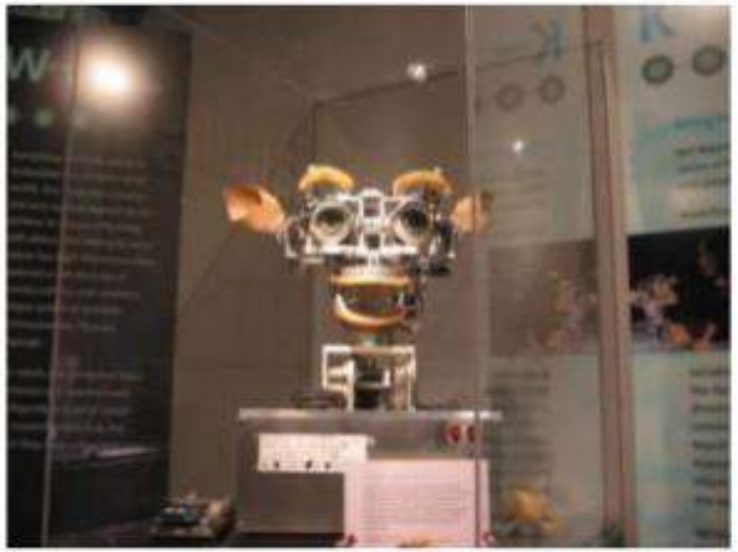


Robotics Today- Applications

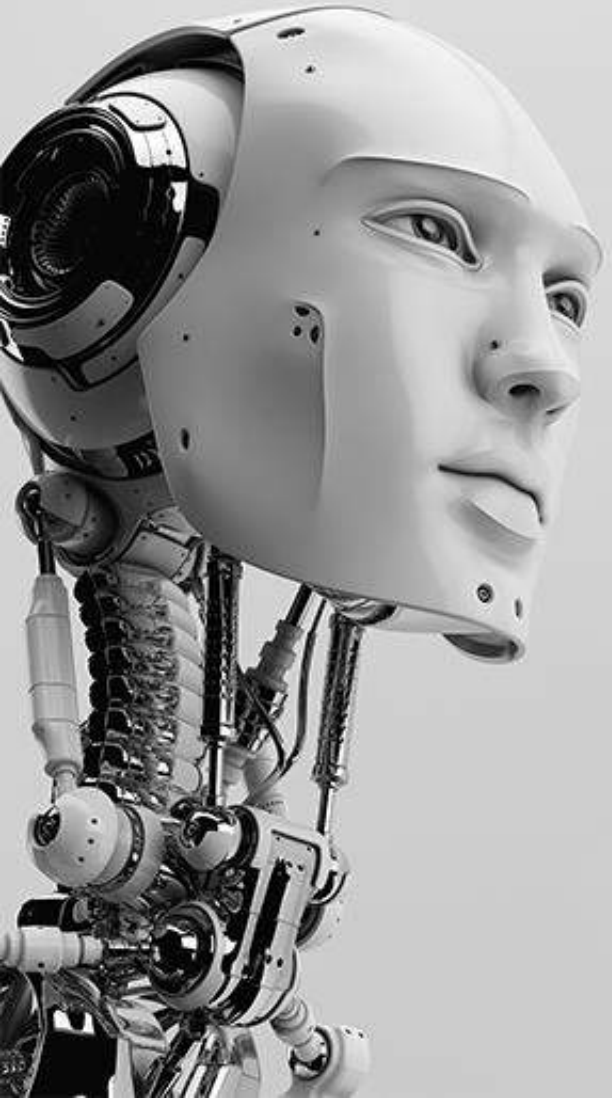
ASIMO is a humanoid robot created by Honda. It uses sensors and Intelligent algorithms to avoid obstacles and navigate stairs.



Robotics Today- Applications

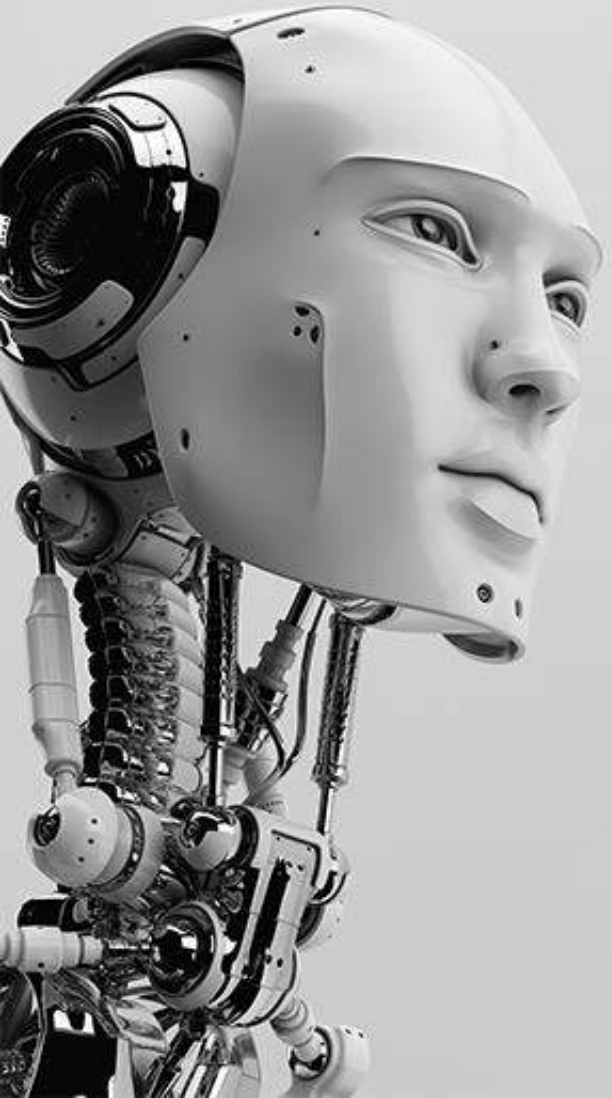


Kismet is a robot made in the late 1990s at Massachusetts Institute of Technology with auditory, visual and expressive systems intended to participate in human social interaction and to demonstrate simulated human emotion and appearance.

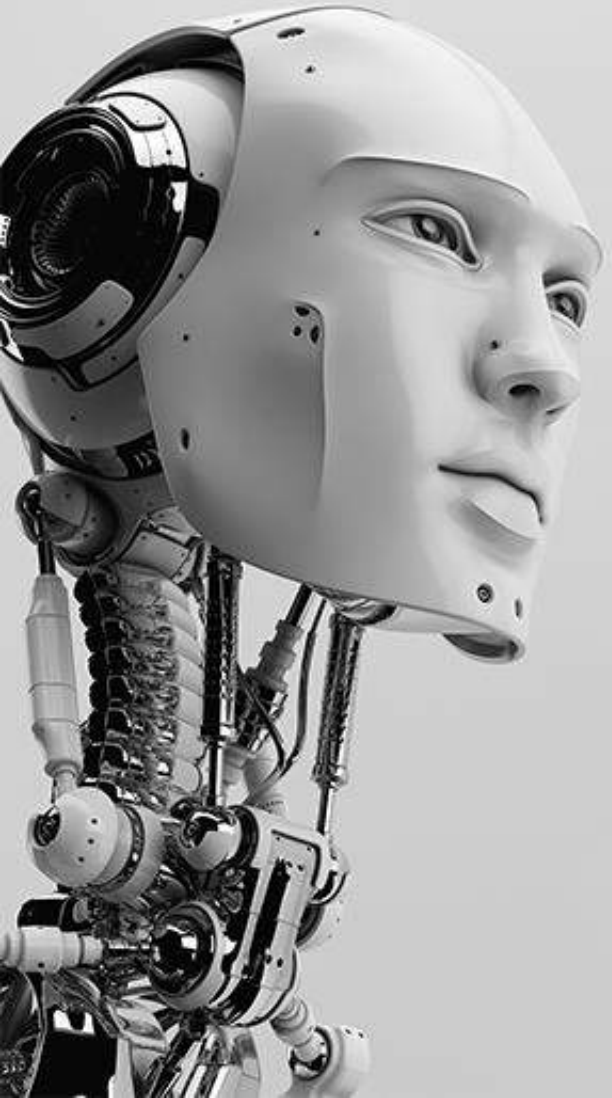


Robotics Today- Applications

TOSY Robotics is the first Vietnamese robots manufacturing company best known for the development of TOPIO - a robot that can play Ping-Pong with humans.

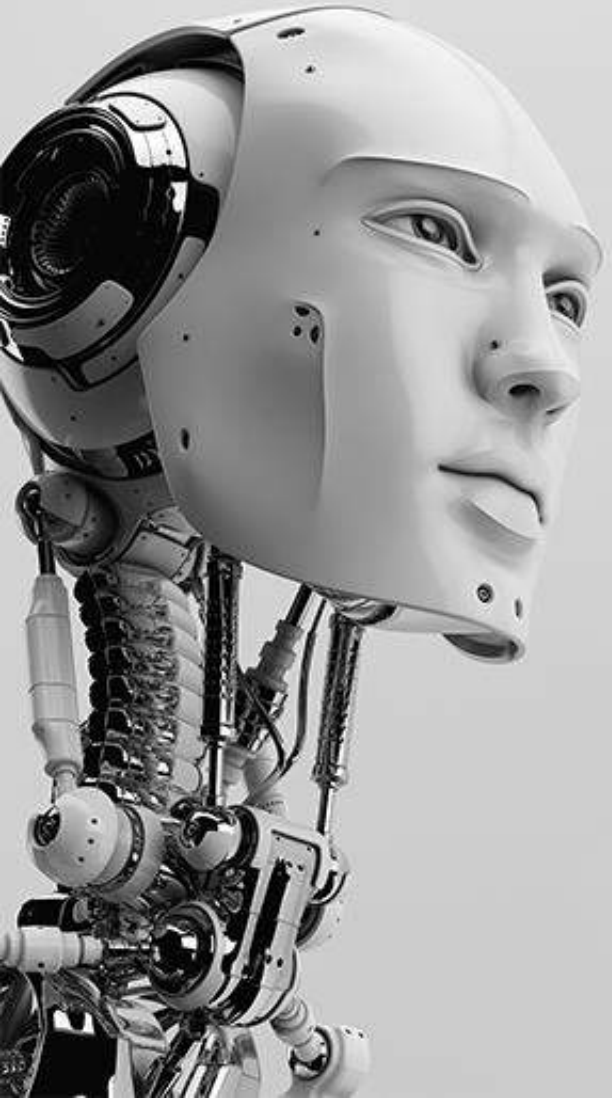


ADVANTAGES & DISADVANTAGES



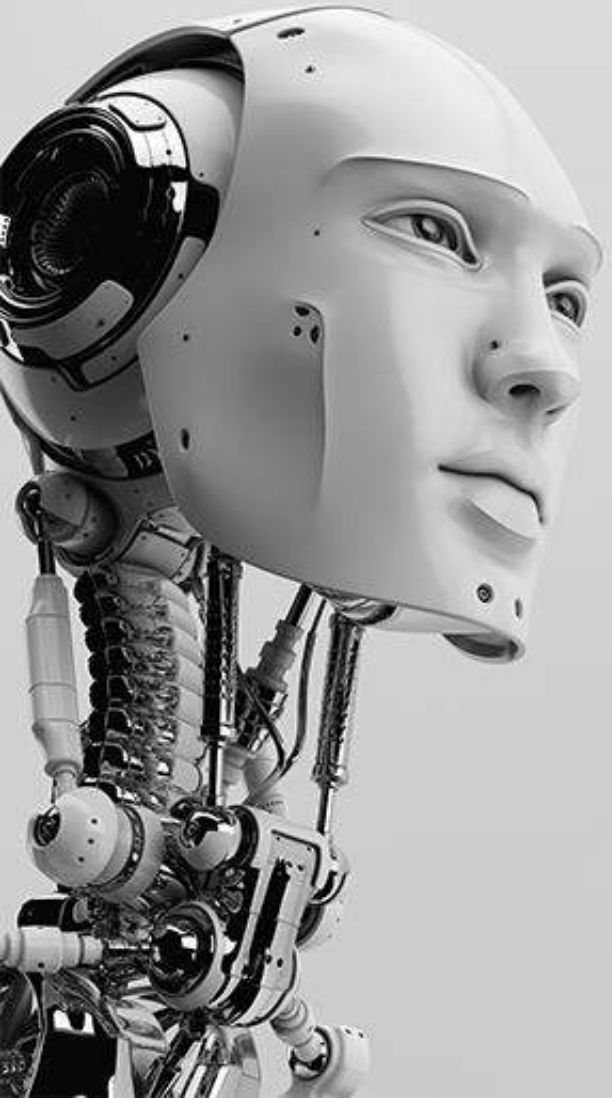
Advantages of A.I.

- ***Artificial intelligence would not need any sleep***, as well as other issues that plague biological minds like restroom breaks and eating.
- ***Unemotional consideration of problems***. 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.



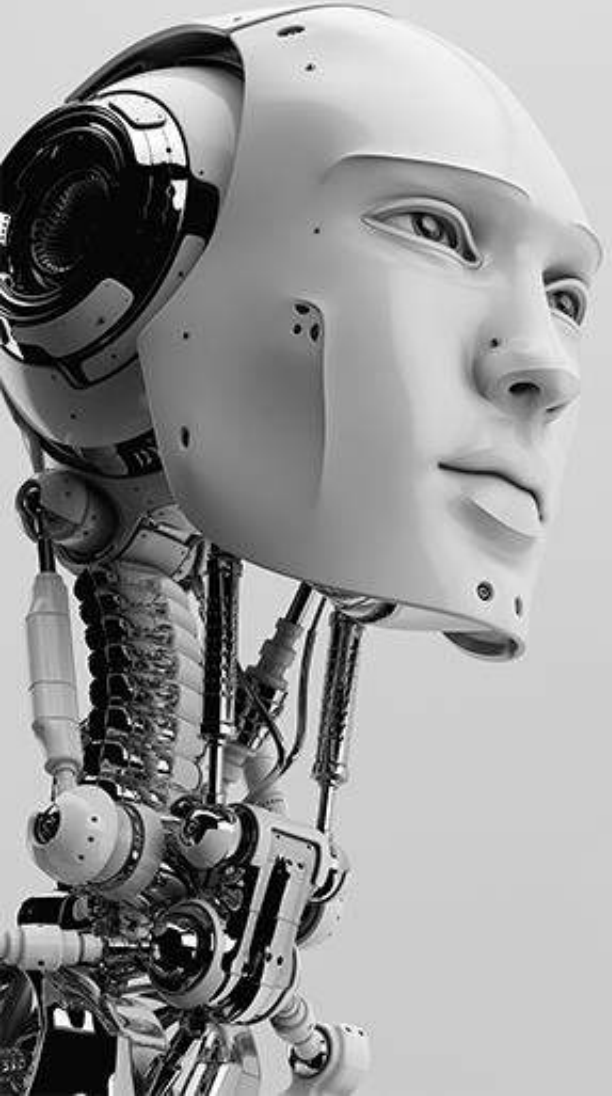
Disadvantages(Risks)

- ***Self-modifying,*** when combined with ***self-replicating,*** can lead to dangerous, unexpected results, such as a new and frequently mutating computer virus.
- ***The inability to heal***. Biological systems can heal with time and treatment. Most computer systems, on the other hand, often need to be shut down for maintenance.
- ***Military robots*** may make it possible for a country to indiscriminately attack less-advanced countries with few, if any, human casualties.
- Rapid advances in AI could mean massive ***structural unemployment***



Future of AI

- The Near future
  - Right now, Ai is about at the same place the personal computer industry was in 1978
  - Even now we have robots taking jobs.
  - Right now Japan uses about 320 robots of all sorts per 10,000 employees, while Germany uses 148 industrial robots per 10,000 employees, Italy 116, Sweden 99 and between 50 and between 50 and 80 each in the US.

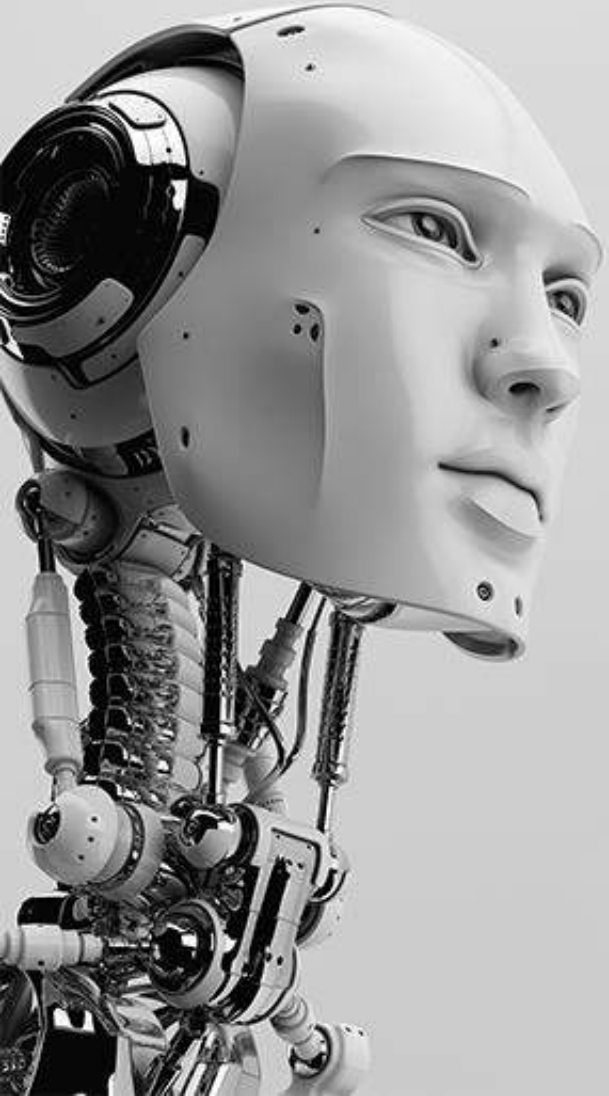


Future of AI

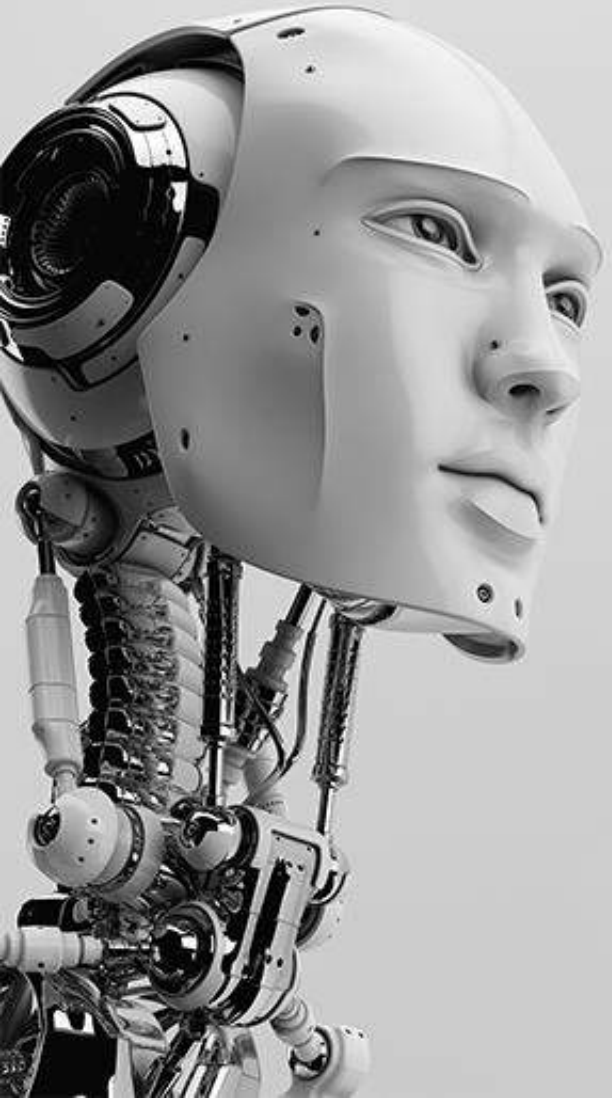
- The Distant Future
  - Ai and robots are far behind computers but it'll only be a matter of time before they become as regular as cell phones are in our everyday life.

  - Ray Kurzweil has used Moore's law (which describes the relentless exponential improvement in digital technology with uncanny accuracy) to calculate that desktop computers will have the same processing power as human brains by the year 2029, and that by 2045 artificial intelligence will reach a point where it is able to improve *itself* at a rate that far exceeds anything conceivable in the past.

  - Several futurists and science fiction writers have predicted that human beings and machines will merge in the future into Cyborgs that are more capable and powerful than either. This idea, called trans-humanism.

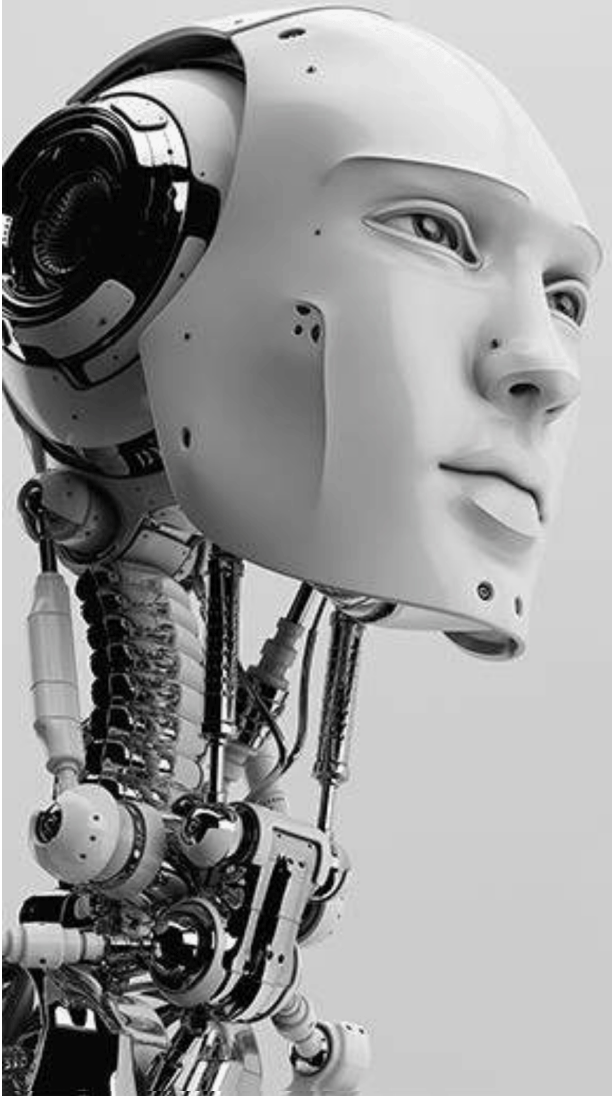


AI - TODAY



CONCLUSION

- Even though, the human brain is highly capable and is the most intelligent being, the future is bright to develop machines which can think.
- It may also happen that one day the machines may start ruling over us, because of their better intelligence and ability.



Thank You!

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