History of Artificial Intelligence

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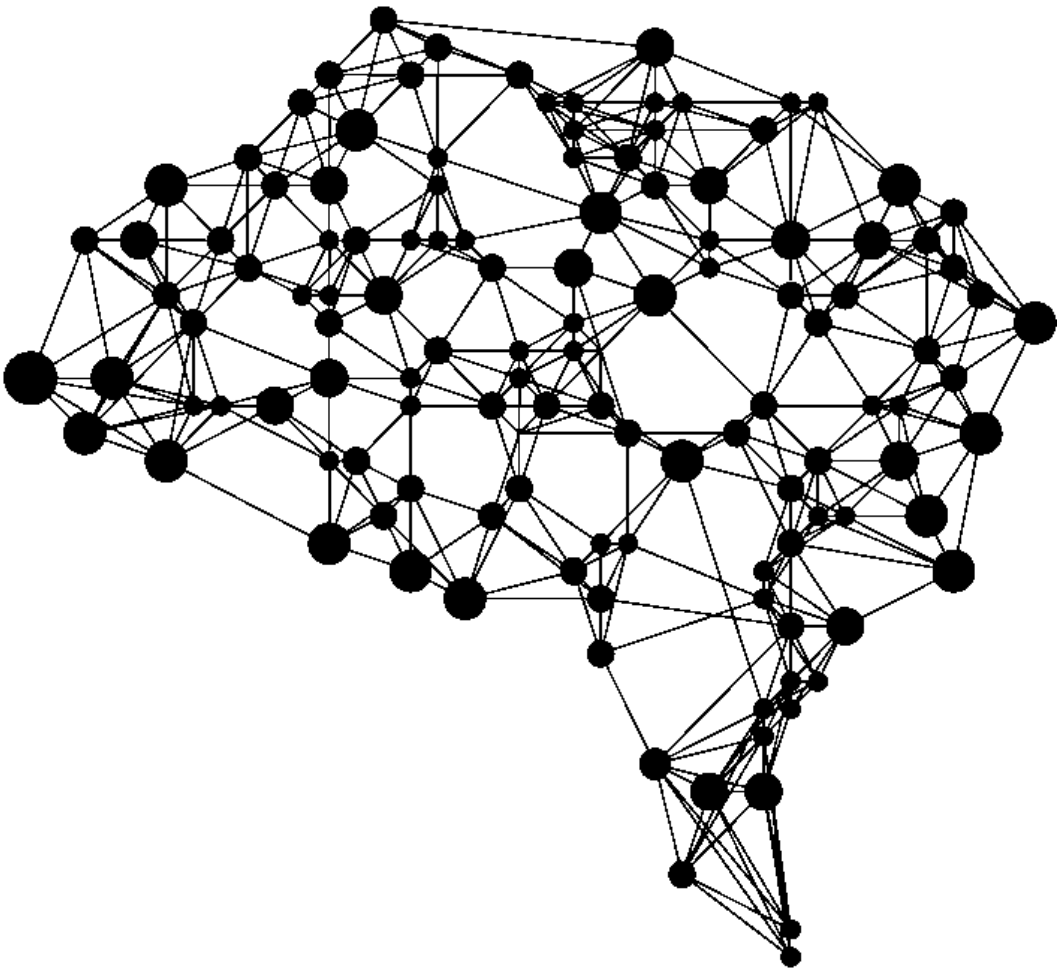

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2015

History of Artificial Intelligence

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Abstract___Artificial intelligence is finding its way into ever more areas of life. The latest craze is AI chips and related applications on the smartphone. However, technology began as early as the 1950s with the Dartmouth Summer Research Project on Artificial Intelligence at Dartmouth College, USA. The beginnings go even further back to the work of Alan Turing - which goes back to the well-known Turing test -, Allen Newell and Herbert A. Simon. With the chess computer Deep Blue from IBM, which succeeded in 1996 as the first machine to beat the then-reigning chess world champion Garry Kasparov in a match, the artificial intelligence managed to get into the focus of the world public. In data centers and on mainframes, AI algorithms have been used for many years.

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I. INTRODUCTION

In recent years, incredible progress has been made in computer science and AI. Watson, Siri or Deep Learning show that AI systems are now delivering services that must be considered intelligent and creative. And there are fewer and fewer companies today that can do without artificial intelligence if they want to optimize their business or save money.

AI systems are undoubtedly very useful. As the world becomes more complex, we need to leverage our human resources and high-quality computer systems help. This also applies to applications that require intelligence. The other side of the AI medal is: The possibility that a machine might possess intelligence scares many. Most people believe that intelligence is something unique, which is what distinguishes Homo sapiens. But if intelligence can be mechanized, what is unique about humans and what sets it apart from the machine? The quest for an artificial copy of man and the complex of questions involved are not new. The reproduction and imitation of thought already occupied our ancestors. From the sixteenth century, it was teeming with legends and the reality of artificial creatures. Homunculi, mechanical automata, the golem, the Mälzel chess automaton, or Frankenstein were all imaginative or real attempts in the past centuries to artificially produce intelligences and to imitate what is essential to us.

The idea of making inanimate objects into intelligent beings by giving life a long time is fascinating the mind of mankind. Ancient Greeks had myths about robotics, and Chinese and Egyptian engineers made automatons. We can see the traces of the beginning of modern artificial intelligence as an attempt to define the classical philosophers' system of human thought as a symbolic system. However, the field of artificial intelligence was not formally established until 1956. In 1956, a conference "Artificial Intelligence" was held for the first time in Hanover, New Hampshire, at Dartmouth College. Cognitive scientist Marvin Minsky at MIT and other scientists participating in the conference were quite optimistic about the future of artificial intelligence. As Minsky stated in his book "AI: The Tumultuous Search for Artificial Intelligence": "In a generation, the problem of artificial intelligence creation will be solved at a significant level."

One of the most important visionaries and theoreticians was Alan Turing (1912-1954): in 1936, the British mathematician proved that a universal calculator - now known as the Turing machine - is possible. Turing's central insight is that such a machine is capable of solving any problem as long as it can be represented and solved by an algorithm. Transferred to human intelligence, this means that if cognitive processes can be algorithm can be broken down into finite well-defined individual steps they can be executed on one machine. A few decades later, the first practical digital computers were actually built. Thus, the "physical vehicle" for artificial intelligence was available

The British mathematician Alan Turing, father of modern computing and key man for the British victory in World War II by cracking the Nazi code "unbreakable" Enigma, has finally received a royal pardon that tries to amend his criminal conviction for being homosexual, a fact that led to suicide

Alan Turing

The electromechanical machine of Turing, considered a precursor of modern computers, managed to unlock the code used by the German submarines in the Atlantic. His work at Bletchley Park is considered key to the end of World War II. His work at Bletchley Park, an isolated country house north of London, was made public in the 1970s, when the role of the brilliant mathematician in the war was revealed. The cryptographers who worked helped shorten World War II by about two years, by deciphering around 3,000 German military messages a day.

Nazi code decryption machine

Turing's team deciphered the 'Enigma' code, which the Germans considered unbreakable, and designed and developed Colossus, one of the first programmable computers. But after the war, Prime Minister Winston Churchill ordered the destruction of Colossus computers and 200 'Turing bombe' machines to keep them secret from the Soviet Union.

II. ARTIFICIAL INTELLIGENCE HISTORY

To be informed about the history of artificial intelligence, it is necessary to go back to previous dates in Milat. In the Ancient Greek era, it is proven that various ideas about humanoid robots have been carried out. An example of this is Daedelus, who is said to have ruled the mythology of the wind, to try to create artificial humans. Modern artificial intelligence has begun to be seen in history with the aim of defining philosophers' system of human thought. 1884 is very important for artificial intelligence. Charles Babbage, on this date, has worked on a mechanical machine that will exhibit intelligent behavior**.** However, as a result of these studies, he decided that he would not be able to produce a machine that would exhibit as intelligent behaviors as a human being, and he took his work suspended. In 1950, Claude Shannon introduced the idea that computers could play chess. Work on artificial intelligence continued slowly until the early 1960s.

The emergence of artificial intelligence officially in history dates back to 1956. In 1956, a conference artificial intelligence session at Dartmouth College was introduced for the first time. Marvin Minsky stated in his book "Stormed Search for Artificial Intelligence " that "the problem of artificial intelligence modeling within a generation will be solved ". The first artificial intelligence applications were introduced during this period. These applications are based on logic theorems and chess game. The programs developed during this period were distinguished from the geometric forms used in the intelligence tests; which has led to the idea that intelligent computers can be created.

III. MILESTONES FOR AI HISTORY

In 1950, Alan Turing created a test to determine whether a machine was intelligent. This test shows the intelligence given to computers. The intelligence level of the machines that passed the test at that time was considered adequate. LISP (List Processing Language), developed by John McCarthy in 1957, is a functional programming language developed for artificial intelligence. One of the rather old and powerful programming languages , LISP is a language that allows you to create flexible programs that represent basic operations with list structure. Between 1965 and 1970, it could be called a dark period for artificial intelligence. The developments on artificial intelligence in this period are too few to be tested. The hasty and optimistic attitude due to the unrealistic expectations that have emerged has led to the idea that it will be easy to uncover the machines with intelligence. But this period was named as a dark period on behalf of artificial intelligence because it did not succeed with the idea of creating intelligent machines by simply uploading data .Between 1970 and 1975, artificial intelligence gained momentum. Thanks to the success achieved in artificial intelligence systems that have been developed and developed on subjects such as disease diagnosis, the basis of today's artificial intelligence has been established. During the period 1975-1980 they developed the idea that they could benefit artificial intelligence through other branches of science such as psychology.

Artificial Intelligence began to be used in large projects with practical applications in the 1980s. The next time the daylight is passed, the artificial intelligence has been adapted to solve real life problems. Even when the needs of users are already met with traditional methods, the use of artificial intelligence has reached to a much wider range thanks to more economical software and tools.

History of AI with Chronological Order:

- **May 1. year:** Alexander Heron in antiquity made automatons with mechanical mechanisms working with water and steam power.
- **1206:** Ebru İz Bin Rezzaz Al Jezeri, one of the pioneers of cybernetic science, has made water-operated automatic controlled machines.
- **1623:** Wilhelm Schickard invented a mechanic and a calculator capable of four operations.
- **1672:** Gottfried Leibniz has developed a binary counting system that forms the abstract basis of today's computers.
- **1822-1859:** Charles Babbage is a mechanical calculator. Ada Lovelace is regarded as the first

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computer programmer because of the work he has done with Babbage's punched cards on his machines. Lovelace's work includes algorithms.

- **1923:** Karel Capek first introduced the robot concept in the theater play of Rossum's Universal Robots (RUR - Rossum's Universal Robots).
- **1931:** Kurt Gödel introduced the theory of deficiency, which is called by his own name.
- **1936:** Konrad Zuse developed a programmable computer named Z1 named 64K memory.
- **1946:** ENIAC (Electronic Numerical Integrator and Computer), the first computer in a room size of 30 tons, started to work.
- **1948:** John von Neumann introduced the idea of self-replicating program.
- **1950:** Alan Turing, founder of computer science, introduced the concept of the Turing Test.
- **1951: The** first artificial intelligence programs for the Mark 1 device were written.
- **1956: The** logic theorist (Logic Theory-LT) program for solving mathematical problems is introduced by Neweell, Shaw and Simon. *The system is regarded as the first artificial intelligence system.*
- The end of the 1950s - the beginning of the 1960s**:** A schematic network for machine translation was developed by Margaret Masterman et al.
- **1958:** John McCarty of MIT created the LISP (list Processing language) language.
- **1960:** JCR Licklider described the human-machine relationship in his work.
- **1962:** Unimation was established as the first company to produce robots for the industrial field.
- **1965:** An artificial intelligence program ELIZA is written.
- **1966:** The first animated robot "Shakey" was produced at Stanford University.
- **1973**: DARPA begins development for protocols called TCP / IP.
- **1974:** The Internet has begun to be used for the first time.
- **1978:** Herbert Simon earned a Nobel Prize for his limited Rationality Theory, which is an important work on Artificial Intelligence.
- **1981:** IBM produced the first personal computer.
- **1993:** Production of Cog, a human-looking robot at MIT, began.
- **1997:** Deep Blue named supercomputer defeated world famous chess player Kasparov.
- **1998:** Furby, the first artificial intelligence player, was driven to the market.
- **2000:** Kismet named robot which can use gesture and mimic movements in communication is introduced.
- **2005:** Asimo, the closest robot to artificial intelligence and human ability and skill, is introduced.
- **2010:** Asimo is made to act using mind power

IV. WHAT IS ARTIFICIAL INTELLGENCE?

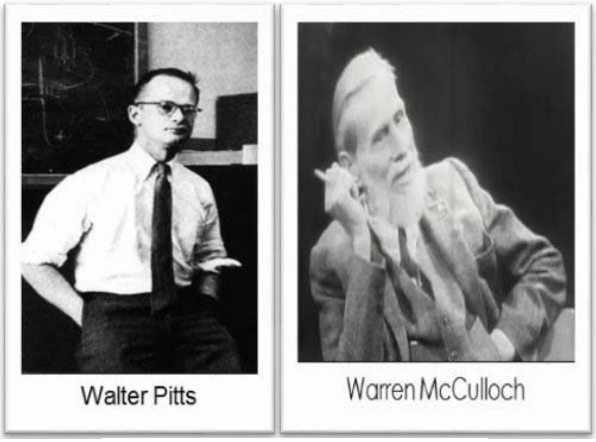
Artificial intelligence is the general name of the technology for the development of machines, which are created entirely by artificial means and can exhibit behaviors and behaviors like human beings, without taking advantage of any living organism.

Artificial intelligence products, which, when approached as an idealist, are completely human like and can perform things such as feeling, foreseeing, and making decisions, are generally called robot names.

The artificial intelligence of which the first steps are being taken by the question of Mathison Turing by the question "Can machines be considered?" Is one of the most important factors in the emergence of various military weapon technologies and the development of computers during the period of World War II.

The concept of Machine Intelligence emerging with various code algorithms and data studies reveals that all the technological devices produced from the first computers to today's smart phones are developed on the basis of people. The artificial intelligence, which was developed very slowly in the old periods but so important steps as the day-to-day, reveals how much progress has been made with the emergence of gifted robots today.

McCulloch and Pitts introduced the ability to assign various functions to robots by utilizing artificial intelligence studies, artificial nerve cells and different science branches at the product development focus pointing to human behaviors. Nevertheless, the first steps of the one-arm robot workers in the factory were taken. In 1956, McCarthy, Minsky, Shannon and Rochester in the study process conducted by the artificial intelligence put forward the name McCarthy, artificial intelligence could be described as the father of the name.



Warren McCulloch & Walter Pitts

Although symbolic and cybernetic artificial intelligence studies have different currents, the two currents faced a bad

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start at the beginning and could not be maintained as expected on both sides. In the symbolic artificial intelligence studies, robots cannot give exactly the expected responses and answers to the questions of the people, whereas on the cybernetic artificial intelligence side, the artificial neural networks do not give the expectation and the works on the two sides cannot be successful with literally.

Artificial intelligence has led to the emergence of specialized artificial intelligence exercises that will continue with a single purpose, rather than different branches and minds, after failures in Symbolic and Cybernetic artificial intelligence studies developed on different sides.

While the concept of artificial intelligence has stimulated artificial intelligence studies, the fact that artificial intelligence products do not have enough knowledge about what is being worked on has brought about various problems. However, the artificial intelligence developers who brought rational solutions to the problems that have arisen, have reached to commercial level of artificial intelligence, and the artificial intelligence industry that emerged in the coming periods has shown that the achievement of successful works is achieved with billion dollar billets.

Recent developments in artificial intelligence studies have revealed the importance of language. As anthropology, Human Science studies show, people have begun to hold the language in front of the artificial intelligence studies in recent years because people think with language and put out various functions.

Later, a number of artificial intelligence marking languages appeared with the language studies that were behind those who supported Symbolic Artificial Intelligence studies. Today, artificial intelligence studies carried out by Symbolic artificial intelligence developers have benefited from artificial intelligence languages and have made it possible to show even robots that can speak.

V. EXPERT SYSTEMS 1975 TO 1985

In the third era, starting in the mid-1970s, they broke away from the toy worlds and tried to build practically usable systems, whereby methods of knowledge representation were in the foreground. The AI left its ivory tower and AI research also became known to a wider public. Initiated by the US computer scientist Edward Feigenbaum expert system technology is initially limited to the university area. However, little by little, expert systems developed into a small commercial success and for many were identical to all AI research just as many Machine Learning today are identical to AI.

In an expert system, the knowledge of a particular subject area is represented in the form of rules and large knowledge bases. The best known expert system was the MYCIN developed by T. Shortliffe at Stanford University. It was used to support diagnostic and therapeutic decisions in blood infectious diseases and meningitis. He was attested by an evaluation that his decisions are as good as those of an expert in the field and better than those of a non-expert. Starting with MYCIN, a large number of other expert systems with more complex architecture and extensive rules have been developed and used in various fields. In medicine, for example, PUFF (data interpretation of lung tests), CADUCEUS (diagnostics in internal medicine), in chemistry DENDRAL (analysis of molecular structure), in geology PROSPECTOR (analysis of rock formations) or in computer science the system R1 for the configuration of Computers that saved Digital Equipment Corporation (DEC) $ 40 million a year.

Even the area of language processing, in the shadow of expert system euphoria, was oriented towards practical problems. A typical example is the dialog system HAM-ANS, with which a dialogue can be conducted in various fields of application. Natural-language interfaces to databases and operating systems penetrated into the commercial market such as Intellect, F & A or DOS-MAN.

I. THE RENAISSANCE OF NEURAL NETWORKS 1985 TO 1990

In the early 1980s, Japan announced the ambitious "Fifth Generation Project," which was designed, among other things, to carry out practically applicable AI cutting-edge research. For the AI development, the Japanese favored the programming language PROLOG, which had been introduced in the seventies as the European counterpart to the US-dominated LISP. In PROLOG, a certain form of predicate logic can be used directly as a programming language. Japan and Europe were largely PROLOG-dominated in the sequence, in the US continued to rely on LISP.

In the mid 80's the symbolic AI got competition from the resurrected neural networks. Based on brain research results, McCulloch, Pitts, and Hebb first developed mathematical models for artificial neural networks in the 1940s. But then lacked powerful computers. Now in the eighties, the McCulloch-Pitts neuron experienced a renaissance in the form of so-called connectionism.

Unlike the symbol-processing AI, connectionism is more oriented towards the biological model of the brain. Its basic idea is that information processing is based on the interaction of many simple, uniform processing elements and is highly parallel. Neural networks offered impressive performance, especially in the field of learning. The Netttalk program was able to learn how to speak using example sentences: by entering a limited set of written words with pronunciation as phoneme chains, such a net could learn how to pronounce English words correctly and apply the learned to unknown words correctly.

But even this second attempt came too early for neural networks. Although the funding was booming, but also the limits were clear. There was not enough training data, solutions for structuring and modularizing the networks were missing, and also the computers before the millennium were still too slow.

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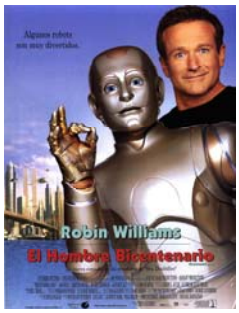
VI. THE BEST 5 FILMS IN A.I.

1- Bicentennial Man 1990



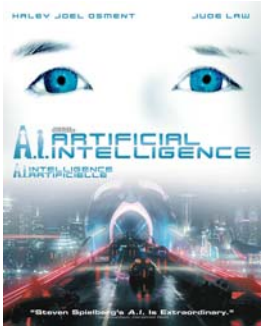
It is based on a homonymous account of Isaac Asimov himself. NDR ("Andrew") is a robot that has been acquired by a family to perform cleaning tasks. But there is something that makes him special: he is able to identify emotions, something for which no robot is programmed.

2- I Robot 2004

The script is signed by Jeff Vintar who had to incorporate, at the request of the producers, the Three Laws of Robotics and other ideas of Isaac Asimov after the Producer acquired the rights to the title of that author's book.

This time the star of the cast is Will Smith , the detective. The film did not have very good acceptance among the followers of Asimov because the bulk of the argument is not based on any of his books but only takes some of its elements

3- Artificial Intelligence (AI) (2001)



Steven Spielberg adapted a story written by Brian Aldiss entitled "The super toys last all summer" with some influence of "The Adventures of Pinocchio". In the film we meet David, a robot child capable of showing feelings like love.

All part of a Stanley Kubrick project started at the beginning of the 70s and that could not be done in his day because the computer generated image systems are not too advanced. Therefore, at the end of Spielberg's film there is a dedication: "For Stanley Kubrick".

4- Blade Runner 1982

It is considered a cult movie. It is based on the novel "Do Androids Dream of Mechanical Sheep?" By Philip K. Dick, an author who has inspired countless films including, for example, (based on his book "Ubik"). The case that concerns us today is Blade Runner.

The film bears the signature of Riddley Scott, which in itself is a push to want to see it. The film delves into the consequences of the penetration of technology in a society of a not so distant future. This film is essential in your library of the science fiction genre.

5- EX Machina 2015

We finish with a more recent production. We know the story of Caleb, a programmer who is invited in his company to perform a test with an android that has artificial intelligence.

It is still too early to see what is going to leave this film in moviegoers. The only thing that we can confirm is that it has an Oscar Award for the Best Special Effects and very good reception by the public and critics.

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