ARTIFICIAL INTELLIGENCE

Artificial Intelligence concept appeared in 1956 year, when John McCarthy, professor at Dartmouth College, organized a summer workshop to clarify and develop ideas about *thinking machine*. He chose the name Artificial Intelligence for the project.

AI is acronym and stands for artificial intelligence.

The terms artificial intelligence and robotics are freely used and interchanged. The combination of artificial intelligence and robotics, the convergence of artificial intelligence algorithms and advanced robotic hardware, creates intelligent machines that can perceive, learn, adapt with precision & flexibility. However, the physical nature of a robotic system is different from the pure abstraction of artificial intelligence.

In the world of robotics, collaboration between professionals from different fields of human activity is successful by combining the issues of cognition (perception, awareness and mental models) and the physical attributes (safety, dependability and dexterity)

Much attention is given to the social and medical benefits of robots.

We are experiencing a transition from **Information and Communication Technology ICT** to **InterAction Technology IAT**.

Wireless technology through communication (Bluetooth, Wi-Fi, 5G) and power transfer (wireless charging) will help new generations of robots, free to roam controlled via wireless links, using computing and data storage of the cloud.

The relationship between hardware and software design opens new possibilities, from manufacturing processes to space exploring, with the characteristics:

- Enhancing Robotic Precision and Accuracy
- Adaptability and Autonomous Decision-Making
- Better Workflows and Human-Robot Collaboration
- Boost labour productivity 40% and automate 38% jobs

The artificial intelligence has been explored on many research frontiers, where the most cutting edge - the latest and most advanced stage - discoveries and developments are happening.

The elusive goal of the artificial intelligence is the creation of a machine thinking indistinguishable from a human.

Some of the first insights in the matter are:

– Alfred North Whitehand (1861-1947) English mathematician and philosopher best known for the book Principia Mathematica and the creation of the philosophical school known as Process Philosophy said:

"Civilisation advances by extending the number of important operations we can perform without of thinking about them."

– Alan Turing (1912-1954) English mathematician, computer scientist, logician, cryptanalyst, philosopher, theoretical biologist, considered the father of modern computer science, in the year 1950 suggested that:

"If the human believes the computer is another human than the computer exhibited artificial intelligence. Robotics and artificial intelligence are fundamentally attempts to model various aspects of ourselves. "

– Marvin Lee Minsky (1927-2016) American cognitive scientist and computer researcher, concerned largely with research in artificial intelligence wrote extensively about artificial intelligence and philosophy and in the year 1960 defined:

"Artificial intelligence is the science of making machines do things that would require intelligence if done by men.

Intelligence is some mental processes enable us to solve problems we consider difficult.

Intelligence is our name for which-ever of those processes we don't get understand."

– Stephen William Hawking (1942-2018) English theoretical physicist, cosmologist, author, director of research at Centre for Theoretical cosmology at University of Cambridge said:

"The rise of powerful artificial intelligence will be either the best or the worst thing ever happened to humanity. We don't know which."

The concept of artificial intelligence appeared in 1956 year, two years after the death of Alan Turing, when John McCarthy, professor at Dartmouth College, New Hampshire organized a summer workshop to clarify/develop ideas about *thinking machine* and chose the name Artificial Intelligence for the project. Artificial Intelligence emerged nowadays because there are Large Datasets from Internet and digital technologies.

Especially in the machine learning ML and the deep machine learning DML, having access to vast amounts of data is crucial for training models successfully. The artificial intelligence AI can contain machine learning or not, for example: Human Languages Robots have programs called Large Language Models LLM using specifically deep learning models, trained on massive amounts of text data to understand and generate human language – that is artificial intelligence with machine learning.

Chess Playing Robots have programs using a set of instructions based on the technique called alpha-beta pruning – that is artificial intelligence without machine learning.

Artificial Intelligence is a broader term for virtually any software used in programming of robots performing tasks that typically require human intelligence.

In other formulations, artificial intelligence is a set of technologies that enable computers to perform a variety of advanced functions, including the ability to see, understand and translate spoken and written language, analyse data, make recommendations and so on.

ALAN TURING

Until now the artificial intelligence has outperformed humans on a variety of language understanding and visual understanding benchmarks.
But the foundation models of artificial intelligence still lack advanced reasoning and planning capabilities.
Advanced reasoning and planning capabilities for artificial intelligence are now in development, with companies like OpenAI Inc. and Meta Platforms Inc. giving results integrated into products like Google Search.
However, *achieving human-like reasoning and long-term planning remains a challenge for research.*
Research beyond pattern matching to genuine problem solving and strategic thinking and replicating human-like reasoning is still daring.
Besides, advanced reasoning models imply intensive computing and have higher latency compared to traditional models.

It is remarkable that the concept of artificial intelligence can be found in the ancient literature.
Around the 8th century BCE, the Greek poet Homer wrote in his epic poem 'Iliad' about *Hephaestos*, the god of artisans, blacksmiths, carpenters, craftsmen, fire, metallurgy, metalworking, sculpture and volcanoes who built golden automata, self-operating machines to help him work.
Hephaestos was an able inventor, he built ATTENDANTS for himself with "intelligence in their hearts" and looking as young women, he built AUTONOMOUS VEHICLES that could travel to and from the home of gods and a lethal autonomous weapon system named TALOS that patrolled the beaches of the island Crete.

See further:
The sculpture Vulcan/Hephaestus, Marble, Louvre, reception piece for the French Royal Academy 1742 by artist Guillaume Coustou the Younger (1716-1777)

HEPHAESTUS AT THE FORGE