# ARTIFICIAL INTELLIGENCE

**Author**
**Dr.C.Pramila**
**Assistant Professor**
**School of commerce and International Business**
**Dr.G.R.D College of Science, Coimbatore**

**Co-Author**
**Dr.M.Santhakumar**
**Associate Professor**
**School of commerce and International Business**
**Dr.G.R.D College of Science, Coimbatore**

**Abstract**

Artificial Intelligence is one of the emerging technologies which try to simulate human reasoning in AI systems. John McCarthy invented the term Artificial Intelligence in the year 1950. He said, 'Every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it. An attempt will be made to find how to make machines use language, form abstractions, and concepts, solve kinds of problems now reserved for humans, and improve themselves.' Artificial Intelligence is the ability of a computer program to learn and think. Everything can be considered Artificial intelligence if it involves a program doing something that we would normally think would rely on the intelligence of a human.

**Keywords:** Artificial intelligence, robots, human intelligence, machine language

**Introduction**

Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing, speech recognition and machine vision. As the hype around AI has accelerated, vendors have been scrambling to promote how their products and services use AI. Often what they refer to as AI is simply one component of AI, such as machine learning. AI requires a foundation of specialized hardware and software for writing and training machine learning algorithms. No one programming language is synonymous with AI, but a few, including Python, R and Java, are popular.

## History of AI

The concept of animate objects endowed with intelligence has been around since ancient times. The Greek god Hephaestus was depicted in myths as forging robot-like servants out of gold. Engineers in ancient Egypt built statues of gods animated by priests. Throughout the centuries, thinkers from Aristotle to the 13th century Spanish theologian Ramon Llull to René Descartes and Thomas Bayes used the tools and logic of their times to describe human thought processes as symbols, laying the foundation for AI concepts such as general knowledge representation.

The late 19th and first half of the 20th centuries brought forth the foundational work that would give rise to the modern computer. In 1836, Cambridge University mathematician Charles Babbage and Augusta Ada Byron, Countess of Lovelace, invented the first design for a programmable machine.

**1940s.** Princeton mathematician John Von Neumann conceived the architecture for the stored-program computer -- the idea that a computer's program and the data it processes can be kept in the computer's memory. And Warren McCulloch and Walter Pitts laid the foundation for neural networks.

**1950s.** With the advent of modern computers, scientists could test their ideas about machine intelligence. One method for determining whether a computer has intelligence was devised by the British mathematician and World War II code-breaker Alan Turing. The Turing Test focused on a computer's ability to fool interrogators into believing its responses to their questions were made by a human being.

**1956.** The modern field of artificial intelligence is widely cited as starting this year during a summer conference at Dartmouth College. Sponsored by the Defense Advanced Research Projects Agency (DARPA), the conference was attended by 10 luminaries in the field, including AI pioneers Marvin Minsky, Oliver Selfridge and John McCarthy, who is credited with coining the term *artificial intelligence*. Also in attendance were Allen Newell, a computer scientist, and Herbert A. Simon, an economist, political scientist and cognitive psychologist, who presented their groundbreaking Logic Theorist, a computer program capable of proving certain mathematical theorems and referred to as the first AI program.

**1950s and 1960s.** In the wake of the Dartmouth College conference, leaders in the fledgling field of AI predicted that a man-made intelligence equivalent to the human brain was around the corner, attracting major government and industry support. Indeed, nearly 20 years of well-funded basic research generated significant advances in AI: For example, in the late 1950s, Newell and Simon published the General Problem Solver (GPS) algorithm, which fell short of solving complex problems but laid the foundations for developing more sophisticated cognitive architectures; McCarthy developed Lisp, a language for AI programming that is still used today.

**1970s and 1980s.** But the achievement of artificial general intelligence proved elusive, not imminent, hampered by limitations in computer processing and memory and by the complexity of the problem. Government and corporations backed away from their support of AI research, leading to a fallow period lasting from 1974 to 1980 and known as the first "AI Winter." In the 1980s, research on deep learning techniques and

industry's adoption of Edward Feigenbaum's expert systems sparked a new wave of AI enthusiasm, only to be followed by another collapse of government funding and industry support. The second AI winter lasted until the mid-1990s.

**1990s through today.** Increases in computational power and an explosion of data sparked an AI renaissance in the late 1990s that has continued to present times. The latest focus on AI has given rise to breakthroughs in natural language processing, computer vision, robotics, machine learning, deep learning and more. Moreover, AI is becoming ever more tangible, powering cars, diagnosing disease and cementing its role in popular culture. In 1997, IBM's Deep Blue defeated Russian chess grandmaster Garry Kasparov, becoming the first computer program to beat a world chess champion. Fourteen years later, IBM's Watson captivated the public when it defeated two former champions on the game show Jeopardy. More recently, the historic defeat of 18-time World Go champion Lee Sedol by Google DeepMind's AlphaGo stunned the Go community and marked a major milestone in the development of intelligent machines.

## AI as a service

Because hardware, software and staffing costs for AI can be expensive, many vendors are including AI components in their standard offerings or providing access to artificial intelligence as a service (AIaaS) platforms. AIaaS allows individuals and companies to experiment with AI for various business purposes and sample multiple platforms before making a commitment.

AI programming focuses on three cognitive skills: learning, reasoning and self-correction.

**Learning processes.** This aspect of AI programming focuses on acquiring data and creating rules for how to turn the data into actionable information. The rules, which are called algorithms, provide computing devices with step-by-step instructions for how to complete a specific task.

**Reasoning processes.** This aspect of AI programming focuses on choosing the right algorithm to reach a desired outcome.

**Self-correction processes.** This aspect of AI programming is designed to continually fine-tune algorithms and ensure they provide the most accurate results possible.

## Important of artificial intelligence

AI is important because it can give enterprises insights into their operations that they may not have been aware of previously and because, in some cases, AI can perform tasks better than humans. Particularly when it comes to repetitive, detail-oriented tasks like analyzing large numbers of legal documents to ensure relevant fields are filled in properly, AI tools often complete jobs quickly and with relatively few errors.

This has helped fuel an explosion in efficiency and opened the door to entirely new business opportunities for some larger enterprises. Prior to the current wave of AI, it would have been hard to imagine using computer software to connect riders to taxis, but today Uber has become one of the largest companies in the world by doing just that. It utilizes sophisticated machine learning algorithms to predict when people are

likely to need rides in certain areas, which helps proactively get drivers on the road before they're needed. As another example, Google has become one of the largest players for a range of online services by using machine learning to understand how people use their services and then improving them. In 2017, the company's CEO, Sundar Pichai, pronounced that Google would operate as an "AI first" company.

Today's largest and most successful enterprises have used AI to improve their operations and gain advantage on their competitors.

**Advantages and disadvantages of artificial intelligence**

Artificial neural networks and deep learning artificial intelligence technologies are quickly evolving, primarily because AI processes large amounts of data much faster and makes predictions more accurately than humanly possible.

While the huge volume of data being created on a daily basis would bury a human researcher, AI applications that use machine learning can take that data and quickly turn it into actionable information. As of this writing, the primary disadvantage of using AI is that it is expensive to process the large amounts of data that AI programming requires.

**Advantages**

- Good at detail-oriented jobs
- Reduced time for data-heavy tasks
- Delivers consistent results; and
- AI-powered virtual agents are always available.

**Disadvantages**

- Expensive
- Requires deep technical expertise
- Limited supply of qualified workers to build AI tools
- Only knows what it's been shown; and
- Lack of ability to generalize from one task to another.

**Types of artificial intelligence**

Arend Hintze, an assistant professor of integrative biology and computer science and engineering at Michigan State University, explained in a 2016 article that AI can be categorized into four types, beginning with the task-specific intelligent systems in wide use today and progressing to sentient systems, which do not yet exist. The categories are as follows:

- **Type 1: Reactive machines.** These AI systems have no memory and are task specific. An example is Deep Blue, the IBM chess program that beat Garry Kasparov in the 1990s. Deep Blue can identify pieces on the chessboard and make predictions, but because it has no memory, it cannot use past experiences to inform future ones.

- **Type 2: Limited memory.** These AI systems have memory, so they can use past experiences to inform future decisions. Some of the decision-making functions in self-driving cars are designed this way.

- **Type 3: Theory of mind.** Theory of mind is a psychology term. When applied to AI, it means that the system would have the social intelligence to understand emotions. This type of AI will be able to infer human intentions and predict behavior, a necessary skill for AI systems to become integral members of human teams.

- **Type 4: Self-awareness.** In this category, AI systems have a sense of self, which gives them consciousness. Machines with self-awareness understand their own current state. This type of AI does not yet exist.

## Conclusion

Every new invention or breakthrough will have both, but we as humans need to take care of that and use the positive sides of the invention to create a better world. Artificial intelligence has massive potential advantages. The key for humans will ensure the "**rise of the robots**" doesn't get out of hand. Some people also say that Artificial intelligence can destroy human civilization if it goes into the wrong hands. But still, none of the AI applications made at that scale that can destroy or enslave humanity.

## References

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