

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

DAY – 5

Date: June 27, 2025

Artificial Intelligence

Artificial Intelligence (AI) refers to the technology that allows machines and computers to replicate human intelligence. It enables systems to perform tasks that require human-like decision-making, such as learning from data, identifying patterns, making informed choices and solving complex problems. AI improves continuously by utilizing methods like machine learning and deep learning.

In real-world applications, AI is used in healthcare for diagnosing diseases, finance for fraud detection, e-commerce for personalized recommendations and transportation for self-driving cars. It also powers virtual assistants like Siri and Alexa, chatbots for customer support and manufacturing robots that automate production processes.

The Dawn of Artificial Intelligence (1950s-1960s)

The 1950s, which saw the following advancements, are considered to be the birthplace of AI :

- **1950** : In 1950 saw the publication of Alan Turing's work, "Computing Machinery and Intelligence" which introduced the Turing Test—a measure of computer intelligence.
- **1956**: A significant turning point in AI research occurs in 1956 when, John McCarthy first uses the phrase "Artificial Intelligence" at the Dartmouth Workshop.
- **1950s–1960s**: The goal of early artificial intelligence (AI) research was to encode human knowledge into computer programs through the use of symbolic reasoning, and logic-based environments.
- **Limited Advancement**: Quick advances are hampered by limited resources and computing-capacity.
- **Early AI systems**: This made an effort to encode human knowledge through the use of logic, and symbolic thinking. The development of early artificial intelligence (AI) systems that, depended on symbolic thinking and logic was hampered by a lack of resources, and processing capacity, which caused the field to advance slowly in the beginning.

Types of Artificial Intelligence (AI)

Artificial Intelligence (AI) has transformed industries, leading to significant advancements in technology, science, and everyday life. To understand AI better, we must first recognize that AI can be categorized into different types based on capabilities and functionalities.

1. Narrow AI (Weak AI)

Narrow AI is designed and trained on a specific task or a narrow range tasks. These Narrow AI systems are designed and trained for a purpose. These Narrow systems performs their designated tasks but mainly lack in the ability to generalize tasks.

Examples:

- Voice assistants like Siri or Alexa that understand specific commands.
- Facial recognition software used in security systems.

Despite being highly efficient at specific tasks, Narrow AI lacks the ability to function beyond its predefined scope. These systems do not possess understanding or awareness.

2. General AI (Strong AI)

General AI refers to AI systems that have human intelligence and abilities to perform various tasks. Systems have capability to understand, learn and apply across a wide range of tasks that are similar to how a human can adapt to various tasks.

While General AI remains a theoretical concept, researchers aim to develop AI systems that can perform any intellectual task a human can. It requires the machine to have consciousness, self-awareness, and the ability to make independent decisions, which is not yet achievable.

Potential Applications:

- Robots that can learn new skills and adapt to unforeseen challenges in real-time.
- AI systems that could autonomously diagnose and solve complex medical issues across various specializations.

3. Superintelligence (Super AI)

Super AI surpasses intelligence of human in solving-problem, creativity, and overall abilities. Super AI develops emotions, desires, need and beliefs of their own. They are able to make decisions of their own and solve problem of its own. Such AI would not only be able to complete tasks better than humans but also understand and interpret emotions and respond in a human-like manner.