ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

DAY – 5 **27 June 2025**

What is AI?

AI, or Artificial Intelligence, refers to the simulation of human intelligence in machines. These machines are designed to think, learn, reason, and solve problems—sometimes mimicking how humans think or even going beyond human capabilities in certain tasks.

The Birth of AI (1950s–1960s)

- **1950**: Alan Turing publishes *"Computing Machinery and Intelligence"*, proposing the Turing Test to measure machine intelligence.
- **1950s–60s**: Early AI focused on symbolic reasoning (using logic to mimic human thinking), but progress was slow due to limited computing power.

Progress and Setbacks (1970s–1980s)

- **1970s**: Rise of expert systems—programs that used rules to simulate expert knowledge in specific domains.
- **Limitations**: These systems struggled with complex or unclear situations.
- **AI Winter**: Interest and funding dropped in the late 1970s and 1980s due to unmet expectations.

The Shift to Machine Learning (1990s)

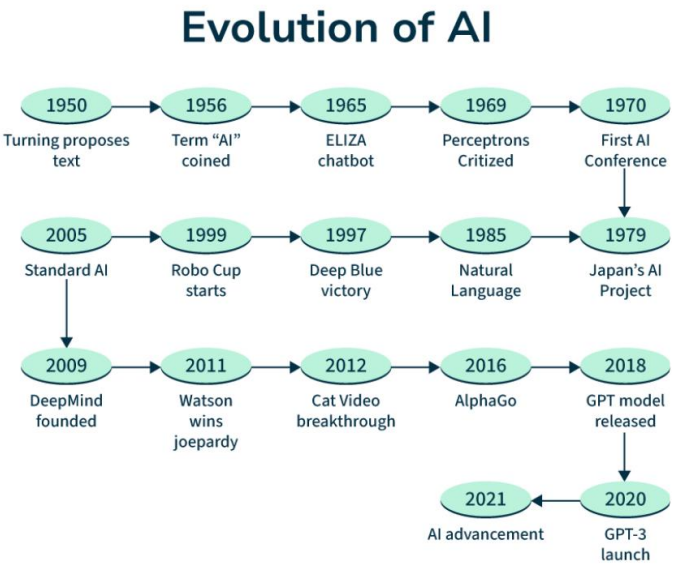
- **1990s**: AI shifted to machine learning, where systems learn patterns from data instead of relying on hard-coded rules.
- Techniques like neural networks, decision trees, and support vector machines gained popularity.
- New areas emerged, like speech recognition, recommendation systems, and natural language processing (NLP).

The Deep Learning Boom (2000s–2010s)

- **Deep Learning**: A form of machine learning inspired by the brain, using multi-layered neural networks.
- Big tech companies (Google, Facebook, OpenAI) invested heavily in AI research.

Generative AI and Transformers (2018–Present)

- **GPT Models**: Developed by OpenAI, models like GPT-3 use massive amounts of text to generate human-like language.
- These models can write essays, poems, answer questions, and translate languages.
- Tools like ChatGPT, Bard, and Bing Copilot showcase AI's ability in writing, creativity, and language understanding.



Narrow AI

Narrow AI, also known as Weak AI, refers to artificial intelligence systems that are designed and trained to perform a specific task or a limited set of tasks. These systems operate within pre-defined boundaries and lack the ability to think or reason beyond their given function. Common examples include voice assistants like Siri and Alexa, recommendation engines like those used by Netflix and Spotify. Although Narrow AI can often perform tasks more efficiently than humans in specific areas, it has no real understanding, self-awareness, or ability to adapt to new or unrelated tasks.

Strong AI

Strong AI, also known as Artificial General Intelligence (AGI), is a theoretical form of AI that would have the ability to understand, learn, and apply intelligence across a wide range of domains, just like a human being. Strong AI would be capable of reasoning, problem-solving, adapting to new situations, and even exhibiting traits like self-awareness and consciousness. Unlike Narrow AI, Strong AI could transfer knowledge from one area to another and perform complex tasks without being specifically programmed for each.