

Artificial Intelligence

Dr Venus Dillu

Department of Physics, SoVSAS

GBU



The Term Artificial Intelligence



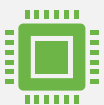
The **term** artificial intelligence was **first coined** by **John McCarthy in 1956** when he held the first academic conference on the subject.



But **the journey** to understand if **machines can truly think** began much **before** that.



In **1945, Vannevar Bush's** essay "As We May Think" he proposed a system which amplifies people's own knowledge and understanding.



Five years later in **1950 Alan Turing** wrote a paper on the notion of **machines being able to simulate human beings** and the ability to do intelligent things, such as play Chess.

Few Definitions of AI



John McCarthy (1955-56) defines AI as:

"the science and engineering of making intelligent machines."

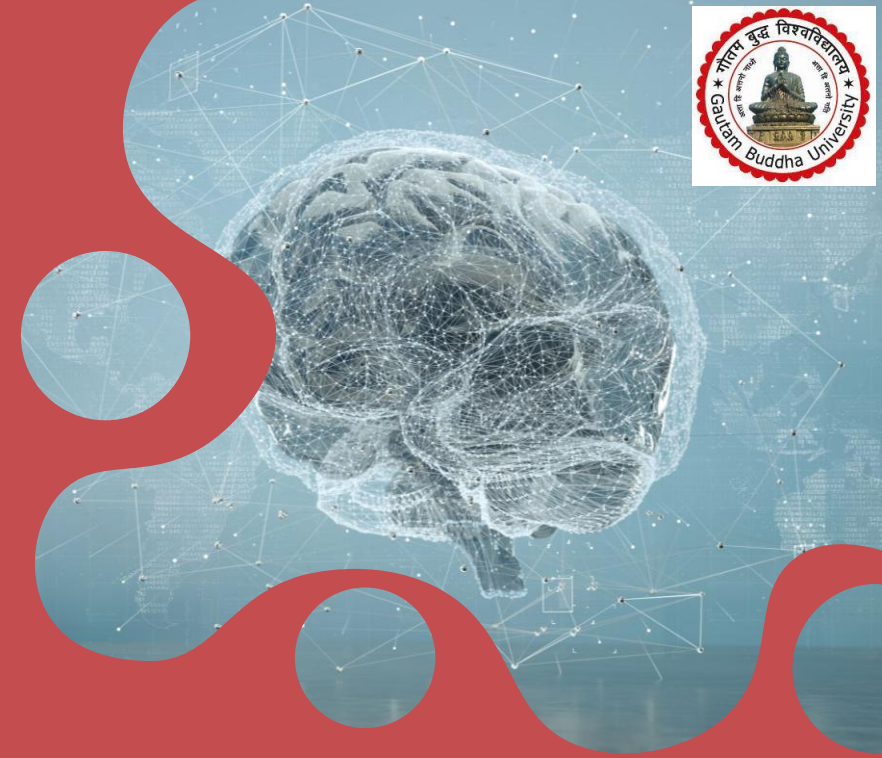
B J Copeland,
Professor and Director of Turing Archive,
says AI is:

the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings

**AI involves
creating systems
that can exhibit
some form of
intelligence or
rationality in their
behavior.**

Artificial Intelligence

Artificial intelligence (AI) is a broad and interdisciplinary field that **aims to create machines or systems** that can **perform tasks** that normally **require human intelligence**, such as **reasoning, learning, perception, decision making, or problem solving.**



What is AI

Artificial intelligence, or AI,
is technology that

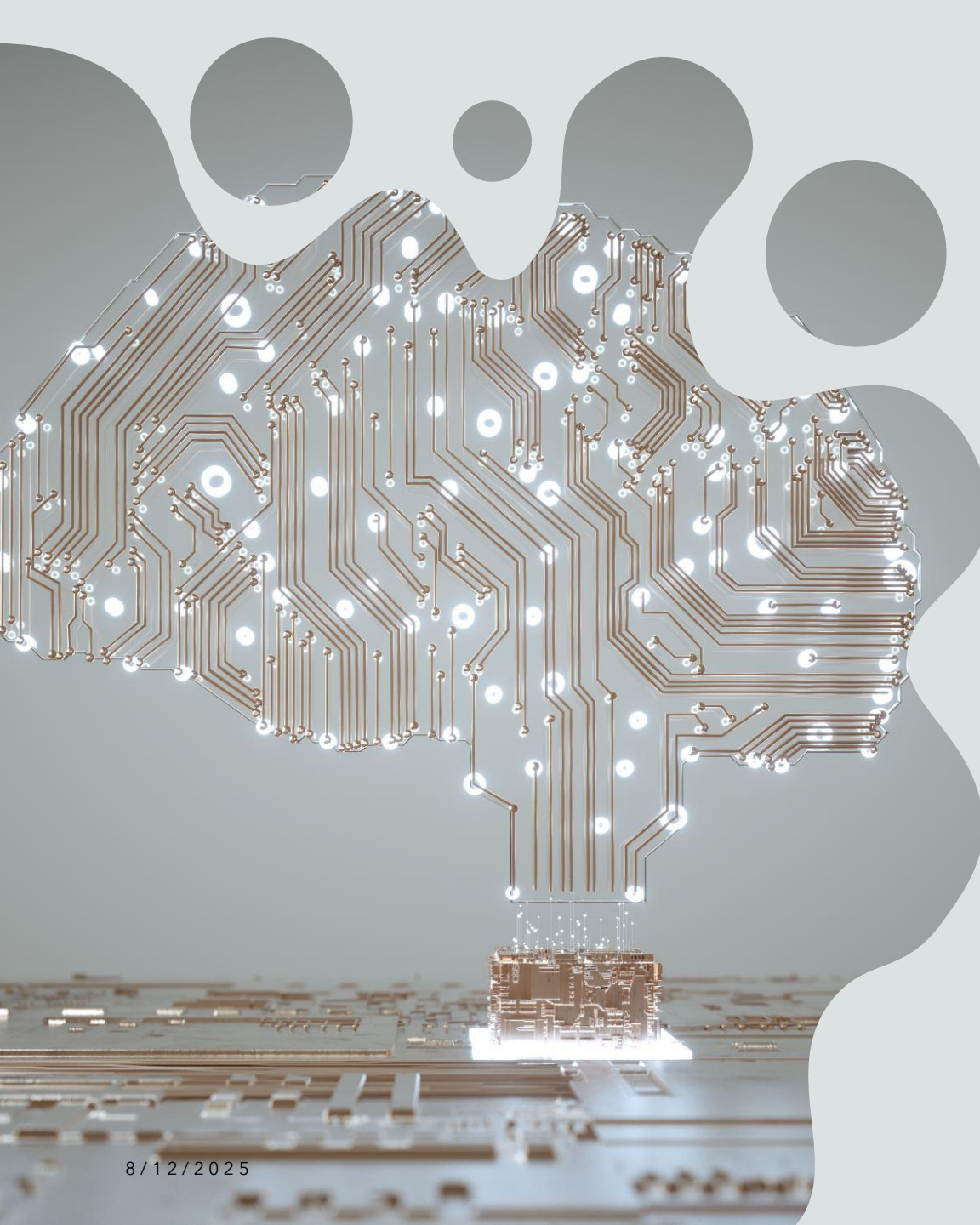
**enables computers and
machines**

to

emulate human intelligence

and

problem-solving capabilities.



AI



Artificial Intelligence (AI) is a branch of computer science that focuses on **creating intelligent agents**,



which are **systems** that can **perceive** their **environment**, **learn**, **reason**, and **take actions to achieve goals**.



Essentially, it's about **building machines** that can **think and learn like humans**.

Capabilities

On its own or combined with other technologies

e.g., **sensors, geolocation, robotics**

AI can **perform tasks** that would otherwise require **human intelligence or intervention.**

Few Examples



**DIGITAL
ASSISTANTS**



GPS GUIDANCE



**AUTONOMOUS
VEHICLES**



**GENERATIVE AI
TOOLS
(LIKE OPEN AI'S
CHAT GPT)**

AI: ML and DL



As a field of computer science, artificial intelligence encompasses (and is often mentioned together with):



Machine Learning (ML)



Deep Learning (DL)

What works for AI ???

These disciplines involve the
development of AI algorithms,
modeled after the **decision-making processes** of the
human brain,
that can **'learn'** from **available data** and
make increasingly **more accurate classifications**
or **predictions** over time.

Core concepts of AI

Machine
Learning

Deep
Learning

Natural
Language
Processing

Computer
Vision

Robotics

Machine Learning: This is a subset of AI that allows systems to learn from data without being explicitly programmed.

Deep Learning: A specialized form of machine learning that uses artificial neural networks to analyze data with a structure similar to the human brain.

Natural Language Processing (NLP): This enables computers to understand, interpret, and generate human language.

Computer Vision: This gives machines the ability to interpret and understand visual information from the world.

Robotics: This combines AI with mechanical engineering to create intelligent robots.

The turning point: ChatGPT !!!

(Generative Pre-trained Transformer)

Generative AI can

learn and **synthesize not just human language**
but other data types including
images, video, software code,
and
even molecular structures.



Natural Language Processing (NLP) & Generative Pre-trained Transformer (GPT)

NLP and GPT

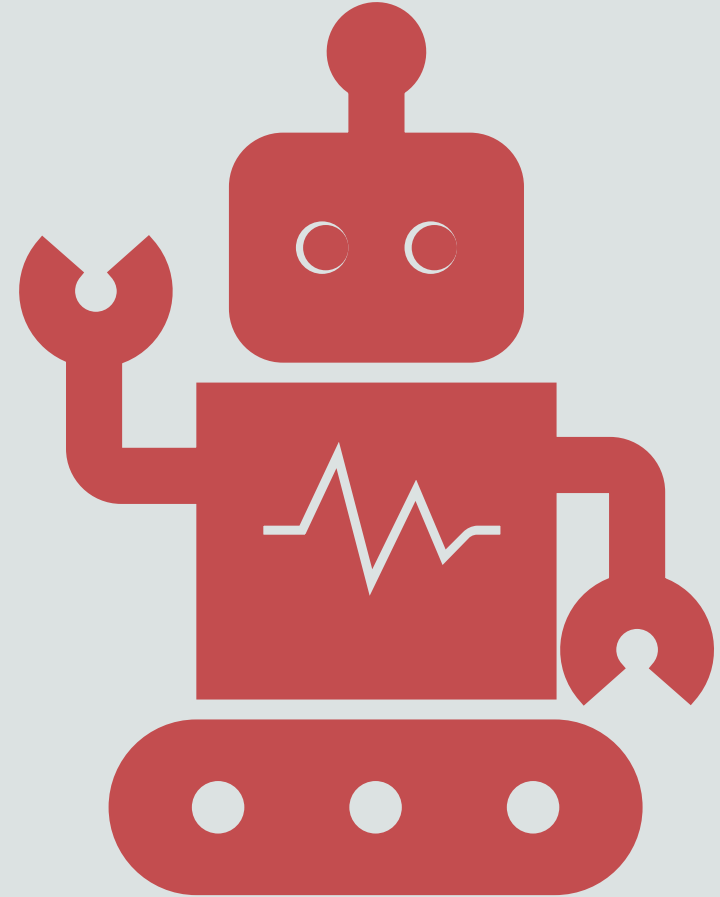


Natural language processing (NLP) is the **broad field** that studies **how human languages and computers interact**, involving a variety of approaches and strategies.



GPT is a **particular model architecture** in **NLP** that has drawn notice for **its exceptional powers** in **comprehending** and **producing natural language**

How does AI work?



Steps showing How AI Works...



Data Collection: Gathering relevant data for the AI to learn from.



Data Preparation: Cleaning and organizing data into a suitable format.



Model Building: Creating an AI model that can learn patterns from the data.



Model Training: Feeding the model with data to learn and improve its performance.

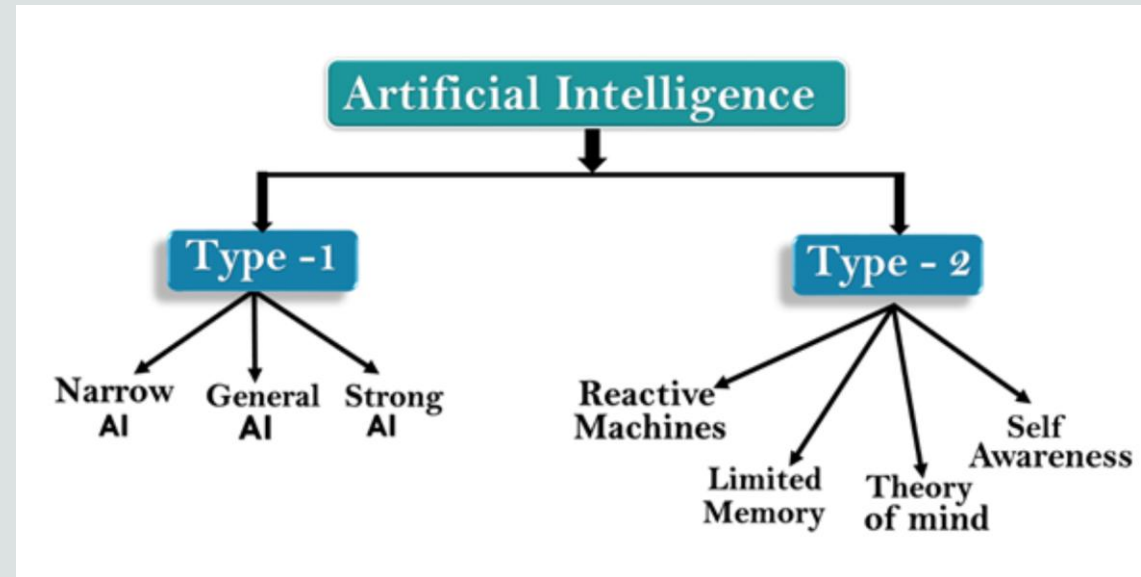


Model Evaluation: Assessing the model's accuracy and effectiveness.



Deployment: Integrating the model into applications or systems.

Types of AI



Type I: Based on **Capabilities**.



Type II: Based on **Functionalities**.



Types of AI

Narrow AI: AI designed to complete **very specific actions**; unable to independently learn.

General AI: AI designed to **learn, think** and **perform** at **similar** levels to **humans**.

Strong/Super AI: AI able to **surpass** the **knowledge** and **capabilities of humans**.

Reactive Machine AI: AI capable of **responding to external stimuli in real time**; **unable** to **build memory** or store information for future.

Limited Memory AI: AI that can **store knowledge** and **use it to learn** and **train** for **future** tasks.

Theory of Mind AI: AI that **can sense** and **respond** to **human emotions**, plus perform the tasks of limited memory machines.

Self-Aware AI: AI that can **recognize others' emotions**, plus has sense of self and human-level intelligence; **the final stage of AI**.

Applications of AI



Risk and Challenges of AI



Data privacy



Dependence on AI



Regulatory compliance



Job displacement



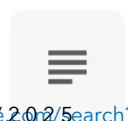
Existential risks



Legal liability



AI arms race



Misinformation and mani...



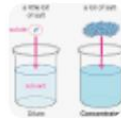
Bias and discrimination



Bias



Unintended consequences



Concentration of power



Autonomous weapons



Artificial intelligence syst...



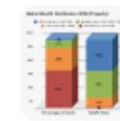
Biased algorithms



AI transparency



Security



Economic inequality



Ethical dilemmas



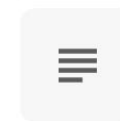
Data breaches



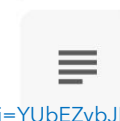
Job automation



Lack of transparency



Loss of human connection



Artificial superintelligence



Frequently asked questions about AI

Is AI dangerous?

Can AI cause human extinction?









What happens if AI becomes self-aware?

Is AI a threat to the future?



Ethics regarding AI



Press Corner Data Center Quick Links  English 
Expertise  Impact  Publications  Watch & Listen  Get Involved  

Artificial Intelligence

Artificial Intelligence

Home Ethics of AI AI in Education AI & inclusion  Digital Capacity Building  Resources 

Ethics of Artificial Intelligence

The Recommendation

Global AI Ethics and Governance Observatory

Getting AI governance right is one of the most consequential challenges of our time, calling for mutual learning based on the lessons and good practices emerging from the different jurisdictions around the world.

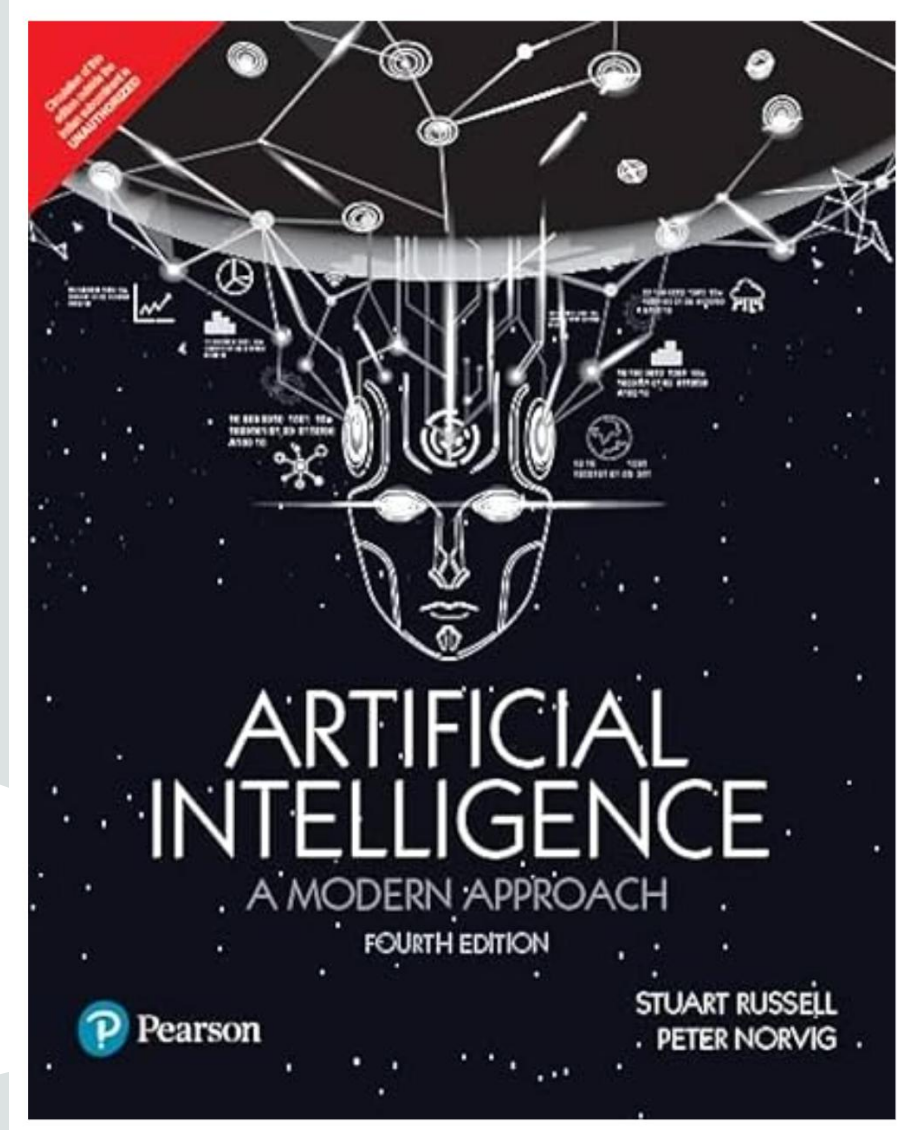
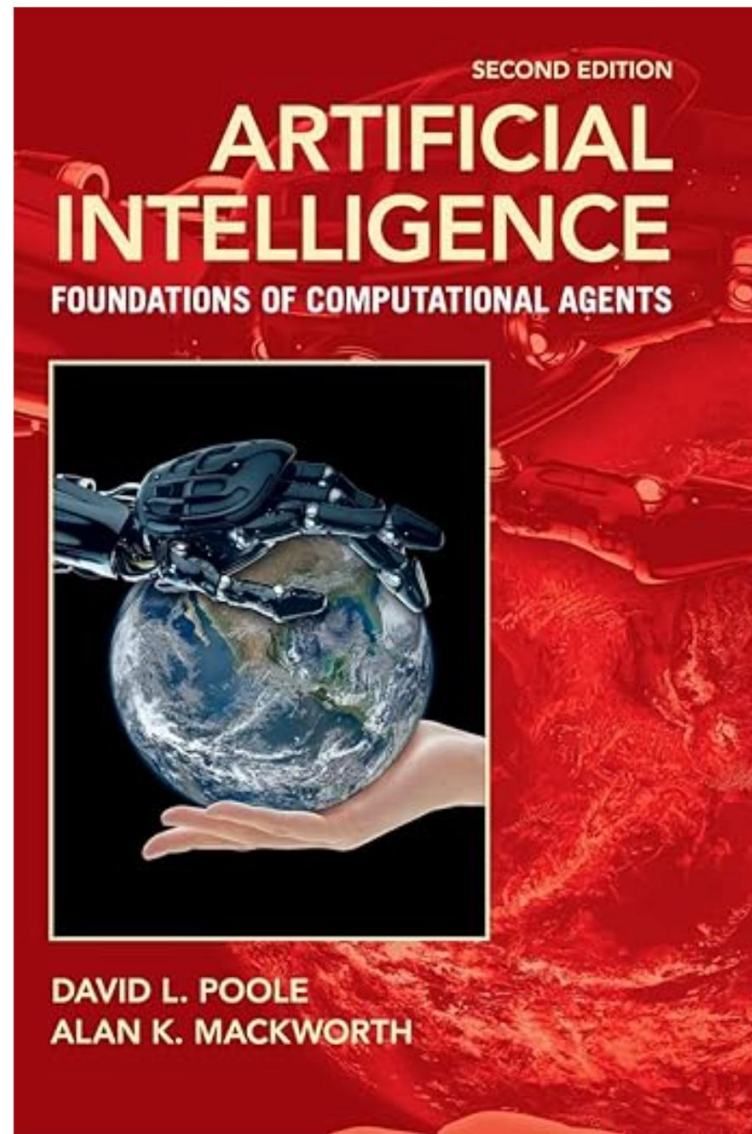
The aim of the **Global AI Ethics and Governance Observatory** is to provide a global resource for policymakers, regulators, academics, the private sector and civil society to find solutions to the most pressing challenges posed by Artificial Intelligence.

The Observatory showcases information about the readiness of countries to adopt AI ethically and responsibly.

It also hosts the AI Ethics and Governance Lab, which gathers contributions, impactful research, toolkits and good practices.

Discover →

Books





Thank You!