

Artificial Intelligence

- The branch of Computer Science which deals with simulation of intelligence in machines

Simulation : Imitation of Process or situation

Intelligence: the ability to acquire and apply knowledge and skills.

Artificial : made or produced by human beings rather than occurring naturally, a copy of something natural.



Artificial Intelligence

- The ability of a computer or a robot controlled by a computer to do tasks that are usually done by humans
- such as
 - the ability to reason,
 - discover meaning,
 - generalize, or learn from past experience.



History of Artificial Intelligence

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Artificial Intelligence

John McCarthy defines

"It is the science and engineering of making intelligent machines, especially intelligent computer programs.

It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable."



History of Artificial Intelligence

- 1950: Alan Turing publishes *Computing Machinery and Intelligence*.
 - In the paper, Turing—famous for breaking the Nazi's ENIGMA code during WWII—proposes to answer the question '**can machines think?**' and
 - introduces the **Turing Test** to determine if a computer can demonstrate the same intelligence (or the results of the same intelligence) as a human.



History of Artificial Intelligence

- 1956: John McCarthy coins the term '**artificial intelligence**' at the first-ever AI conference at Dartmouth College.
- Later that year, Allen Newell, J.C. Shaw, and Herbert Simon create the **Logic Theorist**, the first-ever running AI software program.



Types of Artificial Intelligence

AI types based on capabilities are:

- **Artificial narrow intelligence (ANI)**
 - designed to perform a single task or a set of related activities.
 - For instance, analyzing images, searching through large chunks of information to find some insights, speech recognition, or providing recommendations.
 - Almost all AI-systems, as of today, can be classified under this type.
 - Apple's Siri virtual assistant or Netflix video recommendations are good examples of ANI.



Types of Artificial Intelligence

- **Artificial general intelligence (AGI)**
 - a level of AI that can perform intellectual and creative tasks with human-like capabilities.
 - It is supposed to make informed decisions based on previous experience and knowledge in related areas.
 - Although there have been some attempts, this type of AI has not yet been fully developed.
- **Artificial superintelligence (ASI)**
 - meant to surpass human abilities in analytical thinking, creativity, and performance of completing tasks.
 - still a long way from implementing these types of computer systems



Artificial Intelligence Applications

There are numerous, real-world applications

Speech Recognition:

- also known as automatic speech recognition (ASR), computer speech recognition, or speech-to-text,
- it is a capability which uses natural language processing (NLP) to process human speech into a written format.
- Many mobile devices incorporate speech recognition into their systems to conduct voice search—e.g. Siri—OkGoogle - or provide more accessibility around texting.



Artificial Intelligence Applications

- Customer Service:
 - Online chatbots are replacing human agents along the customer journey.
 - They answer frequently asked questions (FAQs) around topics, like shipping, or provide personalized advice, cross-selling products or suggesting sizes for users,
 - messaging apps, such as Slack and Facebook Messenger, and tasks usually done by virtual assistants and voice assistants.



Artificial Intelligence Applications

- Computer Vision:

- enables computers and systems to derive meaningful information from digital images, videos and other visual inputs, and based on those inputs, it can take action.
- has applications within photo tagging in social media, radiology imaging in healthcare, and self-driving cars within the automotive industry.



Artificial Intelligence Applications

- **Recommendation Engines:**
 - Using past consumption behavior data, used to make relevant add-on recommendations to customers during the checkout process for online retailers.
- **Automated stock trading:**
 - AI-driven high-frequency trading platforms make thousands or even millions of trades per day without human intervention.
- Manufacturing Robots
- Virtual personal assistants



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Advantages of Artificial Intelligence

- Reduction in Human Error
- Takes risks instead of Humans
- Available 24x7
- Helping in Repetitive Jobs
- Faster Decisions
- Daily Applications (okgoogle, siri)



Disadvantages of Artificial Intelligence

- High Costs of Creation
- Making Humans Lazy
- Unemployment

Meaning and Nature of Industry 4.0,
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emerging technologies in global busin...

Industry 4.0

(Meaning and Nature)



Overview of Digital Transformation,
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Digital Transformation

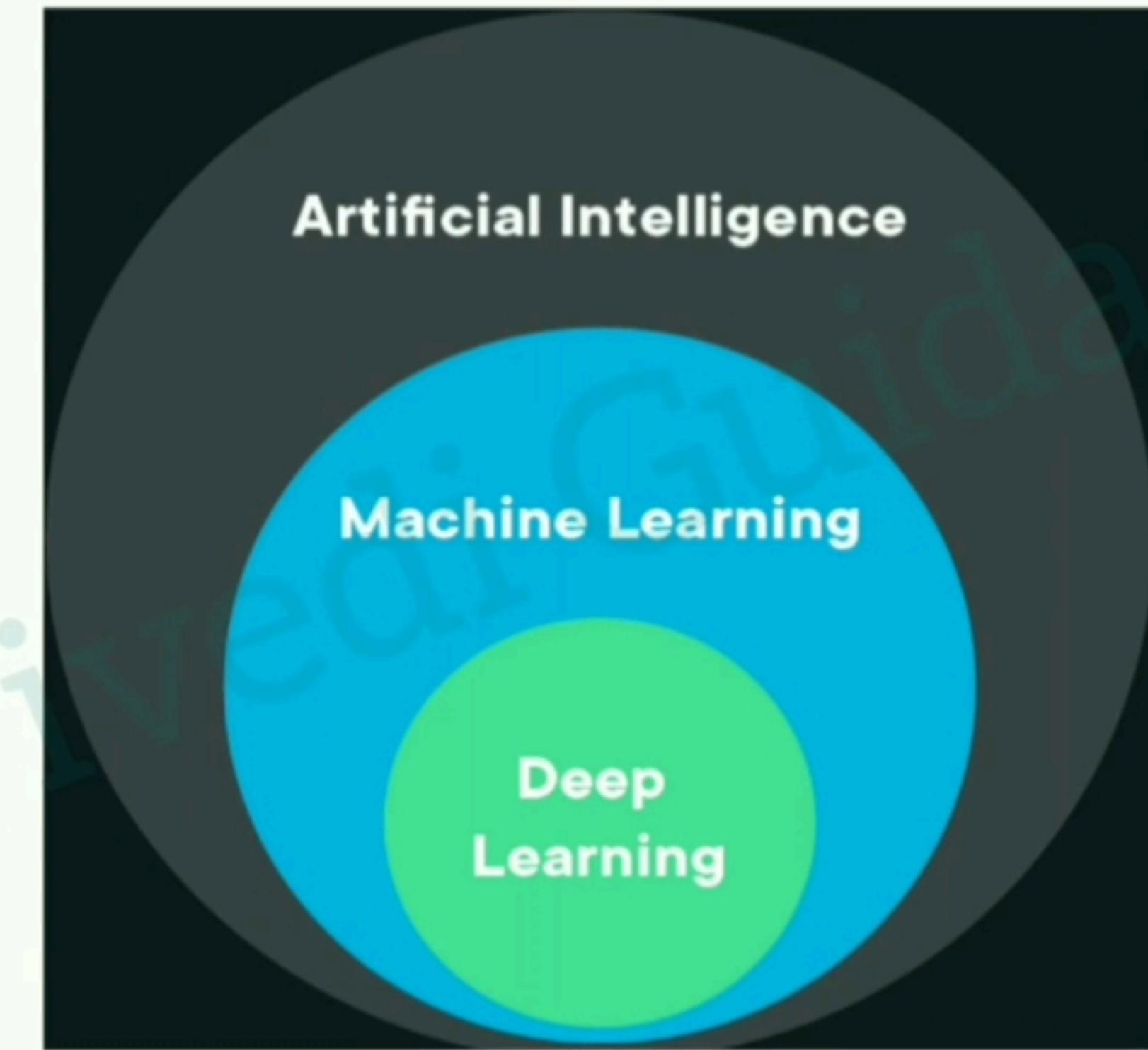
(Overview- Meaning Definition, Example, Strategy, Benefits)

Disadvantages of Artificial Intelligence

- High Costs of Creation
- Making Humans Lazy
- Unemployment
- No Emotions

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Artificial Intelligence



Machine Learning

- a branch of artificial intelligence (AI) and computer science which focuses on the use of data and algorithms to imitate the way that humans learn,
- Gives computers the capability to learn without explicitly programmed
- Provide statistical tools to explore and analyse the data



Machine Learning

- Type :
 - Supervised (Labeled data),
 - UnSupervised (Unlabeled Data) and
 - Reinforcement Learning (Reward Learning)



Machine Learning

- **Supervised Machine Learning**
 - use of labeled datasets to train algorithms that to classify data or predict outcomes accurately.



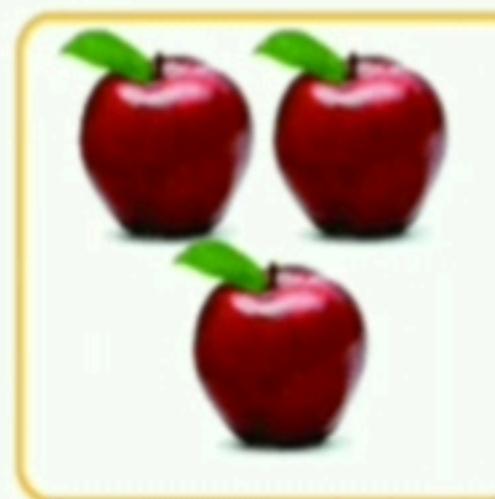
Machine Learning



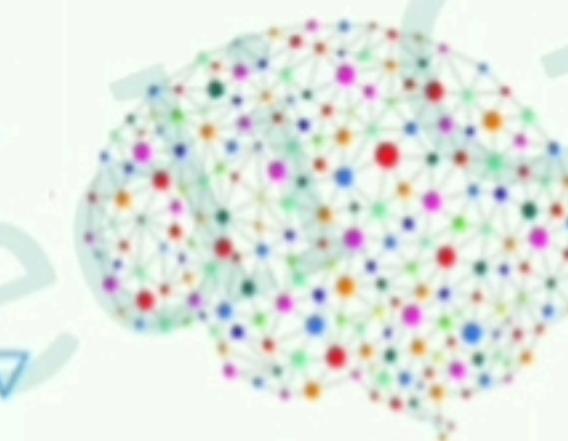
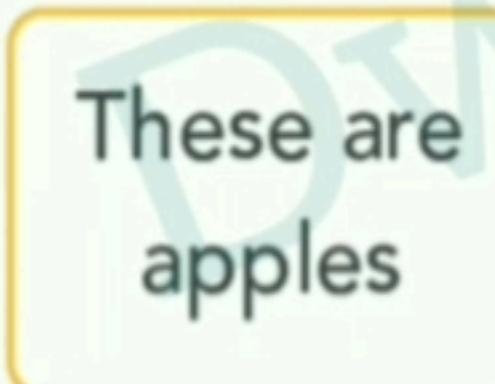
Artificial Intelligence, AI



Input data



Annotations



Model



Prediction

Its an
apple!



Machine Learning

- Unsupervised Machine Learning
 - uses machine learning algorithms to analyze and cluster unlabeled datasets.

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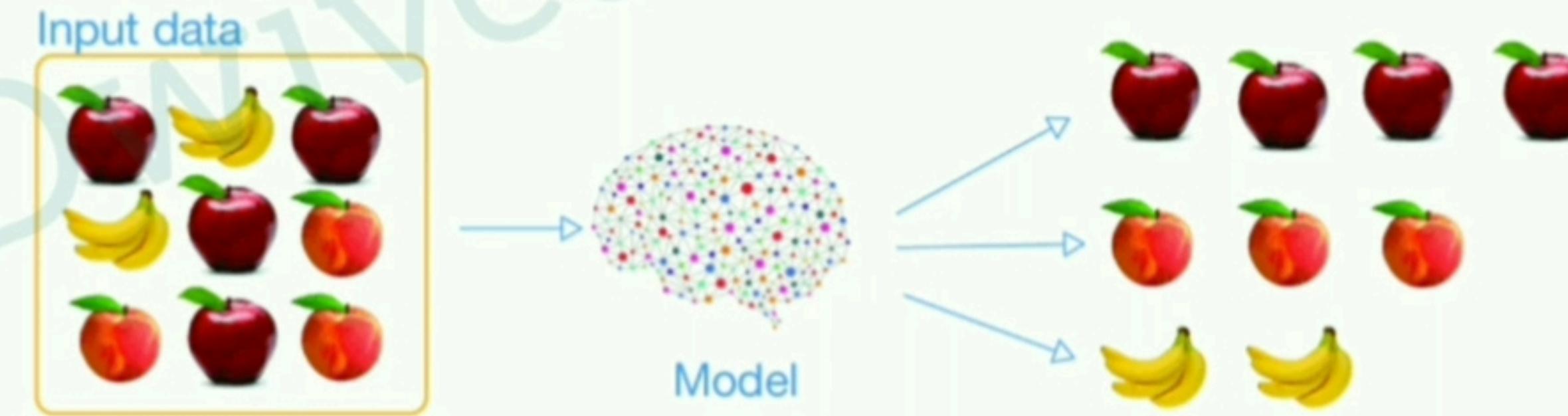
Machine Learning

- Unsupervised Machine Learning
 - uses machine learning algorithms to analyze and cluster unlabeled datasets.
 - These algorithms discover hidden patterns or data groupings without the need for human intervention.

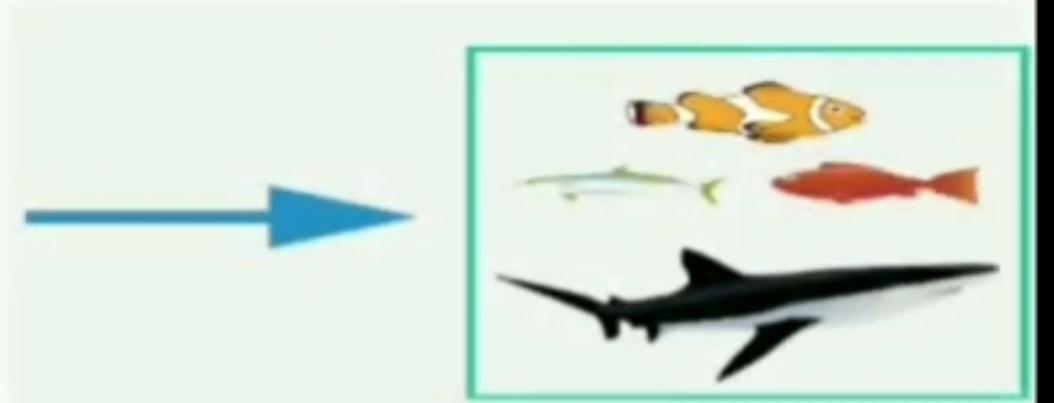
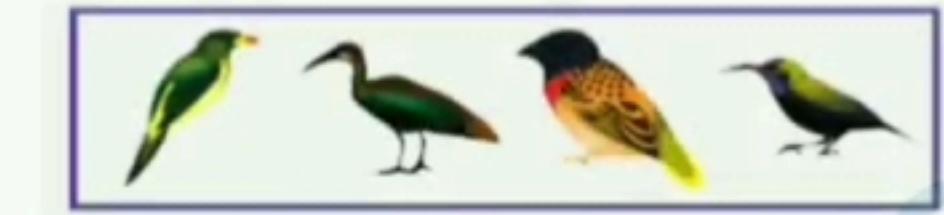


Machine Learning

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Machine Learning

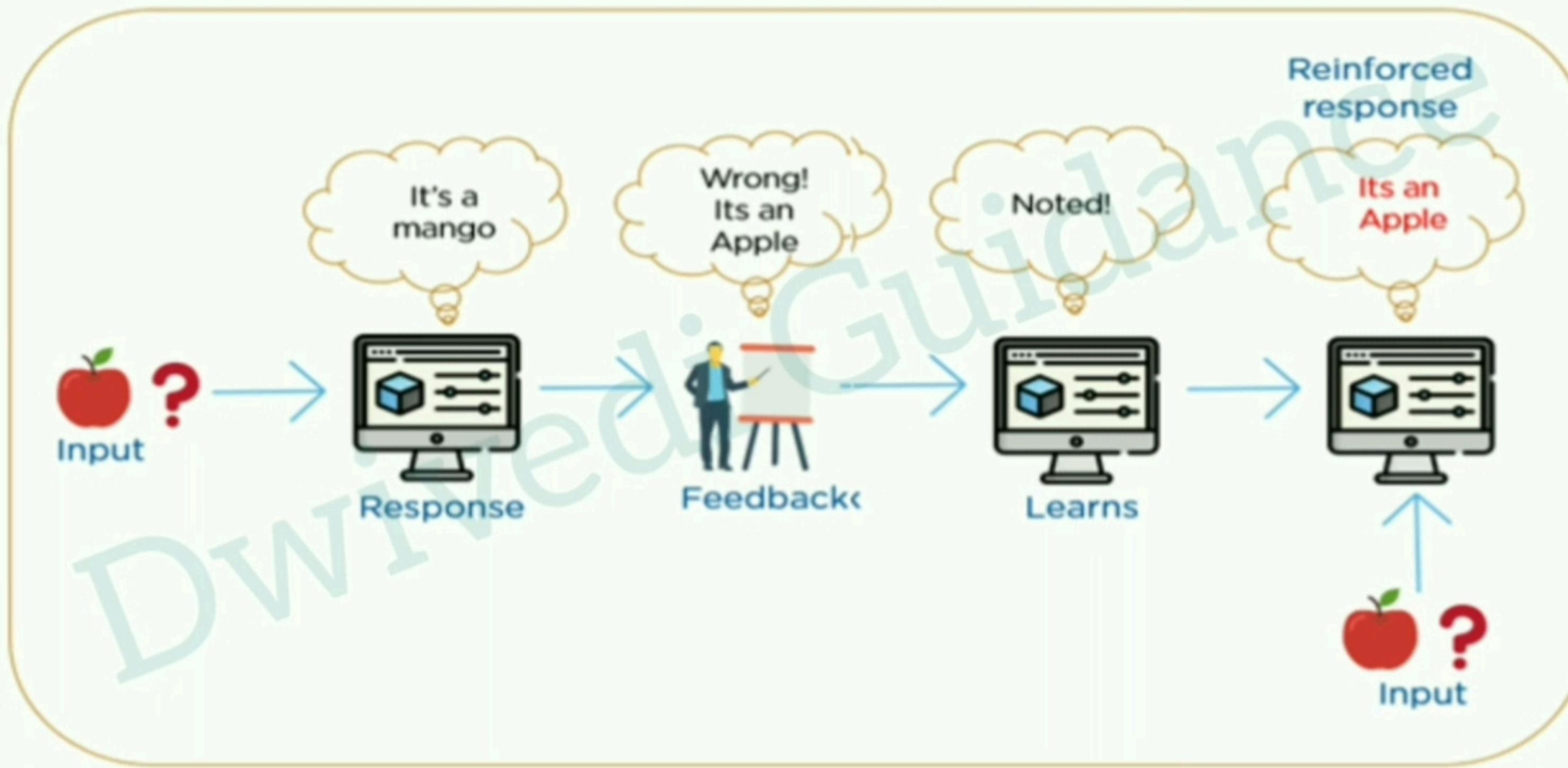


Machine Learning

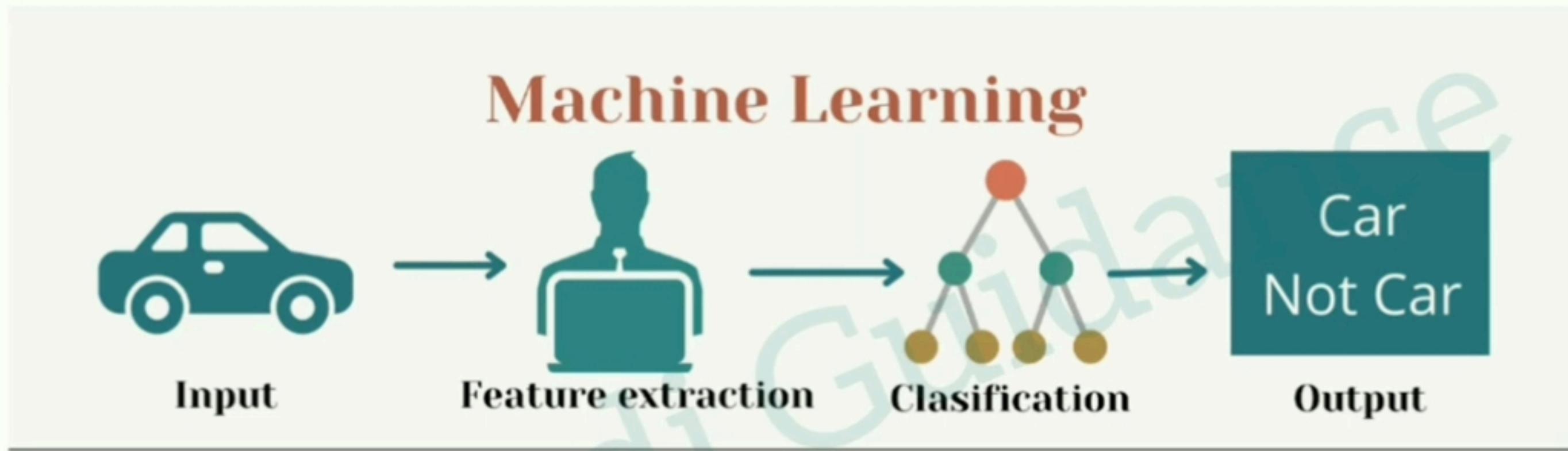
- Reinforcement Machine Learning
 - A sequence of successful outcomes will be reinforced to develop the best recommendation or policy for a given problem.
 - Learn from mistakes or feedbacks



Machine Learning



Deep Learning



Deep Learning

Machine Learning

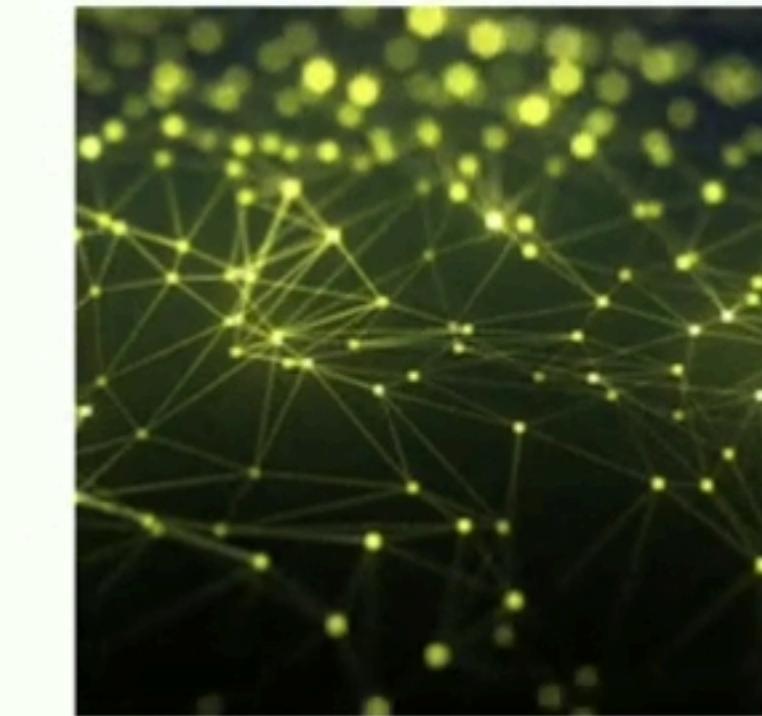


Deep Learning



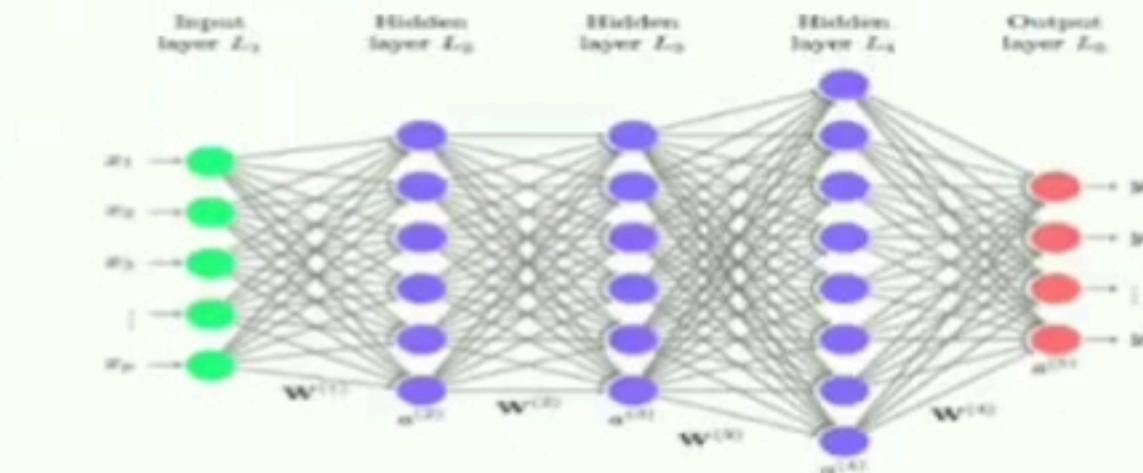
Deep Learning

- is a type of machine learning
- Works on Unstructured data
- Inspired by the structure of human brains
- In terms of deep learning, it is called Artificial Neural Networks



Deep Learning

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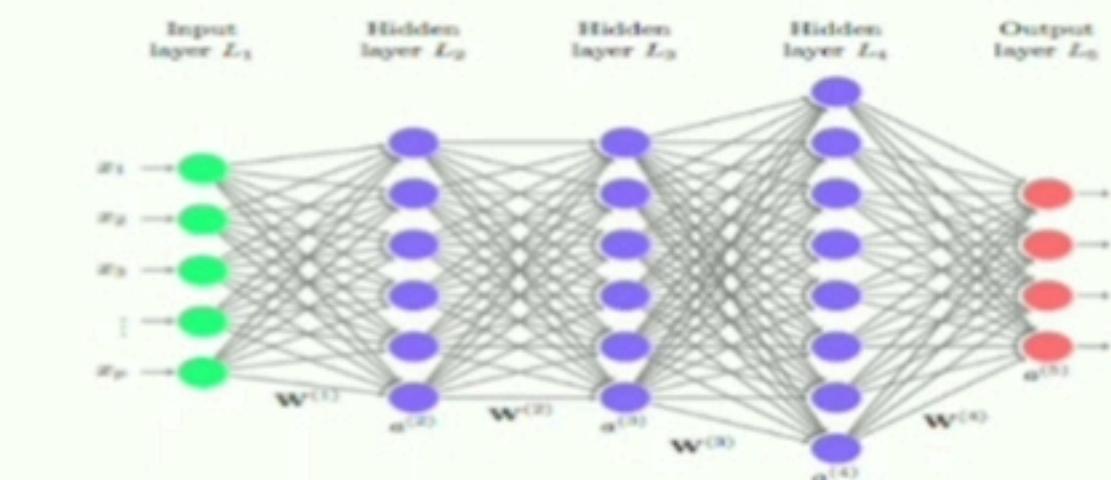
Deep Learning

- is a type of machine learning
- Works on Unstructured data
- Inspired by the structure of human brains
- In terms of deep learning, it is called Artificial Neural Networks
- Used to handle huge amount of data, complex problems and Features Extraction



Deep Learning

- Deep learning neural networks, or artificial neural networks, attempts to mimic the human brain
- Consist of multiple layers of interconnected nodes, each building upon the previous layer to refine and optimize the prediction or categorization.
- These elements work together to accurately recognize, classify, and describe objects within the data.



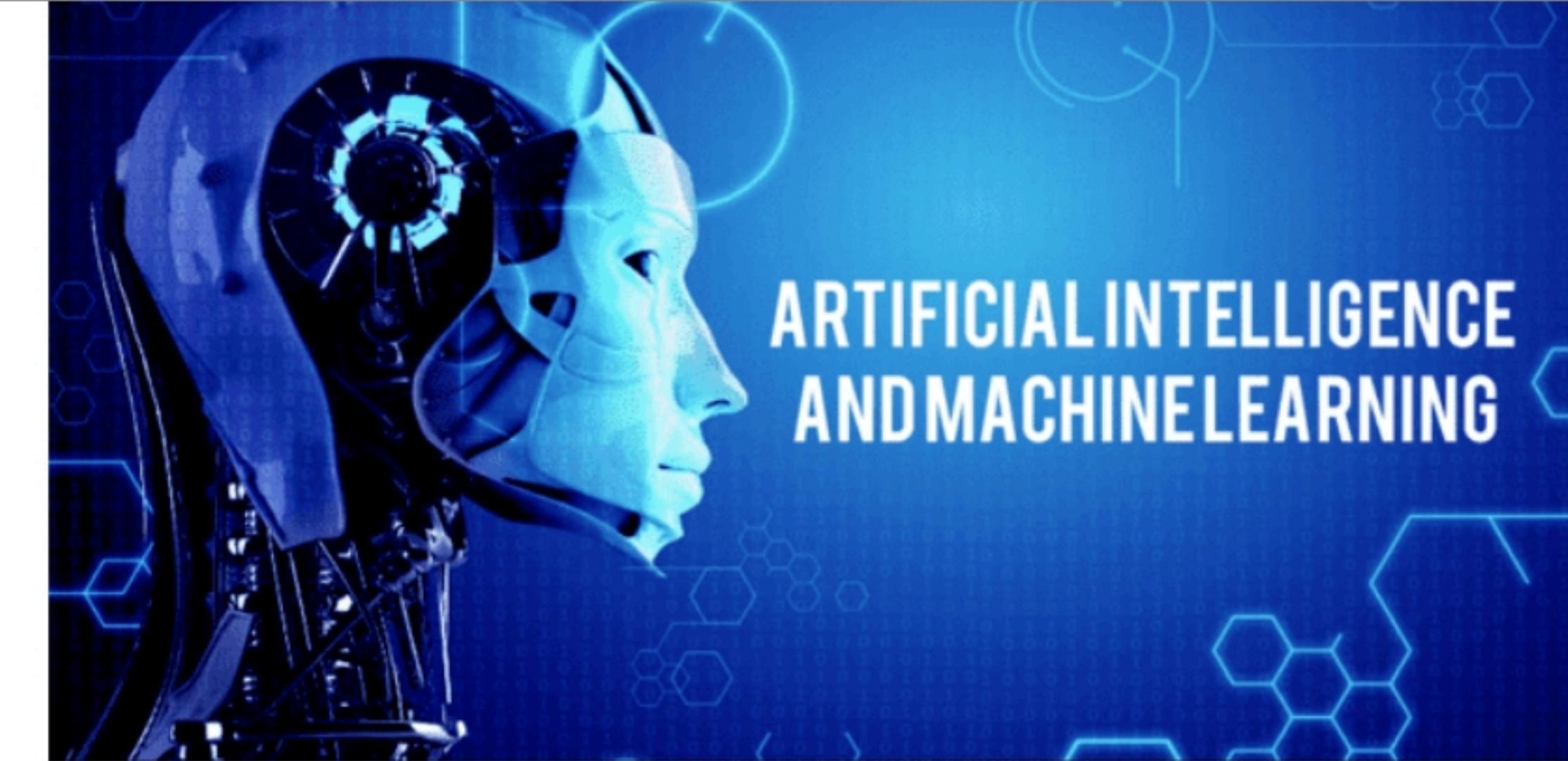
Deep Learning

Used in

- Customer support,
- Self Driving Cars,
- MRI Image Readings

- Artificial intelligence and machine learning are the part of computer science that are correlated with each other

- These two technologies are the most trending technologies which are used for creating intelligent systems.



AI is a bigger concept to create intelligent machines that can simulate human thinking capability and behavior, whereas, machine learning is an application or subset of AI that allows machines to learn from data without being programmed explicitly.

Artificial Intelligence

- Artificial intelligence is a field of computer science which makes a computer system that can mimic human intelligence
- It is comprised of two words "**Artificial**" and "**intelligence**", which means "a human-made thinking power"
- The Artificial intelligence system does not require to be pre-programmed, instead of that, they use such algorithms which can work with their own intelligence
- It involves machine learning algorithms such as Reinforcement learning algorithm and deep learning neural networks
- AI is being used in multiple places such as Siri, Google's AlphaGo, AI in Chess playing, etc.



- **Machine learning:** *Machine learning is a subfield of artificial intelligence, which enables machines to learn from past data or experiences without being explicitly programmed*
- Machine learning enables a computer system to make predictions or take some decisions using historical data without being explicitly programmed
- Machine learning uses a massive amount of structured and semi-structured data so that a machine learning model can generate accurate result or give predictions based on that data
- Machine learning works on algorithm which learn by its own using historical data
- Machine learning is being used in various places such as for online recommender system, for Google search algorithms, Email spam filter, Facebook Auto friend tagging suggestion, etc.