

MACHINE LEARNING



What is a simple definition of machine learning?

Machine learning definitions

Machine learning makes computers more intelligent without explicitly teaching them how to behave. "At its heart, machine learning is the task of making computers more intelligent without explicitly teaching them how to behave.

Machine learning defined. Machine learning is a subset of artificial intelligence that enables a system to autonomously learn and improve using neural networks and deep learning, without being explicitly programmed, by feeding it large amounts of data.

Why do we need ML?

Machine Learning (ML) is crucial due to its ability to handle large, complex datasets, automate tasks, and drive innovation across various fields. It enables businesses to make data-driven decisions, improve efficiency, and gain a competitive edge. ML also plays a vital role in developing advanced technologies like autonomous vehicles, chatbots, and personalized recommendations.

Types of Machine Learning

There are several types of machine learning, each with special characteristics and applications. Some of the main types of machine learning algorithms are as follows:

1. Supervised Machine Learning
2. Unsupervised Machine Learning
3. Reinforcement Learning



Supervised Learning:

Uses labeled data where the correct output is known, allowing the model to learn from examples and predict new outputs.

Examples include classification (predicting categories) and regression (predicting continuous values).

Regression models predict continuous values, while classification models assign data points to predefined categories.

Unsupervised Learning:

Uses unlabeled data, allowing the model to discover patterns and structures without explicit guidance.

Examples include clustering (grouping similar data points) and association rule mining (finding relationships between items).

Clustering groups similar data points into clusters, while association rule mining reveals patterns and relationships between items.

Reinforcement Learning:

Uses an agent that learns by interacting with an environment, receiving rewards or penalties for its actions. The agent learns to optimize its actions to maximize cumulative reward, without explicit labels for each action. Common applications include game playing, robotics, and resource management.

AI AND ML



AI And ML ?

Machine learning significantly enhances artificial intelligence by enabling AI systems to learn and improve from data without explicit programming. It allows AI to analyze data, identify patterns, and make predictions or decisions based on those findings.

How are AI and ML connected?

While AI and ML are not quite the same thing, they are closely connected.

The simplest way to understand how AI and ML relate to each other is:

1. AI is the broader concept of enabling a machine or system to sense, reason, act, or adapt like a human
2. ML is an application of AI that allows machines to extract knowledge from data and learn from it autonomously.

Differences between AI and ML

Now that you understand how they are connected, what is the main difference between AI and ML?

While artificial intelligence encompasses the idea of a machine that can mimic human intelligence, machine learning does not. Machine learning aims to teach a machine how to perform a specific task and provide accurate results by identifying patterns.



Artificial intelligence

1. AI allows a machine to simulate human intelligence to solve problems
2. The goal is to develop an intelligent system that can perform complex tasks
3. We build systems that can solve complex tasks like a human
4. AI has a wide scope of applications
5. AI uses technologies in a system so that it mimics human decision-making
6. AI works with all types of data: structured, semi-structured, and unstructured
7. AI systems use logic and decision trees to learn, reason, and self-correct

Machine learning

1. ML allows a machine to learn autonomously from past data
2. The goal is to build machines that can learn from data to increase the accuracy of the output
3. We train machines with data to perform specific tasks and deliver accurate results
4. Machine learning has a limited scope of applications
5. ML uses self-learning algorithms to produce predictive models
6. ML can only use structured and semi-structured data
7. ML systems rely on statistical models to learn and can self-correct when provided with new data