Artificial Intelligence & Machine Learning

Overview

AI and machine learning are two closely related domains that have added a revolutionary effect to the technology. AI is a technique that is used to build systems and machines that can mimic human behavior and neural networks, while machine learning is a subset of AI that involves training models using data in order to solve tasks. These machine learning models solve tasks based on the information and massive data provided to them, and this information is derived using probability theory and linear algebra. We use machine learning algorithms on our data to solve tasks, and these machines are built in such a way that they learn from their own actions and improve future outcomes.

Also, there are a few forms of machine learning, **namely supervised learning, unsupervised learning,** and **reinforcement learning**. Additionally, **deep learning** is also a branch of machine learning that mimics the brain as closely as possible.

Prominent products and services

AI and machine learning-related products are used in many industries, including gaming, data, automotive, finance, the Internet of Things, bioscience, healthcare, and many more. So among the many AI products, the most prominent and common products and services are as follows:

- Speech recognition

  AI technology is now capable of providing natural-sounding speech models with real human intelligence using natural language processing and machine learning. One of the most prominent products is voice assistants which have been used widely, such as Amazon Alexa, Apple Siri, Google Assistant, Microsoft Cortna, etc.
- Chatbots

  These are computer programs that also use natural language processing and machine learning and can interact with users through an interface. Chatbots are used in a wide range of applications, from customer service support to personal assistants and productivity tools.
- Mobile apps and smartphones
- Image recognition
- Automation

  Often used in e-commerce and by companies such as Microsoft, Apple, and IBM to improve their background processes and workflows, which traditionally require human

intervention. Some examples can be given as Robotic Process Automation(RPA), Supply Chain Automation, and Customer service.

Known software solutions using Artificial Intelligence and Machine Learning and their use cases.

- TensorFlow –
  - Created by the Google Brain team and introduced in 2015
  - Free and open source
  - Use cases -
    - Image classification
    - Natural Language processing
    - Speech recognition
- PyTorch –
  - It is a machine learning library written in Python.
  - Free and open source.
  - Use Cases -
    - Computer Vision
    - Natural Language Processing
- Keras –
  - Library of a Python API for artificial neural networks
  - Free and open source.
  - Use cases -
    - Image Classification and object detection
    - Natural Language processing
    - Healthcare
- Scikit-learn -
  - Python machine learning toolkit for data mining and analysis
  - Use Cases -
    - Customer segmentation
    - Recommender systems
    - Fraud detection
- LightGBM –
  - gradient boosting system created by Microsoft.
  - Use Cases -
    - Sales forecasting
    - Fraud detection
    - Credit risk prediction