# Artificial Intelligence & Machine Learning

# Definition, Types, Goals & applications of ML

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# What is ML?

- Machine learning is a subfield of artificial intelligence (AI). The goal of machine learning generally is to understand the structure of data and fit that data into models that can be understood and utilized by people.

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- Machine learning is a field within computer science, it differs from traditional computational approaches. In traditional computing, algorithms are sets of explicitly programmed instructions used by computers to calculate or problem solve.

- Machine learning algorithms instead allow for computers to train on data inputs and use statistical analysis in order to output values that fall within a specific range. Because of this, machine learning facilitates computers in building models from sample data in order to automate decision-making processes based on data inputs.

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- Any technology user today has benefitted from machine learning. Facial recognition technology allows social media platforms to help users tag and share photos of friends. Optical character recognition (OCR) technology converts images of text into movable type. Recommendation engines, powered by machine learning, suggest what movies or television shows to watch next based on user preferences. Self-driving cars that rely on machine learning to navigate may soon be available to consumers.

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These are three types of machine learning:

- Supervised learning

- Unsupervised learning

- Reinforcement learning/Semi-Supervised learning

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# Supervised Learning

The computer is provided with example inputs that are labeled with their desired outputs. The purpose of this method is for the algorithm to be able to "learn" by comparing its actual output with the "taught" outputs to find errors, and modify the model accordingly. Supervised learning therefore uses patterns to predict label values on additional unlabeled data.

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# Unsupervised Learning

Data is unlabeled, so the learning algorithm is left to find commonalities among its input data. As unlabeled data are more abundant than labeled data, machine learning methods that facilitate unsupervised learning are particularly valuable.

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# Reinforecement Learning

It is based on rewarding desired behaviors and/or punishing undesired ones. In general, a reinforcement learning agent is able to perceive and interpret its environment, take actions and learn through trial and error.

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# Applications

• Traffic Alerts.

•Social Media.

•Transportation and Commuting.

•Products Recommendations.

•Virtual Personal Assistants.

•Self Driving Cars.

•Dynamic Pricing.

•Google Translate.

Medical diagnosis, image processing, prediction, classification, learning association, regression etc.

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