

Introduction to Machine Learning



In 1959, Arthur Samuel, an American pioneer in the field of computer gaming and artificial intelligence popularised the term "Machine Learning" and stated that "it gives computers the ability to learn without being explicitly programmed".

So what does Machine Learning really mean?

Imagine that you are trying to toss a paper in a dustbin.

In the first attempt, you might overshoot your aim because of too much force. In the second attempt, you might reduce the force but miss the correct angle of your throw. In the third attempt, you might succeed in landing the paper in the bin. This is because our brain is learning something and making



changes after each experience and thus improving the final result. If the same can be implemented in a machine, it is called machine learning. This can now be achieved by data analytics and artificial intelligence.

Let's understand how this happens.

Machine learning can be described as a type of artificial intelligence that can identify and analyze data and "learn" to use this data for creating strategies to improve customer experience. This is a category of an algorithm that enables the computers to learn from data, predict outcomes and even improve themselves, without being explicitly programmed. There are various algorithms to choose from and it is essential to understand the pros and cons of each, in order to choose the right algorithm for your business needs.

Most common algorithms and their use cases:

1. Random Forest- In this method, multiple decision trees are constructed with each branch that represents a possible outcome or reaction. The final decision depends on the majority of the trees present in the random forest. This method of ML is used in a variety of applications like churn modeling and customer segmentation. The algorithm is commonly used in ETM (Enhanced Thematic Mapper) Devices which is primarily found in satellites for surveying landmasses and capturing images of the earth's surface.
2. Neural Networks-This is a set of algorithms that are similar to the human brain. It is designed to recognize patterns and interpret data. This method of ML is used in some of the most challenging problems in AI like speech and object recognition, natural language processing and image segmentation. One of the common examples is Stock Market Prediction.
3. Logistic Regression- This technique of ML uses the model of binary outcome to interpret and infer data. This method of ML measures the relationship between a category of dependent variables and one or more independent variables. It is used in business analysis applications for understanding marketing click-through, customer churns, and fraud detection.
4. Kernel Methods- Kernel methods are algorithms for pattern analysis. A kernel function can be used to convert any linear model into a non-linear model. This algorithm creates custom



kernels by applying domain knowledge of a problem like in a Support Vector Machine (SVM). SVMs are used in applications for face detection, bioinformatics, handwriting analysis or image classification.

5. K-Means Clustering- This is a fast, robust and simple algorithm using distinct data sets in a linear manner. This method is used for business applications that require image segmentation, customer segmentation, inventory categorization, and anomaly detection.

ML can be classified into three types-

1. Supervised ML: This is similar to human learning under the supervision of a teacher. The algorithm learns from sample data with associated responses and predicts a correct response to similar new data.
2. Unsupervised ML: When an algorithm learns from examples without any associated target responses by determining patterns on its own, the algorithm is called unsupervised ML. The algorithm restructures the data samples into new features or a new series of data responses. This is similar to humans learning by observing.
3. Reinforcement ML: This algorithm is similar to unsupervised ML; it doesn't contain any associated responses but instead has positive or negative feedback for the solution proposed by the algorithm. It can be compared to the "trial and error" method of learning in humans. The algorithm requires dynamic programming and can be taught to respond without human intervention by a system of reward and punishment.

To know more about what we do, email us at info@staqwise.com, and our team will reach out to you in 24hrs.

For more details visit us https://www.staqwise.com/en/blogs/introduction-to-machine-learning/?utm_source=article&utm_medium=referral&utm_campaign=offpage