



Role of Algorithms in Machine Learning

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DESCRIPTION

A Machine Learning algorithm, which is a part of AI, uses an assortment of accurate, probabilistic, and upgraded techniques that empower computers to pick up from the past point of reference and perceive hard to perceive patterns from massive, noisy, or complex data.

MACHINE LEARNING METHODS

Supervised ML algorithm

It is a type of Machine Learning technique that can be applied according to what was previously learned to get new data using labeled data and to predict future events or labels. In this type of learning, supervisor (labels) is present to guide or correct. For this first analysis, the known training set and then the output values are predicted using the learning algorithm [1]. The output defined by the learning system can be compared with the actual output; if errors are identified, they can be rectified and the model can be modified accordingly.

Unsupervised ML algorithm

In this type, there is no supervisor to guide or correct. This type of learning algorithm is used when unlabeled or unclassified information is present to train the system. The system does not define the correct output, but it explores the data in such a way that it can draw inferences (rules) from data sets and can describe hidden structures from unlabeled data.

Semi supervised ML algorithm

These are algorithms that are between the category of supervised and unsupervised learning [2]. Thus, this type of learning algorithm uses both unlabeled and labeled data for training purposes, generally a small amount of labeled data and a large amount of unlabeled data. This type of method is used to improve the accuracy of learning.

Reinforcement ML algorithm

In this type of learning method that gives rewards or punishment on the basis of the work performed by the system. If we train the system to perform a certain task and it fails to do that, the system might be punished; if it performs perfectly, it will be rewarded. It typically works on 0 and 1, in which 0 indicates a punishment and

1 indicates a reward.

PROBABILITY THEORY OF MACHINE LEARNING

Machine learning algorithms employ probability theory in their foundations. The probability of an event is a measure of the likelihood of it occurring in a random experiment, which is a number between 0 and 1, where 0 indicates impossibility and 1 indicates certainty. Additionally, the conditional probability is a measure of the probability of an event if another event has already occurred. The most common and popular machine learning algorithms are

Naive bayes classification algorithm (classification by supervised learning)

The naive bayes classifier is based on bayes' theorem and classifies all values as independent of all other values. This allows you to use probabilities to predict classes / categories based on a particular set of characteristics.

K-means clustering algorithm (unsupervised learning clustering)

The K-Means clustering algorithm [3] is a type of unsupervised learning used to classify unlabeled data, that is, data without defined categories or groups. The algorithm works by finding a group in the data. Here, the number of groups is represented by the variable K. Then it works repeatedly to assign each data point to one.

Support for vector machine algorithms (monitoring learning classification)

Support vector machine algorithms are monitored learning models that analyze data used for classification analysis and regression analysis [4]. They substantially filter data in a category that provides a set of training examples, and each set belongs to one or the other of two categories. The algorithm then works to build a model to assign categories or other new values.

Linear regression (monitored learning / regression)

Linear regression is the most basic regression type. Simple linear regression makes it possible to understand the relationship between two consecutive variables [5].

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