Supervised machine learning algorithms can apply what has been learned in the past to new data using labelled examples to predict future events. Starting from the analysis of a known training dataset, the learning algorithm produces an inferred function to make predictions about the output values. The system is able to provide targets for any new input after sufficient training. The learning algorithm can also compare its output with the correct, intended output and find errors in order to modify the model accordingly.

In contrast, unsupervised machine learning algorithms are used when the information used to train is neither classified nor labelled. Unsupervised learning studies how systems can infer a function to describe a hidden structure from unlabelled data. The system doesn’t figure out the right output, but it explores the data and can draw inferences from datasets to describe hidden structures from unlabelled data.

Semi-supervised machine learning algorithms fall somewhere in between supervised and unsupervised learning, since they use both labelled and unlabelled data for training – typically a small amount of labelled data and a large amount of unlabelled data. The systems that use this method are able to considerably improve learning accuracy. Usually, semi-supervised learning is chosen when the acquired labelled data requires skilled and relevant resources in order to train it / learn from it. Otherwise, acquiring unlabelled data generally doesn’t require additional resources.

Reinforcement machine learning algorithms is a learning method that interacts with its environment by producing actions and discovers errors or rewards. Trial and error search and delayed reward are the most relevant characteristics of reinforcement learning. This method allows machines and software agents to automatically determine the ideal behaviour within a specific context in order to maximize its performance. Simple reward feedback is required for the agent to learn which action is best; this is known as the reinforcement signal.

Types of Supervised Machine Learning Algorithms

Regression:

Regression technique predicts a single output value using training data.

Example: You can use regression to predict the house price from training data. The input variables will be locality, size of a house, etc.

Algorithms

Naïve Bayes Classifiers

Naïve Bayesian model (NBN) is easy to build and very useful for large datasets. This method is composed of direct acyclic graphs with one parent and several children. It assumes independence among child nodes separated from their parent.

Decision Trees

Decisions trees classify instance by sorting them based on the feature value. In this method, each mode is the feature of an instance. It should be classified, and every branch represents a value which the node can assume. It is a widely used technique for classification. In this method, classification is a tree which is known as a decision tree.

It helps you to estimate real values (cost of purchasing a car, number of calls, total monthly sales, etc.).

Support Vector Machine

Support vector machine (SVM) is a type of learning algorithm developed in 1990. This method is based on results from statistical learning theory introduced by Vap Nik.

SVM machines are also closely connected to kernel functions which is a central concept for most of the learning tasks. The kernel framework and SVM are used in a variety of fields. It includes multimedia information retrieval, bioinformatics, and pattern recognition.

In [statistics](https://en.m.wikipedia.org/wiki/Statistics), **polynomial regression** is a form of [regression analysis](https://en.m.wikipedia.org/wiki/Regression_analysis) in which the relationship between the [independent variable](https://en.m.wikipedia.org/wiki/Independent_variable) *x* and the [dependent variable](https://en.m.wikipedia.org/wiki/Dependent_variable) *y* is modelled as an *n*th degree [polynomial](https://en.m.wikipedia.org/wiki/Polynomial) in *x*. Polynomial regression fits a nonlinear relationship between the value of *x* and the corresponding [conditional mean](https://en.m.wikipedia.org/wiki/Conditional_expectation) of *y*, denoted E(*y* |*x*). Although *polynomial regression* fits a nonlinear model to the data, as a [statistical estimation](https://en.m.wikipedia.org/wiki/Estimation_theory) problem it is linear, in the sense that the regression function E(*y* | *x*) is linear in the unknown [parameters](https://en.m.wikipedia.org/wiki/Parameter) that are estimated from the [data](https://en.m.wikipedia.org/wiki/Data). For this reason, polynomial regression is considered to be a special case of [multiple linear regression](https://en.m.wikipedia.org/wiki/Multiple_linear_regression).