

Machine Learning

Machine learning is the process of making systems that learn and improve by themselves, by being specifically programmed. The ultimate goal of machine learning is to design algorithms that automatically help a system gather data and use that data to learn more. Systems are expected to look for patterns in the data collected and use them to make vital decisions for themselves. Machine Learning techniques uses data and its final output and discover the rules behind that.

Steps Involved:

- 1) Data Collection
- 2) Data Optimisation
- 3) Choosing the model
- 4) Training the model
- 5) Evaluation & optimisation
- 6) Making prediction

Types of Machine Learning approaches

- 1) Supervised Learning
- 2) Unsupervised Learning
- 3) Reinforcement Learning

Supervised Learning:

Supervised machine learning algorithms apply what has been learned in the past to new data using labeled examples to predict future events. By analyzing a known training dataset, the learning algorithm produces an inferred function to predict output values. The system can provide targets for any new input after sufficient training. It can also compare its output with the correct, intended output to find errors and modify the model accordingly.

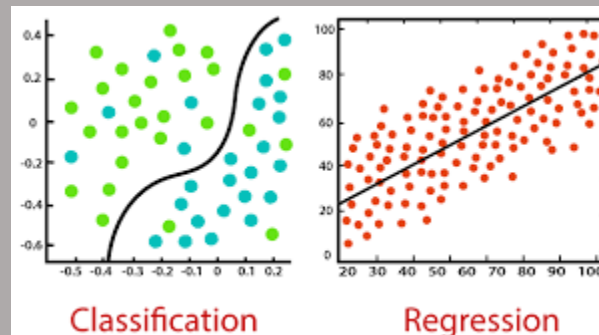
Basically, Human interference is required here in giving the relation between input and output. So, if the similar type of computation is required then the algorithm itself maps the relation and gives the output.

Classification VS Regression

Classification is a process of finding a function which helps in dividing the dataset into classes based on different parameters. In Classification, a

computer program is trained on the training dataset and based on that training, it categorizes the data into different classes.

Regression is a process of finding the correlations between dependent and independent variables. It helps in predicting the continuous variables such as prediction of Market Trends, prediction of House prices, etc.



Unsupervised Learning

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. At no point does the system know the correct output with certainty. Instead, it draws inferences from datasets as to what the output should be.

Reinforcement Learning

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

Suppose, If the input is apple picture and output is recognised as Mango then it works as feedback and corrects itself. Human interaction is needed for this method of learning.

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