

Machine learning is the use of algorithms that autonomously adapt and improve in their performance according to some criteria given a set of data.

In machine learning, the data the algorithm operates on is crucial to its success. The data must be of sufficient quantity as well as accuracy to give the algorithm as much opportunity for success as possible; the data provided is what drives its adaptation. Pattern recognition is also essential to machine learning, since the ability to recognize patterns allows the opportunity to interpret some truth behind the data.

Machine learning and artificial intelligence are closely tied together since you can find aspects of the other in each. Artificial intelligence is the ability for an inanimate object to learn based on its input and make logical decisions on it, which requires some form of machine learning algorithms. Since machine learning algorithms improve their own performance with time, there is a form of artificial intelligence since the algorithm is learning and adapting.

One example of machine learning applications are the algorithms behind social media platforms that decide which content to display to the user. By understanding what kind of content a user searches for and shows a particular interest in, these algorithms are able to display content that is pertinent to the user, allowing for a more enjoyable user experience. This would not be practical to be built in traditional programming methods since user interests are dynamic; interests phase in and out, and a static approach to predicting interests would not be able to keep up.

Another example of machine learning applications are image recognition algorithms. By feeding a machine learning application a large set of images, the algorithm is able to provide some prediction of what a given image is, hopefully to a strong degree of certainty. As more images are processed, the algorithm is better able to predict what an image is depicting. This would not be possible in traditional programming because there is no way to statically determine an image's content since, often times, the same image is never repeated. There has to be some form of prediction and guess-work, which would never be able to reach significant levels of certainty in a traditional approach.

Observations are sample data points in machine learning; this is the data that an algorithm collects and interprets, allowing for the algorithm's operation. Features are a category of data collected in the observations; they have a type and some meaning to the algorithm, and should be found in all instances of observations. Quantitative data is a subset of a feature which encompasses all numeric data forms; all forms of units that can be described numerically fall under the quantitative data category. Qualitative data is the other subset of a feature which encompasses all categorical data forms; these are the data types that have a finite set of possible values.

Machine learning is an interesting topic to me since it seems autonomous improvement is becoming more and more important in today's technology industry, and I'm certain that I will find some use in familiarizing myself with machine learning, whether that's to implement it in my work in the future or develop a new way of thinking so that my own mindset develops as I continue to work.