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Overview of Machine Learning

Machine learning is how computers learn to recognize patterns in data to create charts and graphs for data analysis, and to formulate predictions based on the recorded data.

Machine learning can also be a way for computers to determine what actions to take, based on the data at hand. Machine learning is linked to several fields, mainly those of statistics, computer science, data science, and artificial intelligence.

Data is vitally important for machine learning, as one cannot learn about the patterns formed in data and create predictions with some accuracy without data. Both go hand in hand, as computers do not know how to recognize patterns in data and must be taught how data should be organized and what kind of data to take in, so that the computer can begin recognizing patterns. Pattern recognition is just as important, in order to develop a prediction with a certain accuracy. Pattern recognitions also serve to help determine what actions should be taken by a computer when a specific pattern in data is detected. Accuracy is necessary in both, otherwise it just leaves the computer making wild guesses and not actual predictions.

Machine Learning and Artificial Intelligence are related in that Machine Learning is a subset of

the field of artificial intelligence. Where artificial intelligence is the designing and development of intelligent machines, machine learning is more focused on developing machines that focus on processing and analyzing data, to provide predictions with better accuracy, and recognize patterns in data much faster than humans.

One example of modern machine learning applications is the algorithmic recommendations often used in service applications, especially social media applications. Another example of modern applications of machine learning is text generation and analysis, often used in word processors, text correcting applications, and chatbots. These applications can not be built with traditional programming, since traditional programming is focused more on the specific problem and generate manually the necessary output, whereas machine learning is automated and data-driven, requiring only the algorithms it uses to learn and recognize changes in data and generate a prediction model, something that traditional programming cannot do.

Observation is the instances of data that have been recorded by the computer, displayed as rows in a data table. Features, or attributes, are the types of data that are collected from the observation and can be numerical or categorical. Quantitative data is the numerical attributes of observations, while qualitative data are the categorical attributes of observations. All these aspects of data are important to machine learning, since the data collected by the computer must be organized and the machine should be able to distinguish between numerical and categorical data types.

Machine learning is interesting in terms of how it learns and improves its own algorithms used for learning and analyzing data, as well as being able to recognize patterns in the data that it organizes and determines a decisive action to take based on the data collected. I definitely would like to learn more about machine learning for personal projects as well as to add to my skill set for future professional applications.

