Overview of Machine Learning

The concept of machine learning is, simply put, the training of a machine to analyze patterns in data, so that accurate predictions and analyses of future data can be made. At its core, machine learning isn't possible without the existence of data. Without data, machine learning algorithms wouldn't be able to learn anything, as the algorithms learn by discovering patterns in data. And even then, once those patterns are discovered, the algorithm must validate a guess based off the pattern, and further analyze other samples of data to gauge the accuracy of that guess. This is what allows machines to make more accurate predictions with the more data it analyzes.

The subject of machine learning is derived from artificial intelligence, alongside computer science, probability, and statistics. Essentially, the development of the concept of machine learning wouldn't have been possible without the principles of artificial intelligence and computer science. So, machine learning is merely a subset of artificial intelligence. Some examples of modern-day machine learning applications include, but are not limited to, voice & face recognition, fraud detection, and weather forecast predicting.

In machine learning, data can be represented in a couple of ways: either as quantitative data – represented by a number, or qualitative data – represented by a finite set of values. Each instance of data within a data set is known as an observation, and each observation contains a variety of attributes, also known as features. These observations usually contain at least one attribute is the target/response, which represents the part of the data that we are trying to make predictions of and find a pattern for. Each are important in machine learning as they form the basis for the machine's data analysis, and therefore the machine's learning.

Personally, I am interested in machine learning largely for the fact that I believe it to be one of the fields that stands as the future of computer science – and technology as a whole – as it is considerably practical and applicable to real problems. Additionally, I think that learning more about machine learning, and learning how to apply it in programming, would be useful to me in any future personal projects that I want to work on. Perhaps learning this would allow me to take up some past personal projects that I previously felt weren't realistic.