Overview of ML

Machine learning, put simply, is pattern recognition. It is a method of training computers to analyze, predict, and take action using data. The accuracy and utility of machine learning is influenced by the data fed into algorithms, so biased or inaccurate data will create biased or inaccurate predictions. Gathering data, ensuring that the way data is collected is ethical, confirming that one is authorized to use it, and cleaning data are all part of machine learning.

Artificial intelligence is trying to make computers act like humans or emulate humans' behavior. Autonomous agents are used in the world to make smart decisions and can be seen in the real world with smart home systems. Machine learning can be used as the basis for an autonomous agent and other applications in AI so the two are used closely together.

Machine learning is beneficial when traditional algorithms are not enough to solve a given problem. An example would be facial recognition – there is no traditional algorithm to recognize faces because humans learned how to do it in childhood and after years of relying on intuition are unable to provide concrete steps on how exactly to do it. Another example would be if the problem is simply too large to solve even with traditional programs, such as trying to find patterns in a vast amount of data. Machine learning algorithms excel at this and are a suitable solution to an otherwise immensely time-intensive task.

Observations are 'rows' and features are 'columns' in a data set and are useful to understand as individual instances of data and attributes of data, respectively. Quantitative data are numeric and qualitative data are something one can put into a type or category. Defining this distinction between quantitative and qualitative data is important for understanding what the meaning of the data actually is and whether one should view an attribute as a measure on a continuous scale or as a discrete type.

I am interested in ML as a way to make things more autonomous and convenient for people. As more innovative algorithms are created, I would like to understand and formulate applications to them in both personal projects and in my professional work. In the meantime, I look forward to learning more about the current state of ML and the conventional ways of using it.