Overview of ML

Machine Learning, or ML, is considered to be a component of Artificial Intelligence, or AI. ML is research revolving around developing "learning" processes that use data to train itself to perform better on certain tasks.

ML heavily relies on data as the basis for its model's training and knowledge. Good accuracy in models require quantity and quality in data input. In order for the model to produce predictions or judgments, pattern recognition, or the ability to spot patterns or relationships within the data, is also required. Accuracy is used as a metric to assess a model's effectiveness in how well it can predict something.

ML and AI are interrelated but distinct fields of study and research. AI is the umbrella term for an area of study that involves developing systems that can perform tasks that humans typically can. This may include concepts such as speech recognition, natural language processing, and decision making. On the other hand, ML is a subset of AI that specifically deals with the development of the algorithms and models used by these systems to learn data.

One example of modern machine learning application is Natural Language Processing, or NLP. NLP uses machine learning algorithms and models to comprehend human language, such as in speech recognition. NLP cannot be built with traditional programming because it would need an impractically large number of programming to account for all the variations of spoken and written language that mean the same thing. Language is also ever-changing, and the program would not be able to update itself and scale with time. Another example of modern machine learning application is Image Recognition. Models can be trained from large sets of images that have classified, and would be capable of extrapolating to images not found in the dataset (ideally). Image recognition cannot be built with traditional programming because there are too many variations of images that may represent the same thing. Additionally, there are always new images and objects to identify, and the program would not be able to classify these new things over time.

Observation is a single "datapoint" used in analysis. Data collection is significant because they may indicate patterns that the model seeks. A feature is a factor of an observation that the model may use as input. Quantitative data is numerical and empirical data that can be used to analyze and compare algorithms and different methods. Qualitative data is non-numerical and is not quantifiable. They may be used to classify observations and analyze other things that quantitative data cannot.

I believe that ML is growing in interest as time goes on, and I find the concept very interesting to understand and develop. I would like to learn ML for my own use in both personal projects and professional applications. In the past, I learned about NLP, which uses ML techniques to process human language. I would like to build on my current knowledge so that I may fully utilize all that ML and NLP offers for myself in the future.