Anurag Diwate
CS4375.004
26 January 2023

Overview of Machine Learning

A. I define Machine Learning as the usage of algorithms and statistical data to create computing methods and functions that can learn and adapt by analyzing patterns not made explicit.
B. Data is crucial to machine learning, as it is the data that helps ML algorithms find trends and patterns in the data to be able to accurately execute tasks such as recognition and prediction. Pattern recognition is important in machine learning, since finding patterns helps the ML model get more accurate, and is able to better find links in the input data. Finally, the accuracy that is achieved by finding patterns in data is what an ML model can be judged by. A good ML model is one with a high degree of accuracy in accomplishing the assigned task.
C. Artificial Intelligence or AI is the simulation of human intelligence processes by machines, especially computer systems. Machine Learning or ML is an application of AI, wherein data and statistics is used to train machine algorithms that are capable of finding patterns without explicit instructions.
D. The first example of machine learning that could not have been built through traditional programming is AI chatbots such as ChatGPT. The way that ChatGPT is able to improve itself is through data it receives as feedback from previous questions it has answered. In a traditional software, there would be no way to improve the model using feedback without explicitly programming it in. Another example of machine learning that could not have been developed using traditional development are deep learning models such as Dall-E. The ability to use natural language as input data to then generate useful and accurate images would have been impossible using traditional development.
E. In Machine Learning, an observation is an instance wherein the data was collected. In a tabular arrangement of our data, an observation would be a row of data. On the other hand, a feature is the explanatory factor of data. In our table, a feature would be a column of data. Data itself is split into two main types. Quantitative Data is numeric data, where statistics can be used to dissect and parse information. Qualitative data on the other hand is categorical data, which can be used to categorize the related information.
F. I became interested in studying Machine Learning after I spent time learning about cloud infrastructure. There I realized how important data can be, and how big data can be used to train ML algorithms to accomplish tasks that previously seemed impossible through traditional programming. This is why I would like to learn more about Machine Learning, so that I can understand how to use data to train and develop algorithms that can help me get more from that data than what I manually could.