Overview of Machine Learning

Machine learning (ML) refers to certain algorithms that interact with data. Trained on datasets, these algorithms identify various patterns and infer some form of knowledge. ML is closely related to artificial intelligence (AI). AI represents the general ability of emulating human intelligence. On the other hand, ML defines a subset of techniques that leverage experience-based learning.

Some examples of modern ML applications are image recognition and credit card fraud detection. ML applications cannot be built with traditional programming due to two reasons: complex modeling and high data volume. Regarding image recognition, traditional programming's rules cannot capture all of the facial characteristics. As for credit card fraud detection, traditional programming must manually extract patterns from a potentially large dataset.

ML emphasizes the importance of data, pattern recognition, and accuracy. Data enables ML models to learn and draw different insights. By recognizing patterns, the algorithms can perform inference on new data. Accuracy can be used to evaluate the performance of models. This ensures that models follow baseline standards.

ML terminology defines various data-related terms. A dataset consists of multiple observations (sample data points). Each observation has multiple features. Features represent the data's individual characteristics. They can have quantitative or qualitative properties. Quantitative features have numeric values. Qualitative features have one of a finite set of values.

Regarding personal interests, I would like to learn more about ML. Through this course, I hope to practice and understand the fundamentals. Outside of class, I want to learn how to leverage ML in personal projects. I am curious how to utilize ML with other technical skill sets.