

An Overview of Machine Learning

I. What is Machine Learning

Machine learning is when machines are able to utilize algorithms and models to detect patterns in a given set of data or information. Moreover, when it comes to making predictions and coming to conclusions, given a sufficient amount of relevant data, machines can learn more accurately and reduce uncertainty. Machine learning has become a vital component for companies wanting to analyze data and make the best business decisions for both the company and its customers.

II. Data, Pattern Recognition, and Accuracy in Machine Learning

As mentioned above, data, pattern recognition, and accuracy are all of great importance in machine learning, and all work synonymously to determine the performance of a machine and how well it learns. Data can take many forms and determining how ethical and trustworthy it is must be top of mind when gathering data. A machine requires a sufficient amount of relevant data before it can accurately recognize patterns, trends, and behaviors. Pattern recognition is how the machine learns and makes its own predictions based on what it understands from the data given. And finally, accuracy is how well a machine can produce correct, quality predictions.

III. Artificial Intelligence vs. Machine Learning

Artificial intelligence is when a computer is able to mimic human behaviors and ways of thinking to perform both simple and complex tasks. Alexa, is a prevalent example of AI in which it is able to complete tasks like changing songs, turning lights off in the house, etc. Whereas, machine learning, a subset of AI, is when a computer continuously learns and adapts through the data its given. Decision making is a major part of machine learning.

IV. Examples of Modern Machine Learning Applications

One example of modern machine learning applications is in social media like Instagram, Pinterest, TikTok, etc. These social media applications utilize machine learning to moderate the content which a user is interested in. In these types of applications machine learning is preferred over traditional programming because we want to learn from the user data (activity, search, likes, follows) and provide suggestions which may better cater to that user and improve user experience.

Another example of modern machine learning applications are streaming services and offering recommendations based on what a user watches or shows interest in. Alike, social media, machine learning is preferred over traditional programming because it enables a system to learn from user trends and provide predictions of what a user may like to watch.

V. Definitions – Observation, Feature, Quantitative Data, Qualitative Data

An observation in machine learning is a single instance of data. Observations are important in machine learning because a group of observations make up a data set. A feature is like the classification of data. Features are important in machine learning so that we understand what the data represents in the real world. Quantitative data refers to numerical data. With quantitative data a machine can make necessary calculations to improve its predictions and conclusions. Whereas, qualitative data refers to categorical

data. Moreover, qualitative data acts as the “indicators [which] express the characteristics of the data” (“What is Qualitative Data”, Geeks for Geeks).

VI. Personal Interest in Machine Learning

Before signing up for this course, I knew very little about machine learning and almost avoided taking it. However, my friend really advocated for this course and emphasized that students were able to apply what is learnt in class through the assigned projects. After going to a few classes, I see now that machine learning plays a significant role in most industries where data is involved and I am now excited to expand my knowledge in machine learning. As of now, I am interested in learning more on how to apply machine learning to the beauty industry. Moreover, developing suggestion engines based on user preferences. For example, if a user wants to see products that match their skin tone based on some skin tone range, or find products which have specific ingredients that are safe for their skin type (dry, combination, etc.). So, learning about data collection and identifying patterns to come to the best conclusions are just a few of the things I want to learn more about.