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CSC 405

Using Machine Learning to Predict Stock Market

For investors, it is important to predict the stock market to make better investment decisions. This prediction can be made with machine learning when we have a large quantity of valid stock data and a good machine learning algorithm. This Wednesday Dr. Daniel McGibney, a professor from UM's Business School, talked about how we can predict stocks by using features and technical indicators from historical stock data and several machine learning algorithms.

McGibney said that to predict the stock market one has to select indicative features and an optimal machine learning algorithm to "learn" from historical stock data. The features he chose include several technical indicators in the stock market, such as five day close percentage, simple moving average, and relative strength index. After running ordinary least squares algorithm using the features selected, he found some minor correlations and patterns. Then he included some additional features, such as day of week, adjusted volume percent change, and market characteristics, in hopes of getting stronger correlations. Including market characteristics data, which is data related to performance of the stock market in general, allows him to verify his prediction against market trends. Lastly he used random forest algorithm to test the optimal accuracy of the predictions and found a 56.6% accuracy, which means his stock market prediction is correct more than half of the time. This result is promising since it shows that machine learning can indeed help us make better decisions, since typically we have no way to guarantee that our own predictions of stocks are correct more than half of the time. It is also better than the 50% chance of accuracy if we were to make decisions based on coin flips. McGibney suggested that to reach higher prediction accuracy he can consider using more features, more data sources, and perhaps other machine learning models. Even then, achieving an accuracy of 56.6% is remarkable.

Machine learning gives us the capability to predict the future based on historical data. It allows us to pick up preexisting patterns from a huge amount of data that we could have never noticed before and use them to predict future events. This technique of using data to predict patterns can be applied in a broad range of fields and situations, where predictions are needed to make better decisions and to achieve better outcomes. While we have seen the extensive usage of machine learning in biomedical research such as cancer detection, as McGibney has demonstrated we could use machine learning to predict economic events. Similar to McGibney's work, we can also use machine learning to predict other markets such as the cryptocurrency market. The applications of machine learning can be in almost any field where there is an abundant data and a need to predict the future. The work that McGibney showcased was just an an example of a type of prediction machine learning can make. The result of it is a better and smarter decision that are statistically proven to be accurate to a certain level, which is not something that could be easily done before.