Fall Semester (2022-2023)

SWE1901 - Technical Answers for Real World Problems (TARP)
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Bitcoin Price Prediction Using Machine Learning

Abstract:

After the boom and bust of cryptocurrencies' prices in recent years, Bitcoin has been increasingly regarded as an investment asset. Because of its highly volatile nature, there is a need for good predictions on which to base investment decisions. Although existing studies have leveraged machine learning for more accurate Bitcoin price prediction, few have focused on the feasibility of applying different modeling techniques to samples with different data structures and dimensional features. To predict Bitcoin price at different frequencies using machine learning techniques, we first classify Bitcoin price by daily price and high-frequency price. A set of high-dimension features including property and network, trading and market, attention and gold spot price are used for Bitcoin daily price prediction, while the basic trading features acquired from a cryptocurrency exchange are used for 5-minute interval price prediction. Statistical methods including Logistic Regression and Linear Discriminant Analysis for Bitcoin daily price prediction with high-dimensional features achieve an accuracy of 66%, outperforming more complicated machine learning algorithms. Machine learning models including Random Forest, XGBoost, Quadratic Discriminant Analysis, Support Vector Machine and Long Short-term Memory for Bitcoin 5-minute interval price prediction are superior to statistical methods. Our investigation of Bitcoin price prediction can be considered a pilot study of the importance of the sample dimension in machine learning techniques.

Problem Statement:

To develop a model which can help us to predict the price of the crypto currency used like Bitcoin, with low error rate and a high precision of accuracy. The model will not tell the future, but it might forecast the general trend and the direction to expect the prices to move.