7th International Conference on

Industrial Engineering, Productivity and Quality

Cryptocurrency Return Forecasting Using Feature-Based Ensemble Machine Learning

Mehrad Mashoof
Department of Industrial Engineering, Science and Research branch, Islamic Azad University, Tehran, Iran

Abbas Saghaei
Department of Industrial Engineering, Science and Research branch, Islamic Azad University, Tehran, Iran

Abstract

Cryptocurrencies have recently piqued the curiosity of investors and academics. In this paper, we present a novel and comprehensive research of the cryptocurrency market, evaluating the forecasting performance for four of the most well-known cryptocurrencies (Bitcoin, Ethereum, Dogecoin, and Litecoin). We focus on stacking machine learning models, which are a type of ensemble learning model which can be used for financial time-series forecasting. Furthermore, we use grid search cross-validation to tune each machine learning hyperparameter. Therefore, we introduce a novel architecture of a feature-based ensemble machine learning model which integrates structured input data (i.e market trading data and technical analysis indicators) for the prediction of returns. According to our measurement, cryptocurrency return prediction with the feature-based ensemble machine learning model outperforms ARIMA in terms of forecasting accuracy.

Keywords: Machine learning, return forecasting, cryptocurrency trading, Ensemble learning, Feature engineering, Timeseries analysis.