World Academy of Science, Engineering and Technology
International Journal of Law and Political Sciences
Vol:17, No:01, 2023

Predicting Options Prices Using Machine Learning

Authors : Krishang Surapaneni

Abstract : The goal of this project is to determine how to predict important aspects of options, including the ask price. We want to compare different machine learning models to learn the best model and the best hyperparameters for that model for this purpose and data set. Option pricing is a relatively new field, and it can be very complicated and intimidating, especially to inexperienced people, so we want to create a machine learning model that can predict important aspects of an option stock, which can aid in future research. We tested multiple different models and experimented with hyperparameter tuning, trying to find some of the best parameters for a machine-learning model. We tested three different models: a Random Forest Regressor, a linear regressor, and an MLP (multi-layer perceptron) regressor. The most important feature in this experiment is the ask price; this is what we were trying to predict. In the field of stock pricing prediction, there is a large potential for error, so we are unable to determine the accuracy of the models based on if they predict the pricing perfectly. Due to this factor, we determined the accuracy of the model by finding the average percentage difference between the predicted and actual values. We tested the accuracy of the machine learning models by comparing the actual results in the testing data and the predictions made by the models. The linear regression model performed worst, with an average percentage error of 17.46%. The MLP regressor had an average percentage error of 11.45%, and the random forest regressor had an average percentage error of 7.42%

Keywords : finance, linear regression model, machine learning model, neural network, stock price
Conference Title : ICHEL 2023 : International Conference on Higher Education Law
Conference Location : New York, United States
Conference Dates : January 30-31, 2023