ABSTRACT

Gold is one of the most popular investment instrument due to its stability and well-maintained value. However, predicting gold price movements is challenging as it is influenced by various macroeconomic factors, such as inflation, interest rates, and geopolitical conditions. Time series prediction models have become essential elements in investment, where asset price movements like gold need to be accurately predicted to support decision-making. Long Short-Term Memory (LSTM) is an effective algorithm in predicting non-linear time series, such as gold prices, due to its ability to handle long-term dependencies in data and recognize hidden patterns in historical data. This research implements the LSTM method in predicting gold prices, with hyperparameter optimization using Random Search to achieve optimal prediction accuracy. The data used is daily gold price data taken from January 1, 2014, to April 1, 2024, with features including Close, Open, High, and Low prices. The model is evaluated using evaluation metrics such as Mean Squared Error (MSE), R-Squared, and Mean Absolute Percentage Error (MAPE). The implementation results show that the LSTM model with Random Search optimization achieves good performance, with an MSE value of 0,0004, R-Squared of 96.86%, and MAPE of 2.13%. This indicates that the implementation of the LSTM method optimized using Random Search can produce accurate gold price predictions. The combination of LSTM ability to handle time series data and hyperparameter optimization through Random Search results in a reliable model for predicting gold price movements.

Keywords: Long Short-Term Memory, Random Search, Deep Learning, Hyperparameter Optimization, Gold Price Prediction.