Abstract

The stock market is inherently volatile and influenced by numerous complex factors, making precise price prediction a challenging task. This paper proposes a deep learning approach for stock price forecasting using a Long Short-Term Memory (LSTM) network, capable of capturing long-term temporal dependencies in financial time-series data. The model is trained on Google's historical stock prices to predict future closing values based on 60 previous timesteps. Prior to training, the dataset is normalized and reshaped to suit the sequential input requirements of the LSTM architecture. The proposed network comprises multiple stacked LSTM layers with dropout regularization, optimized using the Adam optimizer and evaluated with the Mean Squared Error (MSE) loss function. Experimental results indicate that the model successfully captures stock price trends and closely aligns with actual market movements. The findings suggest that LSTM-based models can significantly enhance the accuracy and reliability of stock market forecasting.

Keywords: Stock Price Prediction, LSTM, Deep Learning, Time-Series Forecasting, Neural Networks