

Research on LSTM deep learning model applied to stock price prediction problem

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Abstract: This study investigates the application of Long Short-Term Memory (LSTM) deep learning models for stock price prediction. Stock market forecasting is inherently challenging due to the non-linear, volatile, and time-dependent nature of financial data. Traditional statistical models often fail to capture long-term dependencies and complex temporal patterns. To address this, we propose an LSTM-based predictive framework designed to learn from historical price sequences. The model was trained and evaluated using historical stock data, with performance measured against standard metrics such as Root Mean Square Error (RMSE) and Mean Absolute Error (MAE). Experimental results demonstrate that the LSTM model effectively captures underlying trends and temporal correlations, outperforming baseline models like ARIMA and simple Recurrent Neural Networks (RNNs) in prediction accuracy. The findings confirm that deep learning, particularly LSTM architecture, offers a robust approach for financial time series forecasting, providing valuable insights for investors and analysts. This research contributes to the growing body of evidence supporting the efficacy of deep learning in quantitative finance.

Keywords: LSTM, deep learning, stock price prediction, time series model