Forecasting Stock Price using Machine Learning

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Abstract: *The main goal of this study is to forecast stock market movements using machine learning and deep learning methods. Since the stock market is a dynamic system influenced by many variables, it is difficult to make precise predictions. The intricate patterns and nonlinear interactions found in financial data are difficult to detect using conventional methods. This study investigates the use of the Long Short-Term Memory (LSTM), Gated Recurrent Unit (GRU), and Random Forest models to address these issues. Recurrent neural networks (RNNs) with the LSTM and GRU variations can recognize both short- and long-term dependencies in data. These models are suitable for stock market prediction since they have demonstrated promise when analysing time series data. An ensemble model of decision trees called Random Forest uses group forecasts to improve accuracy. The models are trained and assessed using historical stock data and pertinent financial indicators. Metrics like mean squared error, accuracy, and precision are used to gauge performance. Results show that LSTM, GRU, and Random Forest are superior to conventional approaches in capturing complicated patterns and enhancing forecast accuracy. Limitations and difficulties are noted, though, such as the necessity for cautious feature selection, potential overfitting, and the stock market's inherent volatility. The potential for additional study and advancements to further improve these models' predictive powers is highlighted in the paper's conclusion.*

Keywords: Gated Recurrent Unit

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