Project Check-in 1
Individual Report

Project Info: Market Trends Comparison of Models Report

Team:

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Project Activities Completed Since Last Check-in

I read a few refrence papers.

Literature Survey 1: Stock Market Price Prediction Using LSTM RNN" by Kriti Pawar, Raj Srujan Jalem, and Vivek Tiwari

Stock Market Price Prediction Using LSTM RNN | SpringerLink (sjlibrary.org)

The paper titled "Stock Market Price Prediction Using LSTM RNN" by Kriti Pawar, Raj Srujan Jalem, and Vivek Tiwari introduces the use of Recurrent Neural Network (RNN) with Long Short-Term Memory Cells (LSTM) for stock market prediction and portfolio management based on historical stock data. The paper compares the LSTM RNN model with traditional machine learning algorithms such as Regression, Support Vector Machine, Random Forest, Feed Forward Neural Network, and Backpropagation. The study also considers the impact of customer sentiments and market trends on stock prices.

The authors discuss the challenges of predicting stock market trends due to various factors, including economic changes, product value, investor sentiments, and external events. They review related work in the field of stock market prediction, including the use of Hidden Markov Models, Support Vector Machines, linear regression, and ensemble methods.

The paper presents details of the LSTM RNN model's architecture, including the use of LSTM cells to address long-term dependencies in stock data. Various LSTM architectures and configurations are tested, and the results are compared. The authors use historical stock data from companies like Apple Inc., Google, and Tesla Inc. for training and testing the model.

The paper concludes that the RNN-LSTM model provides more accurate results than traditional machine learning algorithms, making it potentially valuable for individual traders and corporate investors. The authors also suggest that future work could involve incorporating sentiment analysis of customer reviews to enhance predictions.

Overall, the paper explores the use of deep learning techniques, specifically LSTM RNN, for stock market prediction and demonstrates its potential for improving portfolio management strategies.

Literature Survey 2: "Predicting the direction of stock market prices using random forest" by Luckyson Khaidem, Snehanshu Saha and Sudeepa Roy Dey

[1605.00003.pdf (arxiv.org)](arxiv.org)

This paper presents a machine learning approach using Random Forests for predicting stock price trends. The key points are:

- The goal is to predict whether stock prices will rise or fall after a certain period (1 month, 2 months etc) to guide buy/sell decisions.
- Technical indicators like RSI, Stochastic Oscillator, Moving Average Convergence are extracted from historical price data as input features.
- Random Forest creates an ensemble of decision trees trained on bootstrapped samples of the data.
- Predictions are made by taking the majority vote of the decision trees. More trees reduce generalization error.
- The model is evaluated using accuracy, precision, recall, specificity metrics on Apple, GE, Samsung datasets.
- High accuracy of 84-94% across time periods demonstrates effectiveness for stock trend prediction.
- Model outperforms SVM, neural network, and other models on the same data in prior works.
- Random Forest handles nonlinearity in stock data relationships better than other models.

In summary, the paper presents a Random Forest ensemble model for predicting stock price trends using technical indicators as features. Comparative evaluation shows it achieves higher accuracy than prior approaches due to better handling of nonlinear stock data.

Project Activities in Progress

Thus far, I have reviewed and summarized several research papers related to our project topic. Through this process, I have gained valuable insights that helped guide our selection of the two machine learning models we will implement for stock price prediction. In addition to summarizing relevant literature, I have also contributed to project documentation efforts. For our data source, we will be using the Yahoo Finance API to access and gather the financial data required for our analysis. This API will provide us with a reliable and comprehensive dataset for our stock price prediction models, ensuring that we have access to up-to-date and relevant financial information.

Project Activities Planned

We are in the process of implementing models with the aim of facilitating their comparison.

GitHub/Google Drive links

Peer evaluation

Every member of our team is actively collaborating and making an equal contribution to the project.