Stock Market Prediction for AAPL

Project Design Presentation

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Project Design Presentation

- Introduction

- Project Architecture

- Data Flow Pipeline

- Evaluation Metrics

- Expected Outcome

- Conclusion & References

Introduction

- Stock price prediction is complex due to extreme volatility and non-linearity

- Traditional models struggle to capture long term trend

- Advanced feature engineering to boost the LSTM models performance

- Using related stocks that influence APPLE stock and analysing the features

Project Architecture

- Data Collection: Yahoo finance API

- Data Preprocessing: Cleaning, normalization, feature extraction.

- VAR Baseline: Captures linear dependencies.

- LSTM Model: Learns sequential patterns.

- Advanced LSTM model using advanced feature engineering

Data Flow Pipeline

- Fetch stock data.

- Preprocess & clean data.

- Train VAR Model (baseline).

- Train LSTM Model (future predictions).

- Compare and validate predictions

- Technologies & Tools: Python, TensorFlow, Scikit-learn, Statsmodels, Pandas, NumPy, Matplotlib.

Evaluation Pipeline

- RMSE (Root Mean Squared Error)

- MSE (Mean Squared Error)

- MAPE (Mean Absolute Percentage Error)

Expected Outcome

- VAR baseline for stock prediction.

- Advanced LSTM model for improved accuracy.

- Comparative study of models' effectiveness.
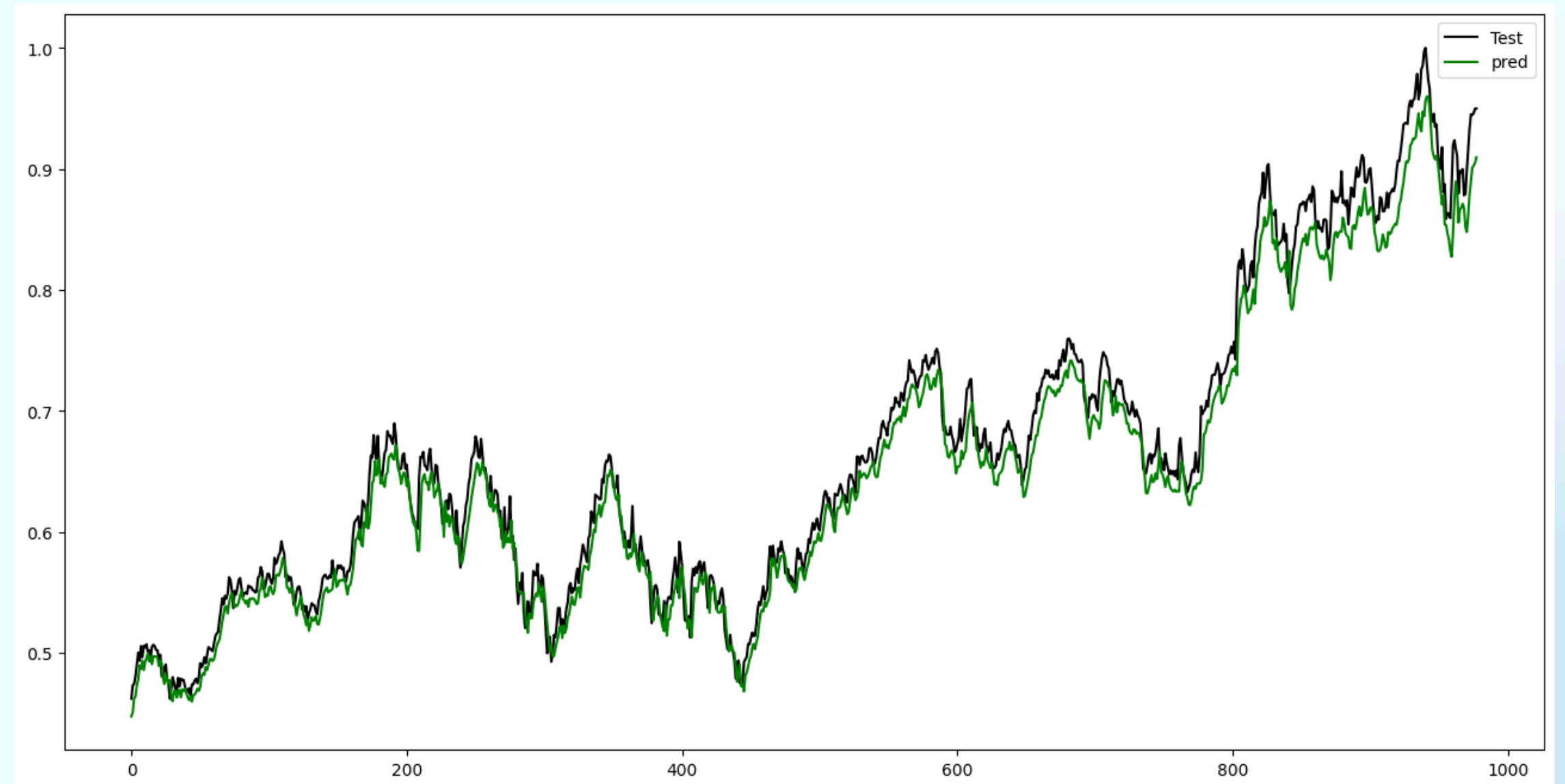
Conclusion

- **Challenges & Risks:**

  - Market volatility affects predictions.

  - LSTM model may overfit with limited data.

  - Ensuring stationarity in the VAR model.

- **Conclusion:**

  - Advanced LSTM Model that improves stock prediction accuracy

  - Combining statistical and deep learning approaches enhances predictions.

  - Future scope: Extending to multi-stock portfolio predictions.

- **References:**

  - Yahoo Finance, Keras Documentation, Research Papers on Stock Prediction using LSTM & VAR.

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