

Bitcoin Price Prediction System Using LSTM Model and Azure Deployment

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Content

Abstract

The project aims to develop a Bitcoin price prediction system using Long Short-Term Memory (LSTM) networks and Azure for real-time insights. The system uses historical price data to forecast future trends, aiding investors and analysts in decision-making. The study evaluates the model's accuracy using RMSE and compares it with traditional methods like ARIMA. Future enhancements include incorporating additional data sources, continuous retraining, and expanding predictions to other cryptocurrencies.



Introduction

This project develops a Bitcoin price prediction system using an LSTM model deployed via Azure, providing real-time insights. The system uses historical price data to forecast trends, aiding informed trading decisions. Key investigations include selecting optimal hyperparameters, evaluating model performance, and comparing the LSTM model with traditional methods. The study explores the implications of accurate Bitcoin predictions for investment strategies, potential limitations due to data quality and market volatility, and future enhancements.

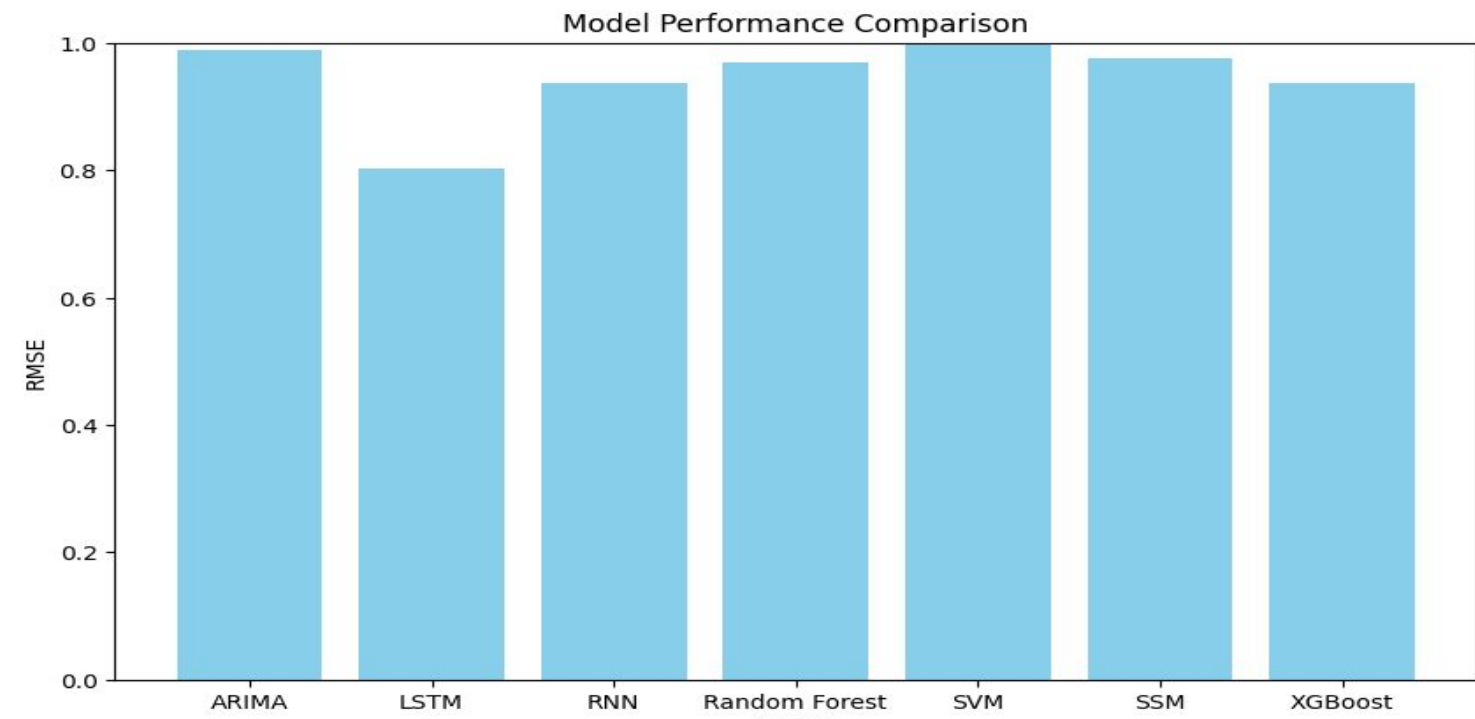


Web Application

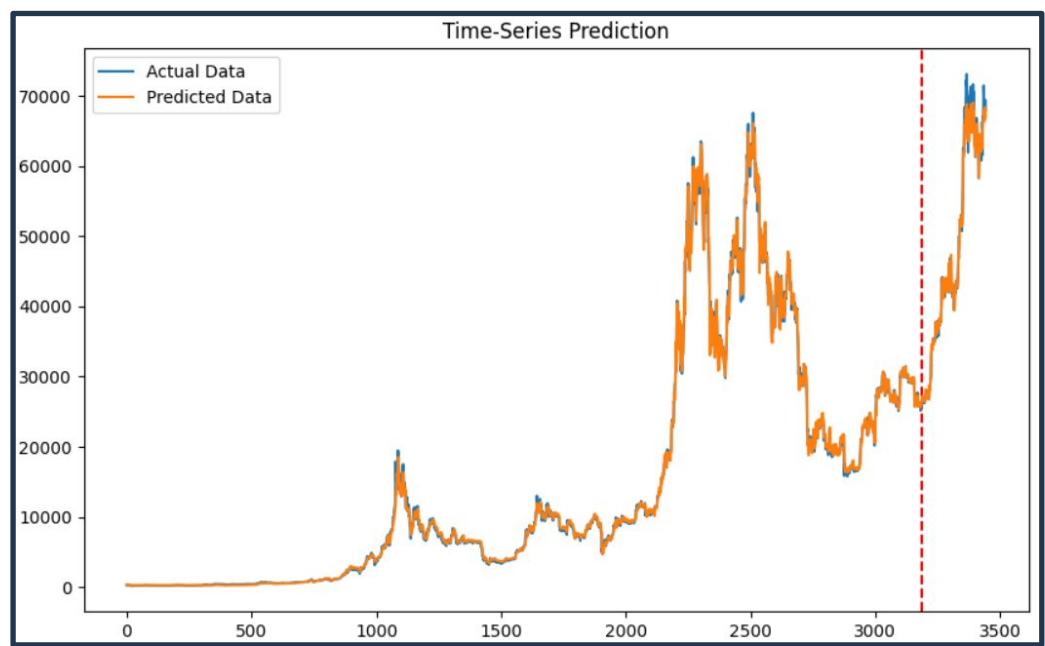


Results

The first graph shows the accuracy of various predictive models using a bar chart, with the LSTM model achieving the lowest RMSE value, indicating its effectiveness in capturing complex, non-linear patterns in Bitcoin price test data. The second graph shows a time series plot of actual Bitcoin prices and predicted prices by the LSTM model, demonstrating its ability to closely follow the actual price trend and highlighting its predictive accuracy. The dotted red line divides the train and test data at the left and right sides respectively.



RMSE values of different plots(on test data)



Comparison of actual data and predicted values

Discussion & Conclusion

The LSTM model for Bitcoin price prediction provides significant insights into market trends, aiding investors and financial analysts in making informed decisions that can lead to higher returns and reduced risk. This robust solution, enhanced by Azure's deployment capabilities, results in a user-friendly and accessible web application for real-time market analysis. However, the model's performance is highly dependent on the quality of historical data and can be affected by unpredictable market events. Future work will focus on incorporating additional features like macroeconomic indicators, expanding predictions to other cryptocurrencies, and continuously retraining the model with new data to maintain its accuracy.

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- [LSTM Reference](#)
- [Azure Documentation](#)
- [Bitcoin Historical Data](#)
- [Flask Documentation](#)