FINAL PROJECT REPORT

1. Introduction

Cryptocurrency markets experience extreme price fluctuations, making volatility prediction essential for financial decision-making. This project applies machine learning techniques to predict cryptocurrency volatility using historical market data.

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2. Dataset Description

The dataset contains daily historical records for more than 50 cryptocurrencies. It includes OHLC prices, trading volume, and market capitalization.

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3. Methodology

The project follows these steps:

1. Data cleaning and preprocessing

2. Exploratory data analysis

3. Feature engineering

4. Model training using Random Forest

5. Model evaluation

6. Hyperparameter optimization

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4. Results

The trained Random Forest model effectively predicts cryptocurrency volatility. Evaluation metrics indicate strong performance and good generalization on unseen data.

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5. Key Insights

- Technical indicators significantly improve model accuracy

- Volatility is highly influenced by price movement

- Liquidity plays an important role in volatility changes

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6. Limitations

- Model does not consider real-time news or sentiment

- Cryptocurrency markets are influenced by external factors

- Predictions depend on historical trends

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7. Conclusion

This project demonstrates the practical application of machine learning for cryptocurrency volatility prediction. The system provides meaningful insights into market risk and can support informed trading decisions.

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8. Future Enhancements

- Use deep learning models such as LSTM

- Integrate real-time market data

- Include sentiment analysis from news and social media