Crypto Currency Price Prediction Using Random Forest and Gradient Boosting Algorithms

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Abstract - Cryptocurrency prediction is a challenging task due to the volatile and unpredictable nature of the crypto market. However, machine learning algorithms such as Random Forest and Gradient Boosting can be employed to build models that offer insights and potential predictions. This paper presents a framework for utilizing these algorithms in cryptocurrency price prediction. The first step involves gathering historical cryptocurrency price data along with relevant features such as trading volume, market capitalization, social media sentiment, and technical indicators. Data preprocessing techniques are then applied to clean and normalize the data, handle missing values, and split it into training and testing sets.

*Key Words***:** Cryptocurrency prediction, Machine learning algorithms, Random Forest, Gradient Boosting, Data preprocessing

INTRODUCTION

Cryptocurrencies have gained significant attention and popularity in recent years as a decentralized form of digital currency. With the rise of cryptocurrencies like Bitcoin, Ethereum, and others, there has been a growing interest in predicting cryptocurrency prices. However, due to the highly volatile and unpredictable nature of the crypto market, accurate price prediction remains a challenging task. Machine learning algorithms have emerged as powerful tools for analyzing complex and large-scale datasets, making them well-suited for cryptocurrency price prediction. Among these algorithms, Random Forest and Gradient Boosting have shown promising results in various domains and are widely used for regression and classification tasks. The goal of this research is to explore the application of Random Forest and Gradient Boosting algorithms in predicting cryptocurrency prices. By utilizing historical price data along with relevant features such as trading volume, market capitalization, social media sentiment, and technical indicators, we aim to develop models that can provide insights into future price movements and trends. The use of ensemble methods like Random Forest and Gradient Boosting offers several advantages. These algorithms are capable of capturing complex relationships and non-linear patterns in the data. They can handle high-dimensional feature spaces and are less prone to overfitting compared to traditional regression models. Furthermore, they can incorporate feature importance analysis, which helps identify the most influential factors in cryptocurrency price prediction.

In this study, we will outline a framework for utilizing Random Forest and Gradient Boosting algorithms in cryptocurrency price prediction. We will discuss the data collection process, data preprocessing techniques, feature engineering methods, model selection, training, evaluation, and hyperparameter tuning. By following this framework, we aim to provide a foundation for developing robust and accurate cryptocurrency price prediction models.

LITERATURE SURVEY

[1] Rustgi N. Bitcoin Exchange QuadrigaCX Goes Bankrupt; Will Ernst and Young Be Able To Recover The Users' Assets?.[Internet]. Available from: https://coingape.com/quadrigacx-goes-bankrupt-ernst-young-recovery/

Big Four audit association Ernst & Young (EY) has argued that the now-shuttered Canadian crypto exchange Quadriga CX must be placed in bankruptcy instead of being restructured as part of ongoing creditor protection proceedings. EY proposed this course of action in its 'Fourth Report of the Monitor' filed with the Supreme Court of Nova Scotia on April 1.

As previously reported, Quadriga CX stated it had lost access to its cold wallet holdings following the death of its founder, Gerald Cotten, in December 2018 — Cotten having ostensibly been the sole person with access to the wallets' corresponding keys.

With the reportedly inaccessible crypto accounting for the considerable majority of the exchange's assets, Quadriga CX owes over $198.4 million to an estimated 115,000 users. Quadriga CX filed for creditor protection in early February, appointing EY as a monitor to the proceedings.

[2] Chong N. Fidelity Investments to Launch Bitcoin Trading For Institutional Clientele. [Internet]. Available from: https://blockonomi.com/fidelity-launch-bitcoin-trading-for-institutional-clientele/

A digital currency, Cryptocurrencies dealt on the web with no commodity cash as encryption strategies are used. That can be keep on the computer, besides any issues about both theft or loss, and doesn't spend any cash being produced and saved. It has now not simply the potential of charge and circulation as identical as that of gold or cash; excessive scale of fee like a actual property or a inventory as well. Due to transaction confidentiality, however, it can also be abused in tax evasions or in drug dealings. Cryptocurrency is designed to let the persons do freely economic dealings in P2P (peer to peer) way.

PROPOSED SYSTEM

In the proposed system, we aim to utilize Random Forest and Gradient Boosting algorithms for cryptocurrency price prediction. These machine learning algorithms have proven to be effective in handling complex and high-dimensional datasets, making them suitable for the volatile and unpredictable nature of cryptocurrency markets.

IMPLEMENTATION

[1] Dataset Upload & Analysis: using this module we will upload dataset and then perform analysis methods such as finding various crypto currency prediction and its count and then clean dataset by removing missing values.

[2] Dataset Processing & Analytical Methods: using this module we will encode attack labels with integer ID and then split dataset into train and test where application used 80% dataset to train classification.

[3] Run ML Model: using this module we will trained classification algorithm with above 80% dataset and then build a prediction model.

[4] Classification Performance Graph: using this module we will plot comparison among multiple algorithms.

[5] Predict Output: using this module we will upload test dataset and then classification model will predict output based on input data.
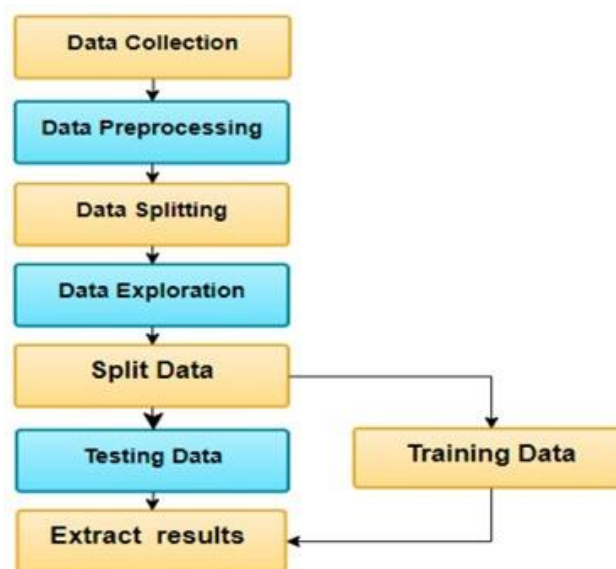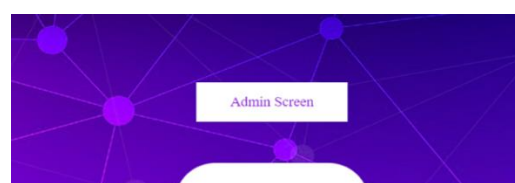

Fig -1: Figure

RESULTS AND DISCUSSION

Fig 2: Predict

The prediction values are taken as Open, High, Low, Close, Volume and after giving the values the currency is predicted and output is generated.

Fig 3: Predicted currency value

CONCLUSION

In conclusion, cryptocurrency price prediction is a challenging task due to the volatile and unpredictable nature of the crypto market. Machine learning algorithms, such as Random Forest and Gradient Boosting, offer promising avenues for predicting cryptocurrency prices. Through the proposed system, which includes data collection, preprocessing, feature engineering, model selection, training, evaluation, and hyperparameter tuning, these algorithms can be leveraged to generate insights and potential predictions.

However, it is essential to acknowledge the inherent limitations and challenges in cryptocurrency price prediction. The crypto market is influenced by various factors, including market sentiment, regulatory changes, and global events, making it highly unpredictable. Additionally, the presence of price manipulation and limited historical data further adds complexity to the prediction task.

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