BITCOIN PRICE PREDICTION USING MACHINE LEARNING ALGORITHMS

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ABSTRACT

In this paper we use machine learning algorithms to predict the value of bitcoin by forecast on the Bitcoin Price Using machine learning, or ML, a machine learning model is developed with algorithms to predict the price of bitcoin with the given other data of the factors that determine the direction of the bitcoin price such as the closing value , opening value , highest peak and so on that effect the price of the bitcoin from day to day . In this project we intend to not only predict the value of a bitcoin but also suggest the user whether the selling or buying of a bitcoin will bring them profits or not. Due to the implementation of tax deductions from income made from bitcoin investments and returns, bitcoin has recently hit a new height in its popularity. Being a form of virtual currency on the internet, bitcoin functions as both a payment method and digital asset. It is a favourite payment mechanism on the Internet since it enables anonymous payment between individuals. Due to its recent price increase, Bitcoin has recently attracted a lot of interest from the public and media. We may probably gain the knowledge we need to understand the future of crypto currencies by using machine learning models like the Random Forest Algorithm and Decision Tree Algorithm, both of which are also referred to as Classification Algorithms. It won't tell us what will happen in the future, but itmight indicate a broad trend and the way prices are likely to travel. The suggested methodology is to create a machine learning model, where the data is utilized to discover patterns in the dataset and the machine learning algorithm is used to forecast the price of bitcoin based on the biases that have a direct impact on it. Since this is just a prediction process and it cannot be relied on completely we suggest the user on complete study and investigation on bitcoin before implementing it , but with our project we try to predict the value to the most approximate value which the user can use as a suggestion to either buy , sell or keep the bitcoin . Random forest algorithm is one of the most strongest machine learning algorithm , we use this algorithm to solve the various conditions that need to be considered for predicting the bitcoin price , since the random forest algorithm consists of large numbers of decision tress this conditions can easily be checked and the value can be more accurately suggested and this our final goal through this project .

Keywords: Cryptocurrency , Random Forest and Decision Tree Algorithm.

Introduction

The most valuable crypto currency in the world, bitcoin, is traded on more than 40 exchanges across the world that accept over 30 different currencies .It currently has a market valuation of 9 billion USD and does more than 250,000 transactions daily. Since it is a relatively new currency and as a result has far higher volatility than fiat currencies, Bitcoin presents a novel possibility for price prediction. It is also distinct from conventional fiat currencies in terms of how open it is; with fiat currencies, there is no complete information on cash transactions or the amount of money in circulation. Many studies have been conducted on the subject of stock market prediction. As Bitcoin is a time series prediction problem in a market that is still in its infancy, this offers an intriguing analogy. Conventional time series prediction techniques, such Holt- Winters' exponential smoothing models, rely on linear hypotheses and demand data that may be divided into trend, seasonal, and noise. A task like predicting sales, when seasonal impacts are prevalent, is better suited for this type of research. These approaches are not particularly effective for this purpose because the Bitcoin market is highly volatile and lacks seasonality. Based on its performance in related fields and the

task's complexity, deep learning presents an intriguing technological answer. The purpose of this study is to examine parallelization techniques used in multi-core and GPU systems, as well as to determine how accurately the price of Bitcoin can be forecasted using machine learning. This essay offers the following contribution. For performance comparison considerations, an Random Forest is also created to make it easier to compare to more conventional financial forecasting methods.

2. LITERATURE SURVEY

The goal of this research is to examine parallelization methods used in multi-core and GPU systems as well as to find out how accurate machine learning forecasts of the price of Bitcoin may be. The following are the ways that this essay adds to the field: Of the approximately 653 publications published on Bitcoin, just 7(as of this writing) have anything to do with prediction utilizing machine learning. A Random Forest is also created with performance comparison goals in mind, making it possible to compare it to more traditional financial forecasting techniques.

3. EXISTING SYSTEM

To properly appreciate forecasting live's potency, it is necessary to examine traditional forecasting, which is where it all began. Conventional forecasting essentially makes predictions about future business parameters, such as inventory needs, budgets, revenue, and asset performance, based on historical observations. Due to the fact that the past does not always predict the future, conventional forecasting methods are ineffective. Machine learning uses a variety of algorithms, each of which has a unique working structure and set of assumptions. In these intuitions, models operate on various operations in various ways and also produce results with high and low accuracy. The main challenge is to develop a model for them such that accuracy is equal for all. We employed KNN and logistic regression in the current system, which produces less accuracy. Such models will not be able to meet our needs and will take additional time to develop.

4. DISADVANTAGES

Poor efficiency – Since prediction of bitcoin is quite a task it has never been the accurate results since the prediction process has a lot of conditions that needs to be checked and the previous methods did fail to do so , resulting in poor efficiency.

Time-consuming- The whole process is time consuming when the user had to manually check for the conditions rather than all at a single time .

High complexity- The processes previously implemented did result in high complexities as they could not provide with the most accurate results.

PROBLEM STATEMENT

In this project, we will estimate the price of bitcoin using machine learning algorithms. This will allow users to assess the pros and cons of buying or selling bitcoin. Recent publications state that the current bitcoin price prediction algorithm looks back into the past to anticipate future company KPIs like inventory needs, budgeting, etc, but Bitcoin's price is never constant and it hence requires day to day or time to time for accurate results and hence historical data or past data on the stock market data is useless and hence that didn't work out because, particularly in the business world, the past doesn't always predict the future. As a result, it is time-consuming, complex, and has a low efficiency rate has great complexities, and takes a lot of time. For the better forecast of bitcoin price prediction, we suggest a better approach that uses the current or the live business and budget as well as other live metrics to predict a more approximate price .

5. PROPOSED SYSTEM

The Bitcoin Price Index is the source of the price information. The implementation of a Bayesian-optimized recurrent neural network (RNN) and a Long Short Term Memory (LSTM) network results in varied degrees of success in completing the objective. According to studies, with 52% classification accuracy and an RMSE of 8%, the LSTM performs best. We are considering recommending this application because it helps to lessen the restrictions that Random Forest results. It can produce the best outcomes for attributes with no overlap by offering support through forecasting analysis, we are proposing the machine learning algorithms like the random forest algorithm as the data that needs to be considered and checked in order to predict a more accurate result or price is high and hence it would require large number of decision trees and hence random forest algorithm comes in hand. This method is more effective, less complicated, and takes less time than the previously used methods.

ADVANTAGES:

High efficiency – with the number of decision tress involved and the number conditions that will be checked in order to get the most accurate results, the efficiency is considered relatively high .

Time Saving – with all the conditions implemented together in the process it reduces the amount of time we put in to get the accurate values.

Inexpensive- it is considered way less expensive than the previous methods keeping in view the efforts and results ratios.

Low complexities- this process involves less complexities, with the number of decision trees involved there is less chances for it to have high complexities.

6. METHODLOGY

Random Forest

A random forest is a machine learning method for tackling classification and regression issues. It makes use of ensemble learning, a method that combines a number of classifiers to offer answers to challenging issues.

Many decision trees make up a random forest algorithm. The random forest algorithm trains its "forest" through bagging or bootstrap aggregating. An ensemble meta-algorithm called bagging increases the precision of machine learning algorithms.

Decision trees' predictions are used by the (random forest) algorithm to determine the outcome. It makes predictions by averaging or averaging out the results from different trees. The accuracy of the result is increased by adding more trees. The decision tree algorithm's drawbacks are removed by a random forest. It improves precision and decreases over fitting of datasets. Without many configurations in packages, it generates predictions.

Characteristics of a Random Forest Algorithm include:

• It is more accurate than a decision tree algorithm; • It offers a useful method for addressing missing data;

• It can make a good forecast without hyper-parameter tuning; • It resolves the problem of overfitting in decision trees.

• Each node's splitting point in a random forest tree randomly chooses a collection of features.

In our project we are creating a web application through which the user can actually access the predicting tool but first they will have to sign up and create their account in order to check, buy or sell their bitcoins. Initially after signing in, the user enters a dashboard of our application where the users profile can be seen, as in the bitcoins he owns and all his bitcoin related data. There the user can select either the buy or sell options according to his availability and clicks on predict, the price of the bitcoin at the moment would be displayed and also a quick few suggestions if the user is willing to take. The user after reviewing the bitcoin price can then do whatever that he thinks is better and can either sell, buy or keep his bitcoins. This program helps the user even if he doesn't have a clear knowledge on crypto currency as we try to provide him with accurate results that can eventually lead to profits if planned accordingly.

CONCLUSION

In conclusion, a high degree of accuracy may be achieved when predicting Bitcoin prices using machine learning algorithms. It's crucial to remember that the cryptocurrency market is extremely volatile and influenced by a wide range of unforeseen events, including legislative changes, security lapses, and consumer mood.

Machine learning models may not always fully represent the complexity of market dynamics, even while they can use a variety of data sources such as historical price data, trade volume, and social media sentiment.

As a result, it's crucial to exercise caution when relying on machine learning-based predictions of Bitcoin prices and to view them as one of several tools available to help investors make decisions. In the end, combining fundamental and technical research with a complete knowledge of market circumstances will aid investors in making more informed choices when it comes to purchasing Bitcoin or any other cryptocurrency.
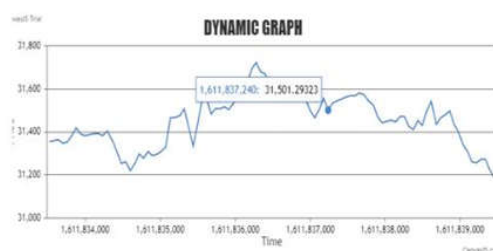

Fig: Dynamic Graph

FUTURE SCOPE

The capability to forecast future pricing can be added to this application. With the revised dataset, we intend to investigate the prediction process and employ the most precise and suitable forecasting techniques. We'll be concentrating a lot of our future effort on real-time live forecasting.

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