BITCOIN PRICE PREDICTION USING MACHINE LEARNING

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ABSTRACT

Several breakthroughs and developments have occurred in our rapidly expanding globe to suit the requirements of all people. As a result of technological advancements, the virtual currency was established in that race of evaluation. There are numerous methods for exchanging this virtual currency, including Ethereum, bitcoin, doge coin, lite-coin, tether, and so on. Bitcoin is a popular, safe, and reliable form of exchange. Here the goal is to see how well the direction of the Bitcoin price in USD can be predicted. The pricing information comes from the Bitcoin Price Index. Through implementation, the work is completed with varied degrees of success. The Random Forest performs the best in terms of classification accuracy. As a novel method of transaction systems, cryptocurrencies have caused a lot of investor bewilderment, and any rumors or news on social media have been alleged to have a substantial impact on the pricing of cryptocurrencies. It is a fascinating phenomenon that cannot be predicted and is taken into account in our work when there is a significant percentage increase or fall in the price of bitcoin within a short period of time.

Keyword-
Bitcoin, Bitcoin price prediction, Cryptocurrency, Investments, P2P transactions(Peer-to-Peer),

I. INTRODUCTION

Machine learning refers to a class of computer algorithms that can learn from examples and develop on their own without needing to be explicitly programmed by a person. Machine learning, a kind of synthetic intelligence, forecasts an output that might be utilized to provide insightful information using statistical techniques and real data. The mind, where all learning takes place, is a machine that learns. The computer learns inside in a similar way to how people do. People learn from their experiences. Our ability to forecast is higher the more we know. By analogy, when we are faced with an unknown event, our chances of finding fulfillment are lower than when we are faced with a known circumstance. To make a precise prediction, the machine views an example. The machine can forecast the result when we give it an analogous scenario. Nevertheless, if the machine is fed a case that has never been seen before, it struggles to predict, just like a human.

Bitcoin is a cryptocurrency that has been used for international online money transfers. Beginning in 2008, the bitcoin era entered widespread use in 2009. During the previous few years, growth has been consistent. There are no centralized authorities, such as banks or the government, in the world of bitcoins. Everyone with a shared interest in bitcoins, regardless of nationality, can access the proposed DIGICO web application.

Bitcoin is known as online money. Bitcoins can be used to conduct huge transactions quickly and without any hassles. Nowadays, the majority of people prefer to invest in bitcoins. Numerous platforms provide extensive information about bitcoins and their developments. The majority of earlier models were created utilizing algorithms such as RNN and LSTM. But, we used the random forest to draw the dynamic graph in addition to developing the DIGICO with a flask. As a result, the produced application will be lightweight and scalable, and the user will be able to quickly obtain current Bitcoin trends.

Bitcoin is a decentralized network in the sense that there is no central authority managing its supply or use, similar to how the Indian rupee is controlled by banks. Bitcoins have exceptionally secure transactions and control the creation of new units. It has no transactional borders because it runs on a worldwide peer-to-peer network, allowing you to transmit and receive data from anywhere. All Bitcoin transactions are recorded on a block chain, which is a network of computers that links and updates information every

second.NFT non fungible tokens, which are popular in the art sector, and DFD are two current bitcoin trends. Decentralized finance platforms, which allow consumers to access financial services without the use of traditional intermediaries, are also gaining popularity. We experienced difficulties such as market instability, regulatory changes, and complications. While machine learning has showed some promise in predicting bitcoin prices, it is vital to proceed with care and to examine a number of other aspects and data sources when making investing decisions.

They also employed artificial neural networks (ANN) and support vector machines (SVM) in prior research. To predict the price of bitcoins, recurrent neural networks (RNN) and long short-term memory networks (LSTM) are used. RNN and LSTM are computationally expensive, especially when training with large datasets. LSTM are difficult to train and this model needs to maintain information from the previous time, steps that make the optimum process difficult. Over fitting and computational complexity are downsides of using SVM and ANN. To address all of these shortcomings in our proposed systems.In this project, we will use a Random Forest machine learning method to predict the price of bitcoins, and we will create an application called DiGiCO. Using the random forest technique, many decision trees are created and their predictions are aggregated to produce a final outcome. The random forest algorithm can handle both continuous and categorical variables, allowing for feature selection and a better understanding of the correlations between characteristics and the goal variable. It can also overcome drawbacks such as the use of excessive computational complexity and over fitting.

II. LITERATURE SURVEY

The prior models were proposed using RNN and LSTM algorithms. Even in the existing literature, some models projected bitcoin prices [1–6]. One of the articles was created during the pandemic using random forest algorithms, and that model does not predict the future price of bitcoins [1]. In this study, we use machine learning techniques for the web application to forecast the price of Bitcoin based on past, present, and future data. The HTML, CSS, and Javascript languages were utilized in the web application, and the Flask module was used to design the back-end apps proposed.

They built time series using data sets for 30, 60, and 120 minutes in earlier works. They used GLM or random forest to generate three linear models from the datasets. These tree models are linearly coupled to forecast bitcoin prices [1]. The author examined the US stock market, according to [2]. The mean square deviation of the excess return is the result of his labor. He identified several financial and economic factors that have the potential to anticipate the market's excess return.

The writers have taken into account the patterns from the trends [3] rather than immediately predicting the future price of the stock. They made both short-term and long-term forecasts, and the report also discusses the network's performance evaluation methods, which is an interesting aspect. Multi-layer perception (MLP) and the nonlinear auto-regressive exogenous model (NARX) were compared in [4]. Even if MLP does not outperform the NARX model in price prediction, they conclude to the conclusion that it can be employed for stock market forecasting. To create and assess the performance of the network, the authors used a neural network toolbox.

The paper [5] proposes a model for the prediction of the time of series data based on the concept of a sliding window using the artificial neural network (ANN) technique, which is a radial basis function network. It depicts certain limitations, such as the introduction of hybrid or ensemble techniques with new ones.

The research work presented in [6] attempts to predict the Bitcoin price precisely, taking into consideration various constraints that affect the currency's value. The principal phase of the analysis aims to know and identify day-to-day fashions within the bitcoin marketplace while gaining perception into the best features surrounding the bitcoin price. The authors of [7] assert that bitcoin is the world's most valuable cryptocurrency and is traded on over 40 exchanges worldwide, accepting over 30 different currencies.

III. PROPOSED SYSTEM

Predicting the future will always be on the top of the list of uses for machine learning algorithms. Here in this project we have attempted to predict the prices of Bitcoin using Random Forest Classifier . This work focuses on the development of project based learning in the field of computer science engineering, by taking into account the problem definition, progression, assessment and use of hands on activities based on use of machine learning algorithm to develop application. In this system, we investigated machine learning technique based upon sample characteristics of sample and dimension to predict Bitcoin price. While most previous works simply leverage machine learning algorithms in Bitcoin price prediction, we show the feature dimensions that should be considered.

Random forest model use an ensemble of decision trees for various tasks to obtain a better classification result and are a popular approach. The use of decision trees is one of the basic machine learning methods and is used to solve a wide range of problems in classification. Decision trees adopt a tree structure to recursively partition the feature space, with each node continuing to split to maximize purity until the nodes only contain single class samples. These pure nodes are called leaf nodes. When a test sample is an input into a decision tree,it can be traced down to the leaf node and a class label can be assigned. By running a bootstrap aggregation (or bagging), a random subset of the whole feature space is assigned to the growth of each tree.Another interesting approach the paper reflects is the performance evaluation criteria of the network. Based on the predicted output the performance evaluation algorithm decides to either buy, sell or hold the stock with possible accuracy.

V . ARCHITECTURE

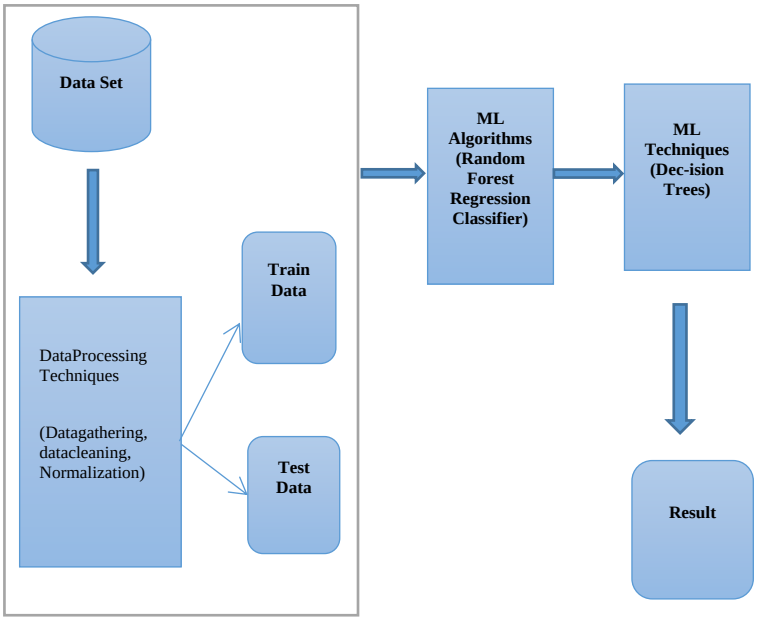

Fig 1 – System Architecture

Figure 1 explains about the architecture of entire system,where the dataset is taken and processed using different techniques.Later the dataset is trained, then tested.Random Forest Classifier algorithm along with decision trees are implemented in the system for predicting the result.

The architecture of the proposed application is depicted in the above below. We took a data set from Kaggle, and the retrieved dataset was cleaned and normalized so that we could clear the undesirable and repeated data before training the data set with the machine learning method. In machine learning, we utilize the Python programming language and a random forest technique to create decision trees and get correct results.

We utilize hypertext markup language (HTML) to construct web pages, and cascading style sheets (CSS) and JavaScript to describe style and layout. We used a Python web framework comprising background information and code comparisons for the project's subsequent development. The Flask framework includes tools, frameworks, and technologies for creating a web application.

VI . METHODOLOGY

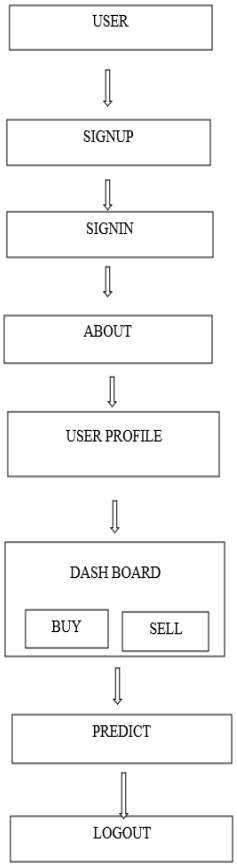

Fig 2:Flow Diagram

This flow diagram says us about the setp by step process that a user has to do for using the software created to predict the price of bitcoins.

The home page contains some basic Bitcoin details, and then we have a sign up page where personal details like name, email, and password, confirm the password, and coming to the sign-in page the user will log in to the website with a password that was set

during the sign up process, and from here the user can move to the desired task needed to perform such as viewing their profile, checking the bitcoin account, and going to the dashboard where they can know about the predictability. After that, users can see their transactions, and at the end, the user can see a dynamic graph and know the accuracy to purchase and sell bitcoin to make a profit.

VII . ALGORITHM

Random Forest:

Regression and classification problems are resolved using a machine-learning technique called a random forest. It employs ensemble learning, a technique that combines multiple classifiers to solve complex problems.

A random forest algorithm is made up of several decision trees. The random forest algorithm's 'forest' is trained via bagging or bootstrap aggregation. Bagging is a meta-algorithm that increases the accuracy of machine learning algorithms through an ensemble approach.Based on the predictions of the decision trees, the (random forest) set of rules determines the result. It makes predictions by averaging or averaging the results of different trees. The precision of the outcome improves as the number of trees grows.A random forest algorithm overcomes the constraints of the decision tree technique. It reduces dataset over fitting and improves precision. It generates forecasts without requiring extensive package parameters (like Sci-kit-learn).

VIII .IMPLEMENTATION

The proposed application comprises of pages like home, sign up & sign in, profile and dashboard. Home page is the page, where the execution of our work get started and the user can proceed to do the further work for enrolling his details and to know about the time to time changes of bitcoin frequencies.

VIII . RESULTS AND OUTPUTS

Fig 3: Home Page

When a user open the link provided for our website the home page will popup and that exactly look as the figure 3.

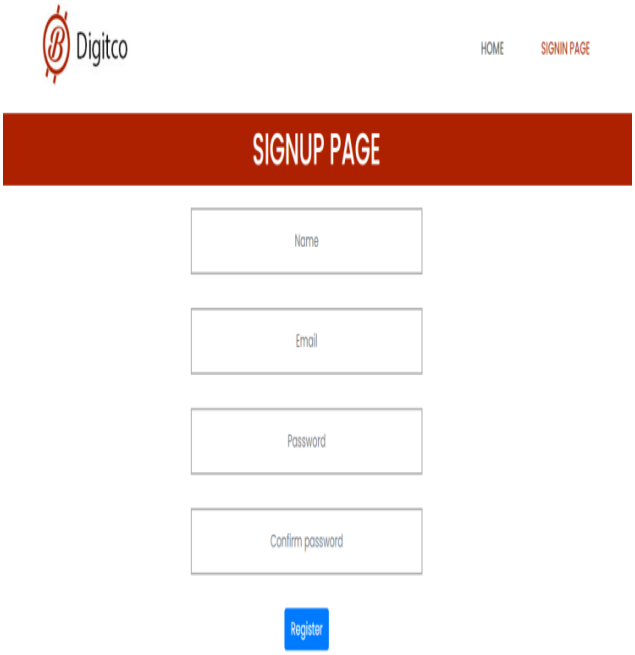

Fig 4:signup page

To use the resources present in our website one have to sign up by giving some information like name,email and by creating the password for security purpose.

Fig 5: sign-in page

After the sign-in process is done,user receive a mail regarding the registration confirmation and him/her can sign-up their account using the same mail and password.

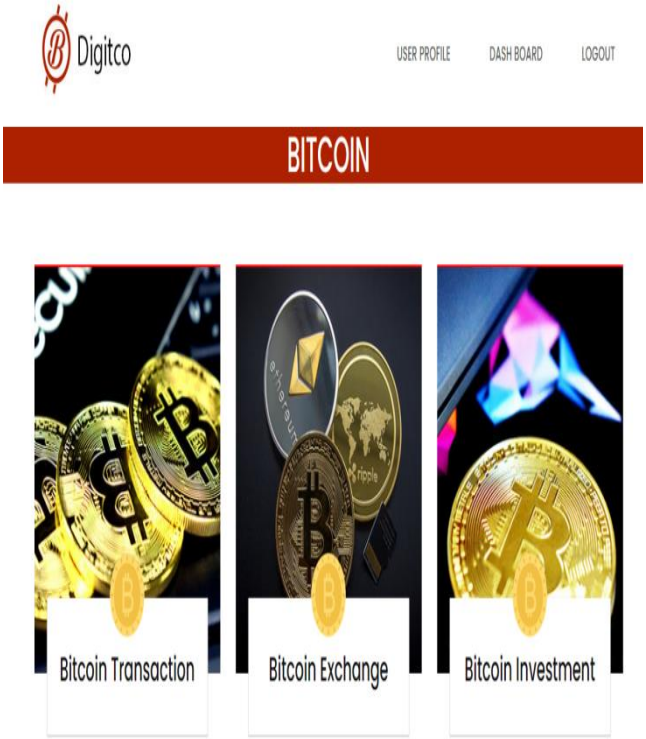

Fig 6: Main page

The main-page of the website appears as in the fig 6.

Here, we can see three options: user profile, dashboard, and logout page. When we click on each of these, it will display a distinct action. For example, when we click on the dashboard, we can see our complete information, including our name and email address.

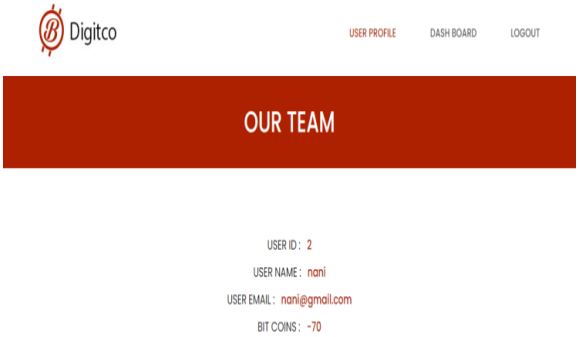

Fig 7:Profile page

Users can check about their transactions and personal details in this particular page.The profile page contains the user id, which is unique to each person, along with the person's name and email address, and it also has the specifics of the bitcoins, where they reflect the count of the bitcoins in both positive and negative amounts. If we buy Bitcoin right now, a positive sign signifies profit and a negative sign shows a loss. We will then proceed to the next phase, where we will see the dashboard.

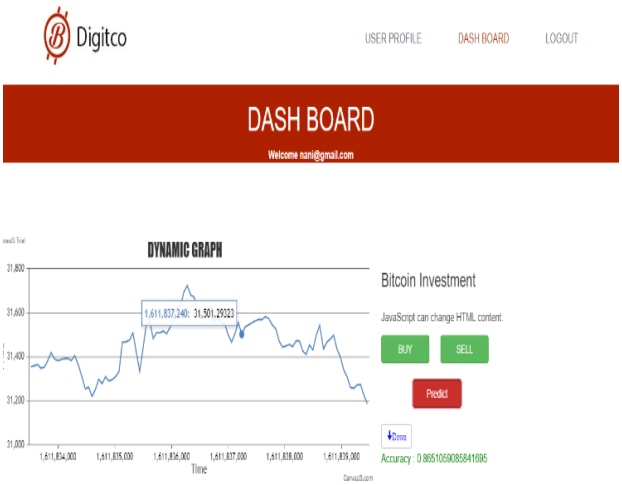

Fig 7:Dashboard

Figure 7 depicts a graph of the bitcoin price range, from which we can purchase, sell, and predict bitcoin prices, as well as evaluate the accuracy of bitcoin exchanges..

IX.CONCLUSION

Overall, predicting a price-related variable is challenging due to the numerous market factors at work. Add to that the fact that prices are heavily influenced by prospects rather than historical data. But, by employing machine learning algorithms and approaches, we have gained a greater understanding of Bitcoin. We have successfully constructed a model to generate future outcomes for the digital currency Bitcoin in our application. Python programming is used to create this in a user-friendly environment. Using the model, we can determine the bitcoin count and calculate the overall loss or gain while selling or holding bitcoin. Using this prediction model, one can quickly decide whether to hold, buy, or sell Bitcoin. Furthermore, a game-changing shift in peer-to-peer transactions is underway, revolutionizing the payment services market. While it appears that all doubts have not been resolved, the time may be right to act. We believe it is tough to provide a sophisticated thought on Bitcoin's future.

X. FUTURE ENHANCEMENT

This application can be extended to include the ability to predict the future prices. we plan to explore the prediction methodology using the updated dataset and use the most accurate and appropriate methods for forecasting. Real-time live forecasting will be one of the primary focus in our future work.Provide better user interface as people in crypto has doubled by huge margins in the last year. Implementing IOT model for smart automatic analysis will be the major constitutions in our future work

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