Cryptocurrency Price Prediction for Next 30 Days with Machine Learning

Dr. Guru Kesava Dasu Gopisetty [1], Ms.Mamillapalli Snigdha[2], Ms. Nagendla Manasa Reddy[3],

Ms.Mokkala Aswini[4], Ms. Mungamuri Kathyayani[5]

[1] *Professor, Dept. Information Technology, KKR & KSR Institute of Technology and Sciences, Guntur,India*

[2-5]*Student, Dept. Information Technology, KKR & KSR Institute of Technology and Sciences, Guntur, India*

---***---

Abstract - *The goal of this project is to create a model from machine learning that will predict cryptocurrency prices toward the following 30 days. The main goal is to build a prediction model that is able to predict future swings in prices for selected cryptocurrencies by using historical market data that encompasses price patterns, trading volumes, and appropriate indicators. The key objective of the model is to empower traders and investors functioning in the fluctuating and unpredictable the digital currency market to make well-informed decisions. Throughout every moment of the next 30 days, the model aims to give traders an advantage of strategy in maintaining the cryptocurrency ecosystem through provision of practical information.*

Key Words: *Cryptocurrency, Prediction, LTSM, Normalization, Features Extraction, Pediction Date*

1 .INTRODUCTION

The project entitled "Cryptocurrency Price Prediction for the Next 30 Days with Machine Learning," aims to develop an efficient machine learning model that predictions cryptocurrency exchange rates for thirty days. It takes forecasting to trade and invest in digital currencies because the market is volatile and continuously fluctuating. The markets for digital currencies have developed into dynamic ecosystems that have become recognized for their volatility and large profit possible outcomes. Predicting the price of cryptocurrency has grown to be an essential task for traders and investors exploring to make an utilization of market changes.

In an attempt to provide useful insights on likely price swings for particular cryptocurrencies, our model makes use of historical market data, which includes fluctuations of the prices, volumes that are traded, and other indicators. It will give market participants a forecasting technique that, through in-depth analysis and direction, enables them to make informed decisions among the erratic fluctuations of the digital currency market.

2. LITERATURE SURVEY

"Bitcoin Price Prediction using Machine Learning" This mostly focuses on making accurate price predictions for bitcoin by taking into account a variety of factors that affect its value. Over a five-year period, they look at aspects of the price and payment network of Bitcoin and study daily developments in the market. Their goal is to maximize the accuracy of their daily price change predictions by utilizing this data. To solve the challenge of predicting Bitcoin values, the authors want to apply the two previously described techniques after establishing the learning framework and normalizing the data. Their goal is to determine which of these approaches will work best for them in order to make precise predictions [1].

"Predicting the Price of Bitcoin Using Machine Learning" It investigates the degree of accuracy in predicting the direction of Bitcoin's USD price. Using deep learning models, namely a longshort-term memory (LSTM) network and a recurrent neural network (RNN), the researchers discover that the LSTM gets the maximum accuracy of 52%. They also provide a comparison between these models and the ARIMA model, which does not fare well. They also discover that using a GPU for deep learning model training outpaces using a CPU [2].

"Cryptocurrency Price Prediction Using Machine Learning" A cryptocurrency is a type of digital money in which the issuance of new units is managed by encryption mechanisms. In order to anticipate the price of bitcoin, this article looks into the best recurrent neural networks (RNN) and long-short-term memory (LSTM). The success rate of predicting changes in the price of bitcoin using these state-of-the-art machine learning algorithms varies [3].

"Bitcoin Price Prediction Based on Other Cryptocurrencies Using Machine Learning and Time Series Analysis" A wide range of approaches, including time series analysis, neural networks, and machine learning, are covered in the subject matter. Zcash outperformed Ethereum and Litecoin in terms of forecasting the values of the other three well-known cryptocurrencies[4].

"Performance Evaluation of Machine Learning Algorithms for Bitcoin Price Prediction" For the purpose of explaining the value of bitcoin, the study included recurrent neural networks, long short-term memory (LSTM), and linear regression (LR). Predicting Bitcoin value and accomplishing better predictions than the regression model was the RNN model with LSTM's capacity to recognize long-term dependencies [5].

"Bitcoin Price Prediction using Machine Learning" The writers were looking to offer an accurate estimation of Bitcoin's price by accounting for a wide range of factors that impact its worth. They apply surveys to look at regular market patterns and identify the key elements that influence the value of Bitcoin. The information gathered is used in the second stage to provide the most precise estimate of the daily price increases or decreases. Trying to determine the probability of machine learning techniques for upcoming forecasting—particularly with reference to the approximated data of Bitcoin prices—was the aim of the study [6].

"Crypto-Currency Price Prediction Using Machine Learning Techniques" Examining many factors, a study investigates how to predict the price of bitcoin with high accuracy. First, you look at the daily fluctuations and acquire the basic elements that determine the market's value. After that, machine learning methods such as Lasso, decision trees, and linear regression are applied to the supplied data in order to precisely anticipate changes in regular prices [7].

"ETHEREUM PRICE PREDICTION USING MACHINE LEARNING TECHNIQUES: A COMPARATIVE STUDY" Three distinct machine learning models have been investigated in the study: RNNs, LSTMs, and bi-LSTMs. A dataset of closing market prices for Ethereum for the previous two thousand days is used to forecast price patterns for short (30-day) as well as long (90-day) schedules. For speculation, the bidirectional LSTM methodology works best, as opposed to the RNN, LSTM, it, and bi-LSTM. The retail cost of Ethereum, as determined by the suggested model's analysis of numerous price projections, Using the close of the market as a guide, such an approach yields predictable movements across longer timeframes, especially ninety days. Further enhancements to the expandable model are feasible with the incorporation of new parameters and alterations to hyperparameters [8].

"A Novel Approach for Analyzing and Predicting Bitcoin Price Using Machine Learning" Due to its anonymity feature, Bitcoin is a digital currency that is widely used for illicit online activity. The goal of this project is to use machine learning models to forecast the trajectory of bitcoin values. These models use past data analysis to spot trends and offer insights into possible movements in bitcoin values, even though they are not able to forecast the future with absolute certainty [9].

"Predicting Price Changes in Ethereum" Using techniques including logistic regression, naive bayes, support vector machines, random forest, and ARIMA, the paper explains and compares a number of machine learning models to forecast the prices of Ethereum. The research discovered that ARIMA produced time series projections that were more accurate than those from other machine learning models [10].

"Bitcoin price prediction using machine learning: An approach to sample dimension engineering" Within the provided framework, the writers talk about how they forecast Bitcoin values using machine learning techniques for 5-minute time intervals price prediction and statistical techniques for the daily cost prediction. They discover that while machine learning models beat conventional statistical techniques for high-frequency data, computational methods perform better for those data with dimensional in nature characteristics. Although they accept the limitations of the data sources and analysis, the authors argue that their methodology can be extended to other sectors with features comparable to Bitcoin. They also recommend future extensions to the analysis [11].

"Machine Learning Models Comparison for Bitcoin Price Prediction"The GRU model demonstrated to be the one that is most precise in predicting Bitcoin prices, according to the results of their models that were put into In reality. It did, however, take longer to compute than the Huber regression model. It is crucial that one keeps in mind that an assortment of external factors, like social media sentiment, regulations regarding to digital currency, and policies, may make it impossible for the models' chosen features—open, close, high, and low prices—to reliably anticipate Bitcoin values. It is advised that datasets should be modified and data collected constant to get the best results [12].

"BITCOIN PRICE PREDICTION USING MACHINE LEARNING" It makes it hard to predict the valuation of Bitcoin because of many variables at work in the market and the fact that past data is not as reliable as future potential. But our knowledge of Bitcoin has improved because to the application of neural network technology, particularly LSTM architecture. To improve prediction accuracy, ongoing work entails performing hyperparameter tweaking and taking into account more data, like microeconomic aspects [13].

"Systematic Erudition of Bitcoin Price Prediction using Machine Learning Techniques" It provides information about how special the Bitcoin system is and how price volatility must be maintained. It evaluates the use of a number of methods to forecast Bitcoin values, identifying the method called NARX as the most reliable. The study indicates potential for contributing to investors in making adequately informed selections and advocates some further study to enhance Bitcoin price forecasting techniques [14].

"Forecasting of Cryptocurrency Values using Machine Learning" Using stock market data from Yahoo Finance, the recommendation was made that had the capacity to accurately estimate bitcoin prices. The model can generate consequences and predict changes in price in the bitcoin market by making use of time-series techniques. despite the fact LSTM is an asset for estimating bitcoin parameters, it is not sufficient for making investment decisions on its own because other factors, such as political and economic crises, influence as well stock markets. To gain more insight into the impacts of bitcoin price uncertainty, future studies are going to examine dropout, iterations, and LSTM layer adjustments in addition to the addition of numerous volatility datasets and sentiment analysis techniques. [15].

3. PROPOSED SYSTEM

The reason of the solution suggested is For producing an effective model for machine learning for a digital currency price prediction with the ultimate goal to observe traders and investors find an unforeseeable and uncertain the cryptocurrency marketplace. The system focuses a model for forecasting how that can anticipate the future price fluctuations for a subsection of a digital currency through utilizing past information about the marketplace, that contains pattern of prices, the trade volume, and other indicators.

Users can decide the cryptocurrency of importance and amount of intervals for prediction by executing the application's efficient Streamlit-powered the user experience. After receiving responses from the user, the process that gets historical a digital currency data and preprocesses it, taking out specifications like volume, open, high, and low prices, and also percentage modification.

From two LSTM layers and then a layer that is dense for prediction, the LSTM model framework is planned. By adopting the mean squared error loss mechanisms and the Adam optimizer, the model is assembled. It models the patterns as well as connections in the data by going through training for an assigned amount as well as epochs and batch size.

In the end, the system shows the user the results, including the name of the chosen cryptocurrency, its beginning price, its expected price after a given number of days, and the associated forecast its result (profit, loss, or no change). By providing consumers with insightful information, our all-inclusive prediction system enables them to make well-informed judgments in the digital currency market.

3.1 PROBLEM DEFINITION

The project entails the development of a machine learning model for Cryptocurrency Price Prediction. The primary objective is to leverage historical market data, including price trends, trading volumes, and relevant indicators, To construct a predictive model capable of forecasting future price movements for selected cryptocurrencies. The model should facilitate informed decision-making for investors and traders in the dynamic and volatile cryptocurrency market.
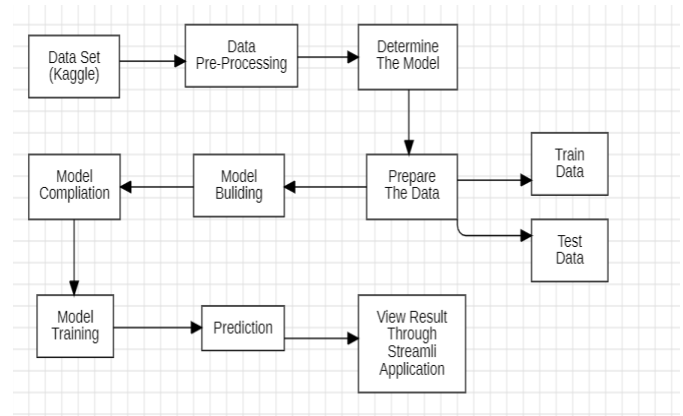
3.2 WORKFLOW

Fig 1 Represents the Workflow of project

3.3 IMPLEMENTATAION METHODS

1. In the initial phase we take up the collected information from a CSV file that contains the digital currencies data. This is known as data loading and preprocessing. separating distinct cryptocurrency names from the data refers to how we preprocess it.

2. The process of making predictions entails acquiring the data for the have chosen cryptocurrency once it is prompted. Certain aspects are extracted, include opening, high, low, volume, and % change. Using Min-Max scaling, data is normalized. An LSTM model fit is exceeded by refining the data.

3. Building Models: A Sequential Keras design is built by yourselves. A tandem of 50-unit LSTM layers are incorporated. To the output, a Dense layer is carried out.

4. The model is compiled by the Adam optimizer, which and the mean squared error losses function.

5. The next steps are training and model compilation. It comes 32 batch sizes and 100 epochs of training on the training set.

6. Speculation: The cryptocurrency's initial price is identified. The deadline in the analysis and the maximum amount of prediction days entered by the user are used to determine the prediction date. The latest scaled features are used to prepare illustrates for prediction. After an identified number of days, the price can be estimated by the model. Then Display results.

4. RESULT ANALYSIS

Based on behind market data, the cryptocurrency predictions of prices method accurately forecasts the chosen coin's future price. The system obtains the data that was required, begins processing it, and the trains an LSTM neural network model when the user enters the name of the cryptocurrency and the number of prediction days. Following training, the model forecasts the cryptocurrency's price with accuracy for the given a future moment.

The user is presented with the following findings by the system:

Name of Cryptocurrency: The choice for cryptocurrency's name.
Starting Price: The cryptocurrency's starting price determined by past data.
After {prediction_days}, the predicted price Days: The cryptocurrency's expected price after the given number of days.
Prediction: Shows whether the expected price points to a gain, a loss, or no change at all.
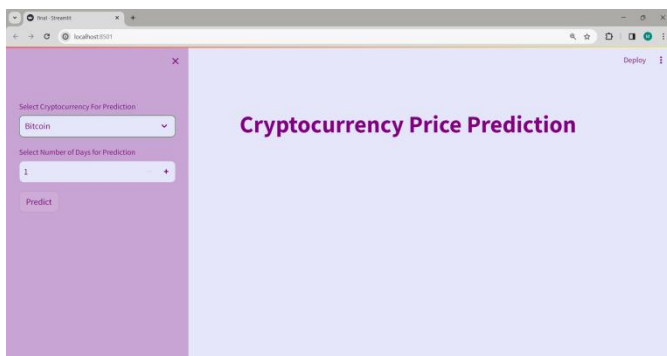
Selection of Cryptocurrency

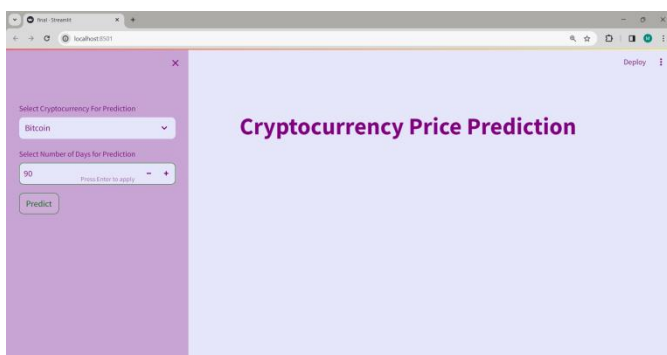**Fig 2 Selection of Cryptocurrency**

Selection of Days to Predict

Fig 3 Selection of Days
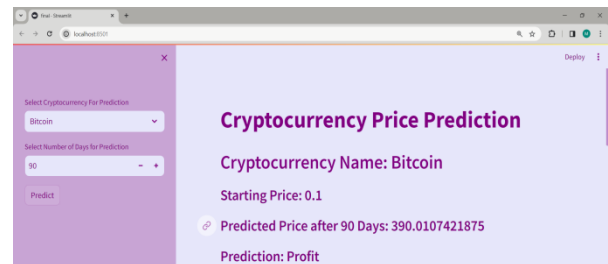
Final Prediction:-

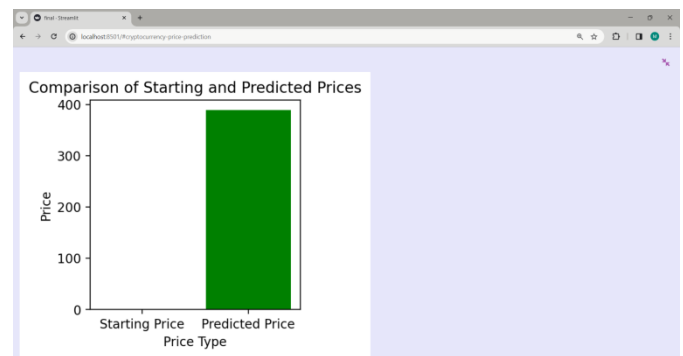**Fig 4 Result of Prediction of Cryptocurrency**

BAR GRAPH

Fig 5 Bar Graph for starting and predicted prices
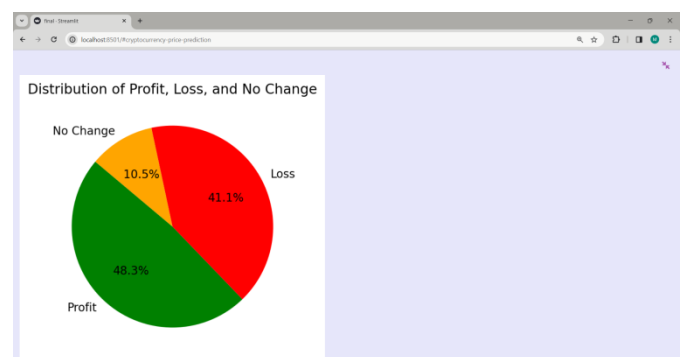
Pie Chart

Fig 6 Pie Chart for Profit, loss and No change

5. CONCLUSION

In an unpredictable and uncooperative cryptocurrency market, the developed price prediction system for cryptocurrencies shares traders and investors a useful tool for making well-informed decisions. Techniques helps users govern concerns and to generate profitable methods for trading by providing up to date price predictions for the future as well based on earlier in market data and machine

learning algorithms. It's absolutely essential to be remembered that predictions may not always come true because the digital currencies markets are fundamentally unpredictable. Sustainability the model's the efficiency over time requires ongoing observation, assessment, and improvement. In general, the system is a key instrument for managing how complex involved in investors and traders interact in cryptocurrencies.

6. REFERENCES

[1] Siddhi Velankar, Sakshi Valecha, Shreya Maji," Bitcoin Price Prediction using Machine Learning",International Conference on Advanced Communications Technology(ICACT),pp.144- 147, February 2018.

[2] S. McNally, J. Roche ,S. Caton, "Predicting the Price of Bitcoin Using Machine Learning" 26th Euromicro International Conference on Parallel, Distributed and Network-based Processing , DOI10.1109/PDP2018 .2018.00060 ,pp. 339-343,2018.

[3]K.Ramya Laxmi.,MarriAbhinandhanReddy, CH. Shivasai, P. Sandeep Reddy."Cryptocurrency Price Prediction Using Machine Learning",SAMRIDDHI Volume 12, Special Issue 3, pp.12- 15,2020

[4]Maleki, N., Nikoubin, A., Rabbani, M., Zeinali, Y, "Bitcoin Price Prediction Based on Other Cryptocurrencies Using Machine Learning and Time Series Analysis",Scientia Iranica, pp.285- 301,2020.

[5]H. Kavitha, U. K. Sinha and S. S. Jain, "Performance Evaluation of Machine Learning Algorithms for Bitcoin Price Prediction," 2020 Fourth International Conference on Inventive Systems and Control (ICISC), pp.110-114,2020.

[6] Shivam Pandey, Anil Chavan,Dhanashree Paraskar, Sareen Deore," Bitcoin Price Prediction using Machine Learning", International Research Journal of Engineering and Technology (IRJET), Volume 08 , Issue 05,pp.2136-2139, May 2021.

[7] U Raghavendra Swamy, D Rupini, G Shravya, V Akhila."Crypto-Currency Price Prediction Using Machine Learning Techniques", JETIR , Volume 8, Issue 6,pp.212-215,june 2021.

[8] Monish S, Mridul Mohta, Shanta Rangaswamy," ETHEREUM PRICE PREDICTION USING MACHINE LEARNING TECHNIQUES – A COMPARATIVE STUDY", International Journal of Engineering Applied Sciences and Technology(IJEAST), Volume 7, Issue 2,pp.137- 142, June 2022.

[9] K. Pazhanivel , T. Arasu, S. Hariharasudhan," A Novel Approach for Analyze and Prediction of Bitcoin Price using Machine Learning", International Journal of Advanced Research in Science, Communication and Technology (IJARSCT), Volume 2, Issue 1,pp.439-440, , June 2022.

[10] Chen, Matthew and N. Narwal."Predicting Price Changes in Ethereum", 2017.

[11]Zheshi Chen,Chunhong Li,Wenjun Sun,"Bitcoin price prediction using machine learning: An approach to sample dimension engineering",Journal of Computational and AppliedMathematics(ELSEVIER),https://doi.org/10.1016/j.cam.2019.112395 ,pp.1-13,2019.

[12]Thearasak Phaladisailoed,Thanisa Numnonda,"Machine Learning Models Comparison for Bitcoin Price Prediction",International Conference on Information Technology and Electrical Engineering (ICITEE),DOI:978-1-5386-4739-4/18/2018,pp.506-511.

[13] Vaidehi M, Alivia Pandit, Bhaskar Jindal, Minu Kumari,Rupali Singh"BITCOIN PRICE PREDICTION USING MACHINE LEARNING",International Journal of Engineering Technologies and Management Research,pp.20–28,May 2021.

[14]Prachi Vivek Rane,Sudhir N. Dhage,"Systematic Erudition of Bitcoin Price Prediction using Machine Learning Techniques",International Conference on Advanced Computing & Communication Systems (ICACCS)",DOI:978-1-5386-9533-3/19/2019,pp.594-598,2019.

[15] Ashmit K. Khobragade, Omkar C. Keskar, Prathamesh G. Deshmukh, Dr. Rupali M. Chopade,"Forecasting of Cryptocurrency Values using Machine Learning",International Journal for Research in Applied Science & Engineering Technology (IJRASET) ,Volume 10 ,pp.2729- 2732 May 2022