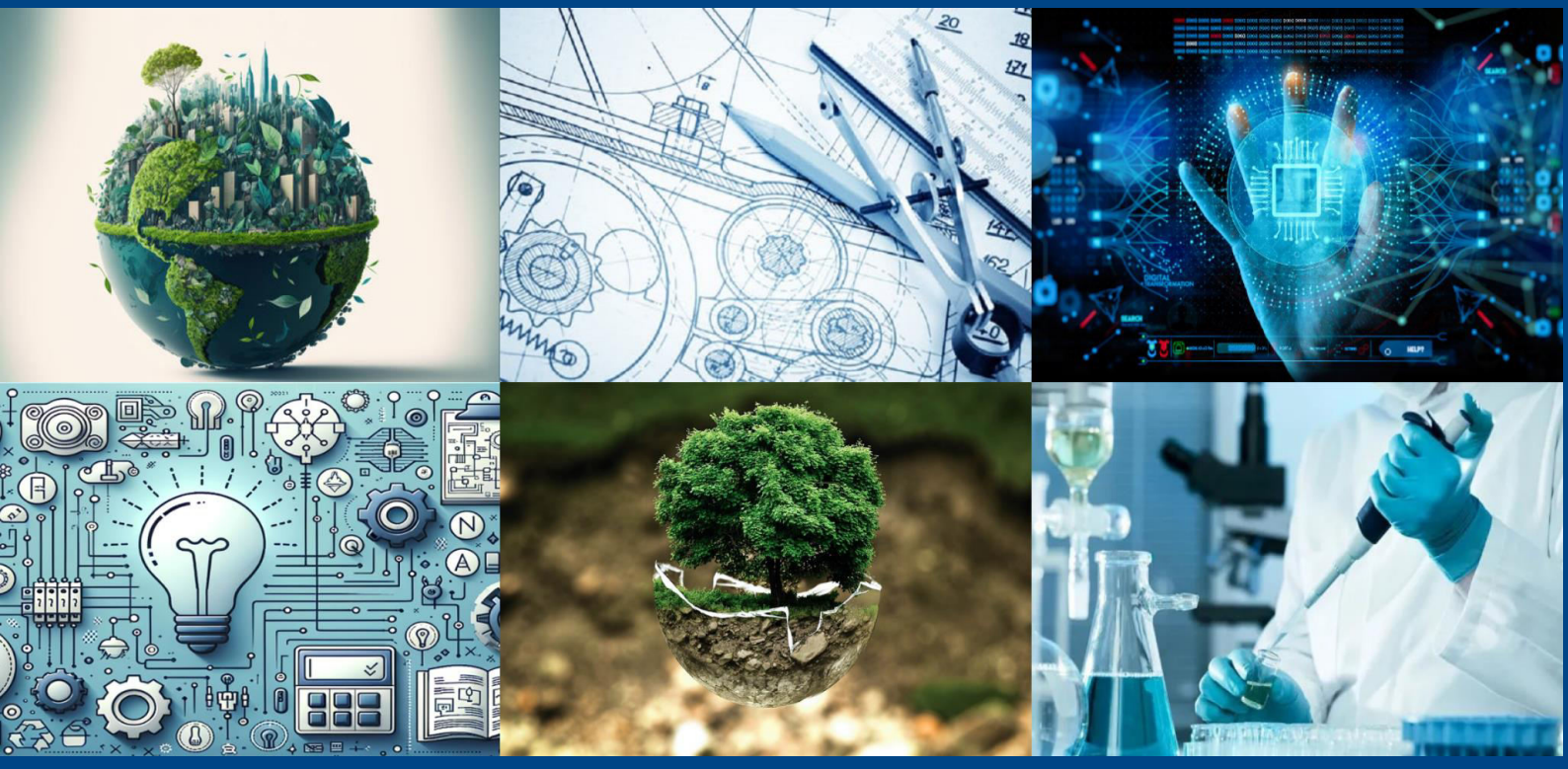
ISSN: 2582-7219

International Journal of Multidisciplinary Research in Science, Engineering and Technology

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.206 **Volume 8, Issue 5, May 2025**

© 2025 IJMRSET | Volume 8, Issue 5, May 2025| DOI:10.15680/IJMRSET.2025.0805150

ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| ESTD Year: 2018|

International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Forecasting and Trading of the Stable Cryptocurrencies with Machine Learning and Deep Learning Algorithms for Market Conditions

D.Prabhakaran, E.Manikandan

Assistant Professor Dept. of MCA, Gnanamani College of Technology, Namakkal, Tamilnadu, India

PG Student, Dept. of MCA, Gnanamani College of Technology, Namakkal, Tamilnadu, India

ABSTRACT: Virtual currencies have been declared as one of the financial assets that are widely recognized as exchange currencies. The cryptocurrency trades caught the attention of investors as cryptocurrencies can be considered as highly profitable investments. To predict Cryptocurrency price at different frequencies using machine learning techniques, we first classify Cryptocurrency price by daily price and high-frequency price. A set of high-dimension features including property and network, trading and market, attention and gold spot price are used for Cryptocurrency daily price prediction, while the basic trading features acquired from a cryptocurrency exchange are used for 5-minute interval price prediction In today's world we can see the trend of cryptocurrency is constantly increasing every day. In the financial sector, cryptocurrency has become a huge topic and the right prediction has become more important to gain profits. For determining the right prediction with good accuracy, we performed deep analysis on dataset to understand the market behaviour by using LSTM machine learning algorithms like to predict the daily price behaviour of top 4 cryptocurrencies like Bitcoin, XRP, Ethereum, and Stellar using these machine learning algorithms. Our experimental result reaches to 95–97 percent validation accuracy.

KEYWORDS: Block chain**,***Cryptocurrency,Crypto Exchange,Digital Marketing,Digital Wallet,Metaversa,*

I. INTRODUCTION

A Bitcoin: Bitcoin uses a peer-to-peer technology to operate with no central authority or banks. Bitcoin is open-source; its design is public, nobody owns or controls Bitcoin and everyone can take part. Digital currency bring into use as open source software in 2009 by pseudonymous creator Satoshi Nakamoto It is a cryptocurrency, so-called because it uses cryptography to control the creation and transfer of money. Users send payments by broadcasting digitally signed messages to the network. Participants known as miners verify and timestamp transactions into a shared public database called the blockchain, for which they are rewarded with transaction fees and newly minted bitcoins. Conventionally "Bitcoin" capitalized refers to the technology and network whereas "bitcoins" lowercase refers to the currency itself. Bitcoins can be obtained by mining or in exchange for products, services, or other currencies.

B. Prediction : The Bitcoin's value varies just like any other stock . There are many algorithms used on stock market data for price forecast. However, the parameters affecting Bitcoin are different. Therefore it is necessary to foretelling the value of Bitcoin so that correct investment decisions can be made. The price of Bitcoin does not depend on the business events or intervening government authorities, unlike the stock market. Thus, to forecast the value we feel it is necessary to leverage machine learning[6][7] technology to predict the price of Bitcoin.

Machine Learning: Machine learning is an application of Artificial Intelligence (AI) that provides the program that developed by the programmers an ability to automatically improve and learn from time to time. It only focuses on the development of computer programs that can access data and learn it themselves. The process of learning begins with the observation of data like a direct instruction or experience that provide by developer in order to look for patterns in data and make a better decision in the future. The main aim is to allow the computers to learn automatically without human intervention or assistance and actions accordingly.Machine learning algorithms are been categorized as supervised or unsupervised.It can apply in what has been learned in the past to new data using labelled that provided to predict the future events. From the analysis which is known as training dataset, the learning algorithm produces an inferred function to make predictions the output values that we requested. The system is able to provide targets for any new input by the users after sufficient training. It also compares the output with the correct, intended output and find

© 2025 IJMRSET | Volume 8, Issue 5, May 2025| DOI:10.15680/IJMRSET.2025.0805150

ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| ESTD Year: 2018|

International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

errors in order to modify the model accordingly. It can apply when the information is used to train neither to classify nor labelled. It also can study how the system can input a function to describe a hidden structure such as some text in s message that known as labelled data. The system does not figure out the right output but it can explore the data and draw the inferences from datasets to describe hidden data.

II. LITERATURE SURVEY

1. FORECASTING AND TRADING OF THE STABLE CRYPTOCURRENCIES WITH MACHINE LEARNING AND DEEP LEARNING ALGORITHMS FOR MARKET CONDITIONS

The digital market trend is rapidly expanding due to key characteristics like decentralization, accessibility, and market diversity enabled by blockchain technology. This study proposes a Predictive Analytics System to provide simplified reporting for the three most popular cryptocurrencies with varying digits, namely ADA Cardano, Ethereum, and Binance coin, for ten days to contribute to this emerging technology. Thus, this proposed system employs a data science-based framework and six highly advanced data-driven Machine learning and Deep learning algorithms: Support Vector Regressor, Auto-Regressive Integrated Moving Average (ARIMA), Facebook Prophet, Unidirectional LSTM, Bidirectional LSTM, Stacked LSTM. Moreover, the research experiments are repeated several times to achieve the best results by employing hyperparameter tuning of each algorithm.

2.TESTING

White-box testing (also known as **clear box testing**, **glass box testing**, **transparent box testing**, and **structural testing**) is a method of testing software that tests internal structures or workings of an application, as opposed to its functionality (i.e. black-box testing). In white-box testing an internal perspective of the system, as well as programming skills, are used to design test cases. The tester chooses inputs to exercise paths through the code and determine the appropriate outputs. This is analogous to testing nodes in a circuit, e.g. in-circuit testing (ICT).
While white-box testing can be applied at the unit, integration and system levels of the software testing process, it is usually done at the unit level. It can test paths within a unit, paths between units during integration, and between subsystems during a system–level test. Though this method of test design can uncover many errors or problems, it might not detect unimplemented parts of the specification or missing requirements.

White-box test design techniques include:

- Control flow testing
- Data flow testing
- Branch testing
- Path testing
- Statement coverage
- Decision coverage

3. MODULES

Data Representation The used data set is a history of Bitcoin prices per minute from March 1st, 2020 to April 1st, 2020. That is to say, there are 129316 data samples. Each of them has the associated timestamp and Bitcoin price information. For this work, several fields are ignored, starting with the timestamp, since the interval is constant and it is enough knowing the order of the data, being redundant. The lowest and highest value of the minute are not considered for simplicity; there are close in value and somewhat redundant to the weighted price, which is the prediction target. The opening and closing values are also ignored for the same reason as the previous fields. That is, the only value to consider is the weighted price, which can be conceptually seen as the average price of the Bitcoin (in United States dollars, USD), for each minute.

4. DATA PRE-PROCESSING

The data has been normalized using a minimum-maximum scaler, that is, translating the whole set of price values to the range 0-1, by assigning 0 to the lowest original value, 1 to the highest, and a linear equivalent to

© 2025 IJMRSET | Volume 8, Issue 5, May 2025| DOI:10.15680/IJMRSET.2025.0805150

ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| ESTD Year: 2018|

International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

the rest of values, lying in between the extremes. Once the scaler has been fitted to the data, it can be used after producing the model to invert the transformation on the predicted values, to recover the original ranges of values for the predictions. The reason to normalize the data is to help the RNN and specifically back-propagation and gradient descent learn faster by reducing the magnitude of the value search space.

As previously mentioned, the data is composed of 1293167 instances. The decision of how to split the data was taken trying to both have a large percentage of the data to learn (the more data, the more a model can opt to learn) and to keep a reasonably long and heterogeneous sample as the test one. Therefore, the model was trained with the first 120000 instances (92.2% of the data), while the remaining 9316 (7.8%) were used as a test. They correspond to a period of time, during the first half of 2020, with large, fast changes in the value of the Bitcoin, which make the prediction task really challenging.

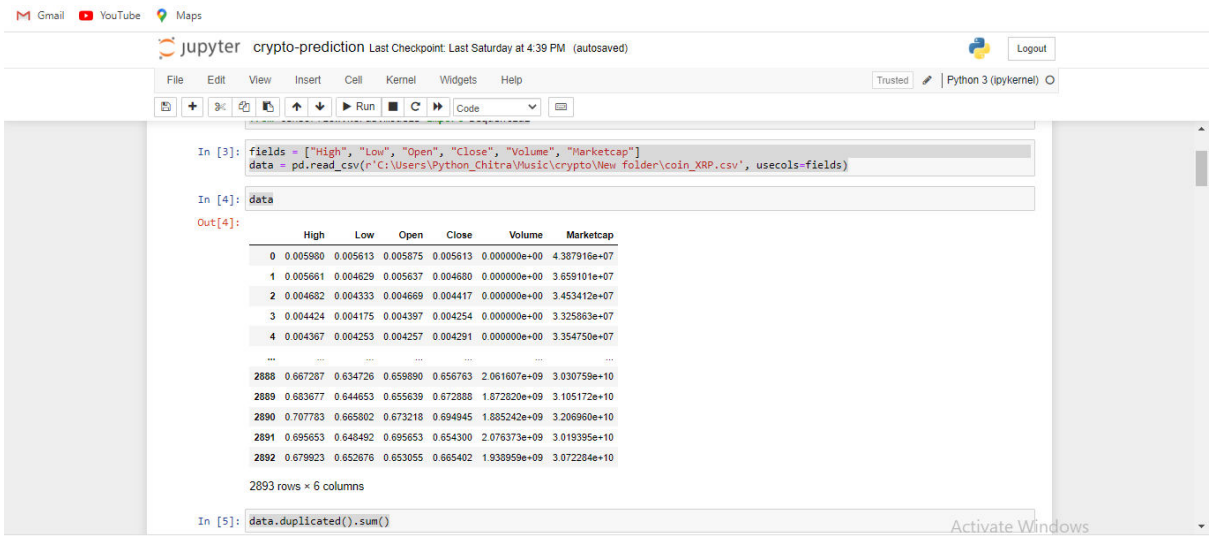
5. SYSTEM TESTING

System testing of software or hardware is testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. System testing falls within the scope of black box testing, and as such, should require no knowledge of the inner design of the code or logic.

System testing is performed on the entire system in the context of a Functional Requirement Specification(s) (FRS) and/or a System Requirement Specification (SRS). System testing tests not only the design, but also the behavior and even the believed expectations of the customer. It is also intended to test up to and beyond the bounds defined in the software/hardware requirements specification

- Graphical user interface testing
- Usability testing
- Software performance testing
- Compatibility testing
- Exception handling
- Load testing
- Volume testing
- Security testing

III. RESULT AND DISCUSSION

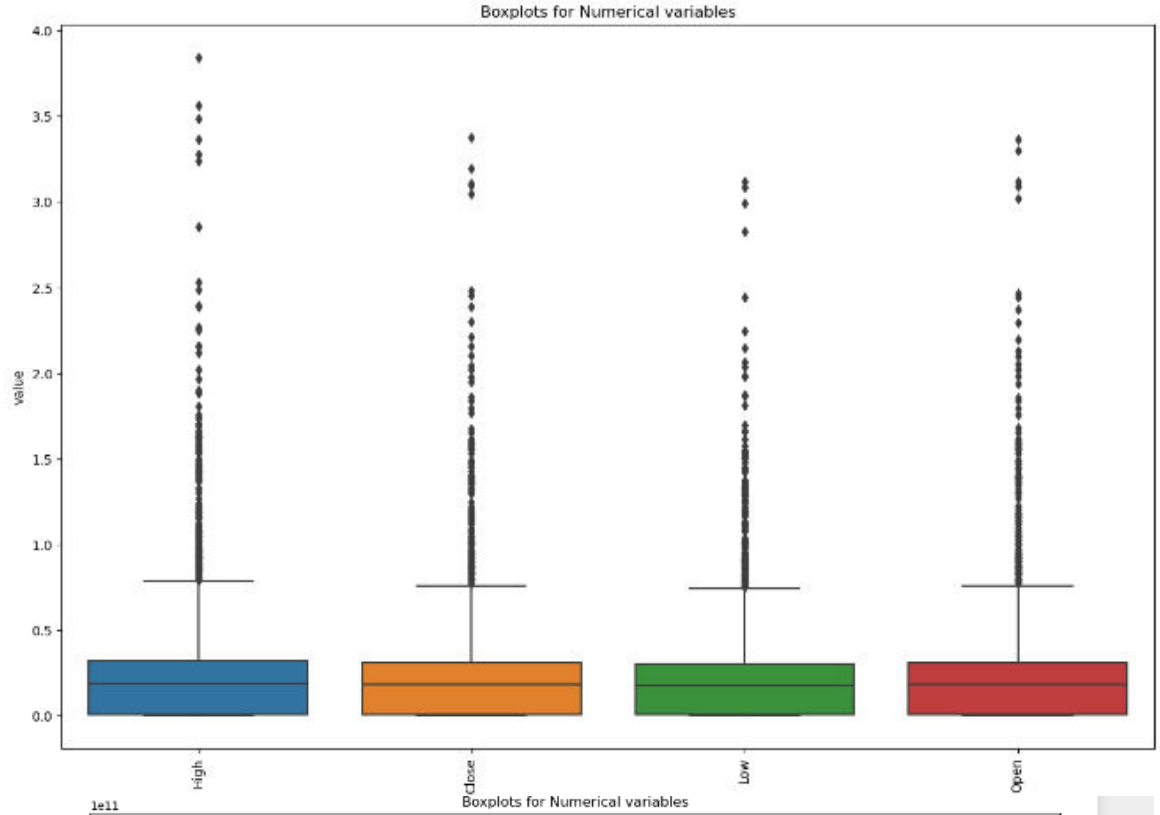


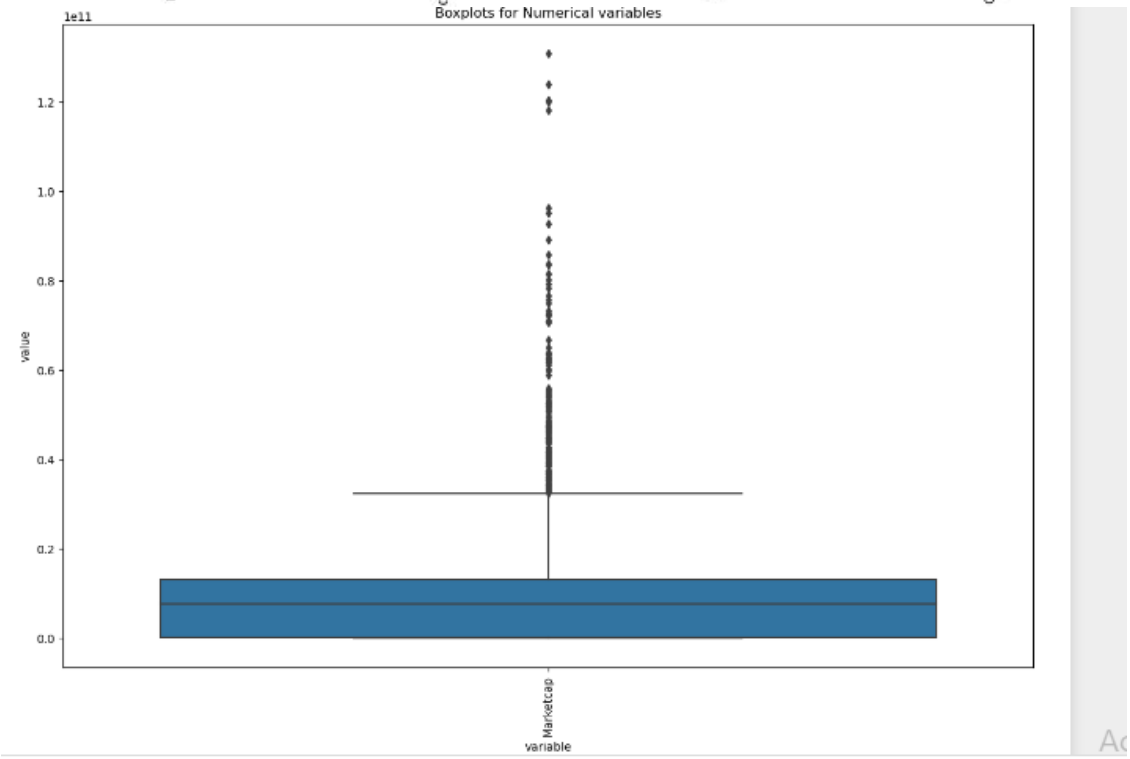
© 2025 IJMRSET | Volume 8, Issue 5, May 2025| DOI:10.15680/IJMRSET.2025.0805150

ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| ESTD Year: 2018|

International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)





© 2025 IJMRSET | Volume 8, Issue 5, May 2025| DOI:10.15680/IJMRSET.2025.0805150

ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| ESTD Year: 2018|

International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

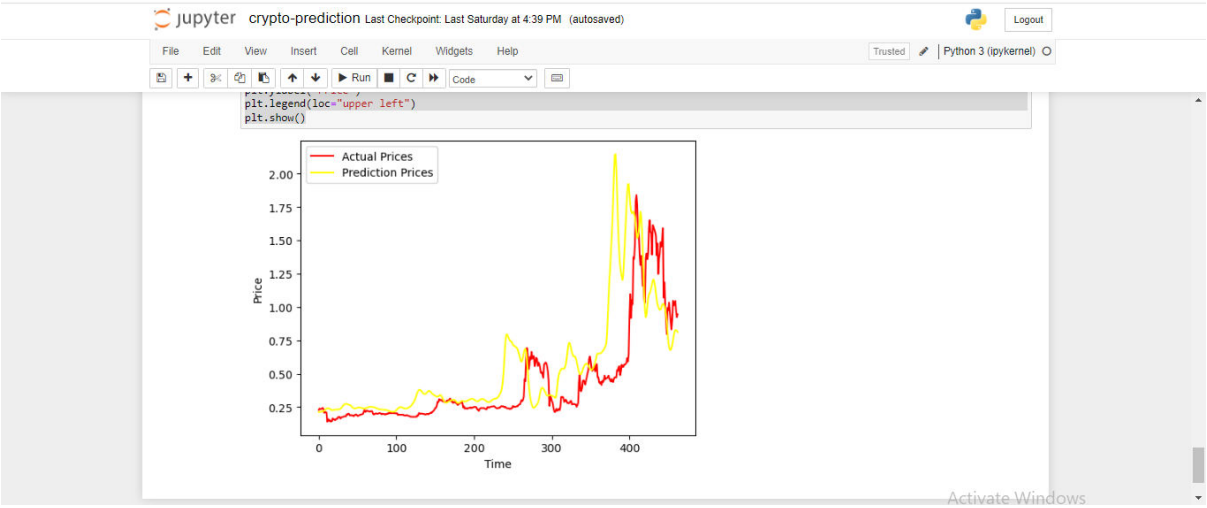
```
(463, 1)

In [17]: model = Sequential()

model.add(LSTM(units=50, return_sequences=True, input_shape=(x_train.shape[1], 1)))
model.add(Dropout(0.2))
model.add(LSTM(units=50, return_sequences=True))
model.add(Dropout(0.2))
model.add(LSTM(units=50))
model.add(Dropout(0.2))
model.add(Dense(1))

model.compile(optimizer='adam', loss='mean_squared_error')
model.fit(x_train, y_train, epochs=30, batch_size=32, validation_data=(x_test,y_test))

Epoch 1/30
75/75 [==============================] - 7s 39ms/step - loss: 0.0028 - val_loss: 0.0020
Epoch 2/30
75/75 [==============================] - 2s 24ms/step - loss: 0.0015 - val_loss: 0.0016
Epoch 3/30
75/75 [==============================] - 2s 27ms/step - loss: 0.0013 - val_loss: 0.0014
Epoch 4/30
75/75 [==============================] - 2s 25ms/step - loss: 8.6855e-04 - val_loss: 0.0016
Epoch 5/30
75/75 [==============================] - 2s 25ms/step - loss: 9.6089e-04 - val_loss: 0.0012
Epoch 6/30
75/75 [==============================] - 2s 26ms/step - loss: 7.0721e-04 - val_loss: 0.0019
Epoch 7/30
```



IV. CONCLUSION

Over the last several years, the cryptocurrency market has expanded significantly, catching the attention of both established corporations and newcomers to the space. By providing analysis and conclusions based on CRYPTOCURRENCY price data, it will aid in understanding the complicated and rapidly evolving sector. Although various theories and algorithms have been developed for the prediction of the price of bitcoins, most of them have been proved that they needed to be reconsidered for reducing problems of overfitting and errors resulting from high sized datasets. The value of bitcoin in the future can be predicted using the LSTM algorithm. Because of the usage of this algorithm, we can save a large amount of data and predict the most accurate results.

REFERENCES

[1] CoinMarketCap. Global Cryptocurrency Charts. Accessed: Jan. 13, 2023. [Online]. Available: https://coinmarketcap.com/charts/

[2] CoinMarketCap. Top Cryptocurrency Spot Exchanges. Accessed: Jan. 13, 2023. [Online]. Available: https://coinmarketcap.com/rankings/ exchanges/

ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| ESTD Year: 2018|

International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

[3] A. M. Khedr, I. Arif, M. El-Bannany, S. M. Alhashmi, and M. Sreedharan, ''Cryptocurrency price prediction using traditional statistical and machinelearning techniques: A survey,'' Intell. Syst. Accounting, Finance Manage., vol. 28, no. 1, pp. 3–34, Jan. 2021, doi: 10.1002/isaf.1488.
[4] D. R. Pant, P. Neupane, A. Poudel, A. K. Pokhrel, and B. K. Lama, ''Recurrent neural network based bitcoin price prediction by Twitter sentiment analysis,'' in Proc. IEEE 3rd Int. Conf. Comput., Commun. Secur. (ICCCS), Oct. 2018, pp. 128–132, doi: 10.1109/CCCS.2018.8586824.
[5] T. Shintate and L. Pichl, ''Trend prediction classification for high frequency bitcoin time series with deep learning,'' J. Risk Financial Manage., vol. 12, no. 1, p. 17, Jan. 2019. [Online]. Available: https://www.mdpi.com/1911-8074/12/1/17
[6] A.-D. Vo, ''Sentiment analysis of news for effective cryptocurrency price prediction,'' Int. J. Knowl. Eng., vol. 5, no. 2, pp. 47–52, 2019, doi: 10.18178/ijke.2019.5.2.116.
[7] J. Chen. Technical Indicator: Definition, Analyst Uses, Types and Examples. Investopedia. Accessed: Jan. 16, 2023. [Online]. Available: https://www.investopedia.com/terms/t/technicalindicator.asp
[8] C. Zhuang. Stockstats (0.5.1). [Online]. Available: https://github.com/ jealous/stockstats [9] B. Dolan. MACD Indicator Explained, With Formula, Examples, and Limitations. Accessed: Jan. 16, 2023. [Online]. Available: https://www. investopedia.com/terms/m/macd.asp
[10] J. Fernando. Relative Strength Index (RSI) Indicator Explained With Formula. Accessed: Jan. 16, 2023. [Online]. Available: https://www. investopedia.com/terms/r/rsi.asp
[11] C. Mitchell. What is the Commodity Channel Index (CCI)? How to Calculate. Accessed: Jan. 16, 2023. [Online]. Available: https://www.investopedia.com/terms/c/commoditychannelindex.asp
[12] C. Mitchell. Average Directional Index (ADX): Definition and Formula. Accessed: Jan. 16, 2023. [Online]. Available: https://www. investopedia.com/terms/a/adx.asp
[13] R. J. Williams, ''Simple statistical gradient-following algorithms for connectionist reinforcement learning,'' Mach. Learn., vol. 8, nos. 3–4, pp. 229–256, May 1992, doi: 10.1007/BF00992696.
[14] R. S. Sutton and A. G. Barto, Reinforcement Learning: An Introduction. Cambridge, MA, USA: MIT Press, 2018.
[15] J. Schulman, F. Wolski, P. Dhariwal, A. Radford, and O. Klimov, ''Proximal policy optimization algorithms,'' 2017, arXiv:1707.06347.
[16] M. Taghian, A. Asadi, and R. Safabakhsh, ''Learning financial assetspecific trading rules via deep reinforcement learning,'' Expert Syst. Appl., vol. 195, Jun. 2022, Art. no. 116523, doi: 10.1016/j.eswa.2022.116523.
[17] T. Théate and D. Ernst, ''An application of deep reinforcement learning to algorithmic trading,'' Expert Syst. Appl., vol. 173, Jul. 2021, Art. no. 114632, doi: 10.1016/j.eswa.2021.114632.
[18] Y.-C. Tsai, F.-M. Szu, J.-H. Chen, and S. Y.-C. Chen, ''Financial visionbased reinforcement learning trading strategy,'' Analytics, vol. 1, no. 1, pp. 35–53, Aug. 2022. [Online]. Available: https://www.mdpi.com/2813-2203/1/1/4
[19] Z. Jiang, D. Xu, and J. Liang, ''A deep reinforcement learning framework for the financial portfolio management problem,'' 2017, arXiv:1706.10059.
[20] L. Weng, X. Sun, M. Xia, J. Liu, and Y. Xu, ''Portfolio trading system of digital currencies: A deep reinforcement learning with multidimensional attention gating mechanism,'' Neurocomputing, vol. 402, pp. 171–182, Aug. 2020, doi: 10.1016/j.neucom.2020.04.004.

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH

IN SCIENCE, ENGINEERING AND TECHNOLOGY

| Mobile No: +91-6381907438 | Whatsapp: +91-6381907438 | ijmrset@gmail.com |

www.ijmrset.com