

CRYPTOCURRENCY PRICE ANALYSIS WITH ARTIFICIAL INTELLIGENCE

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To Cite this Article

Mrs. P.Lakshmi Satya, ,Gorthi Pavani ,Potturi Navya Ragasri ,Bondada Nanda Kishore ,Mopidevi Srikanth ,Amjuri Durga Ram Prasad, **CRYPTOCURRENCY PRICE ANALYSIS WITH ARTIFICIAL INTELLIGENCE** ” *Journal of Science and Technology, Vol. 08, Issue 04,-April 2023, pp18-24*

Article Info

Received: 21-02-2023

Revised: 16-03-2023

Accepted: 26-03-2023

Published: 10-04-2023

Abstract:

Cryptocurrency is playing an increasingly important role in reshaping the financial system due to its growing popular appeal and merchant acceptance. While many people are making investments in Cryptocurrency, the dynamical features, uncertainty, the predictability of Cryptocurrency are still mostly unknown, which dramatically risk the investments. It is a matter to try to understand the factors that influence the value formation. In this study, we use advanced artificial intelligence frameworks of fully connected Artificial Neural Network (ANN) and Long Short-Term Memory (LSTM) Recurrent Neural Network to analyze the price dynamics of Bitcoin, Ethereum, and Ripple. We find that ANN tends to rely more on long-term history while LSTM tends to rely more on short-term dynamics, which indicate the efficiency of LSTM to utilize useful information hidden in historical memory is stronger than ANN. However, given enough historical information ANN can achieve a similar accuracy, compared with LSTM. This project provides a unique demonstration that Cryptocurrency market price is predictable. However, the explanation of the predictability could vary depending on the nature of the involved machine-learning model.

I. Introduction

Cryptocurrency is the peer-to-peer digital money and payment system that exist online via a controlled algorithm. When a miner cracks an algorithm to record a block of transactions to public ledger named Blockchain and the cryptocurrency is created when the block is added to the Blockchain. It allows people to store and transfer through encryption protocol and distributed network. Mining is a necessary and competitive component of the cryptocurrency system. The miner with more computational power has a better chance of finding a new coin than that of less. Bitcoin is the first and one of the leading digital currencies (its market capitalization had more than \$ 7 billion in 2014, and then it increased significantly to \$ 29 billion in 2017) which was first introduced by Satoshi Nakamoto in 2008. Among many features of bitcoin, the most impressive one is decentralization that it can remove the involvement of traditional financial sectors and monetary authorities effectively due to its Blockchain network features . In addition, the electronic payment system of Bitcoin is based on cryptographic proof rather than the trust between each other as its transaction history cannot be changed unless redoing all proof of work of all Blockchain, which play a critical role of being a trust intermediary and this can be widely used in reality such as recording charitable contribution to avoid corruption. Moreover, bitcoin has introduced the controllable anonymity scheme, and this enhances users' safety and anonymity by using this technology, for instance, we can take advantage of this property of Blockchain to make identification cards, and it not only can protect our privacy but verify our identity. Nowadays, investing in cryptocurrencies, like Bitcoin, is one of the efficient ways of earning money. We aim to use two artificial intelligence

modelling frameworks to understand and predict the most popular cryptocurrencies price dynamics, including Bitcoin, Ethereum, and Ripple

II. LITERATURE SURVEY

“Using the Bitcoin Transaction Graph to Predict the Price of Bitcoin”

AUTHORS: Greaves, A., & Au, B. [2015]”

Bitcoin is the world’s leading cryptocurrency, allowing users to make transactions securely and anonymously over the Internet. In recent years, The Bitcoin the ecosystem has gained the attention of consumers, businesses, investors and speculators alike. While there has been significant research done to analyze the network topology of the Bitcoin network, limited research has been performed to analyze the network’s influence on overall Bitcoin price. In this paper, we investigate the predictive power of blockchain network-based features on the future price of Bitcoin. As a result of blockchain-network based feature engineering and machine learning optimization, we obtain up-down Bitcoin price movement classification accuracy of roughly 55%.

"Cryptocurrency Value Formation: An Empirical Analysis Leading To A Cost Of Production Model For Valuing Bitcoin"

AUTHORS: Hayes, A. S. [2017]

This paper aims to identify the likely source(s) of value that cryptocurrencies exhibit in the marketplace using cross sectional empirical data examining 66 of the most used such 'coins'. A regression model was estimated that points to three main drivers of cryptocurrency value: the difficulty in 'mining 'for coins; the rate of unit production; and the cryptographic algorithm employed. These amount to relative differences in the cost of production of one coin over another at the margin, holding all else equal. Bitcoin-denominated relative prices were used, avoiding much of the price volatility associated with the dollar exchange rate. The resulting regression model can be used to better understand the drivers of relative value observed in the emergent area of cryptocurrencies. Using the above analysis, a cost of production model is proposed for valuing bitcoin, where the primary input is electricity. This theoretical model produces useful results for both an individual producer, by setting break even points to start and stop production, and for the bitcoin exchange rate on a macro level. Bitcoin production seems to resemble a competitive commodity market; in theory miners will produce until their marginal costs equal their marginal product.

“Economic prediction using neural networks: the case of IBM daily stock returns”

AUTHORS: H. White [1988]

A report is presented of some results of an ongoing project using neural-network modeling and learning techniques to search for and decode nonlinear regularities in asset price movements. The author focuses on the case of IBM common stock daily returns. Having to deal with the salient features of economic data highlights the role to be played by statistical inference and requires modifications to standard learning techniques which may prove useful in other contexts.

“Designing a neural network for forecasting financial and economic time series”

AUTHORS: Kaastra and M. Boyd [1996]

Artificial neural networks are universal and highly flexible function approximators first used in the fields of cognitive science and engineering. In recent years, neural network applications in finance for such tasks as pattern recognition, classification, and time series forecasting have dramatically increased. However, the large number of parameters that must be selected to develop a neural network forecasting model have meant that the design process still involves much trial and error. The objective of this paper is to provide a practical introductory guide in the design of a neural network for forecasting economic time series data. An eight-step procedure to design a neural network forecasting model is explained including a discussion of tradeoffs in parameter selection, some common pitfalls, and points of disagreement among practitioners.

III.SYSTEM ANALYSIS

3.1. EXISTING SYSTEM

Although existing efforts on Cryptocurrency analysis and prediction is limited, a few studies have been aiming to understand the Cryptocurrency time series and build statistical models to reproduce and predict price dynamics. While an increasing number of people are making investments in Cryptocurrency, the majority of investors cannot get such profit for being inconsiderable to cryptocurrencies' dynamics and the critical factors that influence the trends of bitcoins. Although existing efforts on Cryptocurrency analysis and prediction is limited, a few studies have been aiming to understand the Cryptocurrency time series and build statistical models to reproduce and predict price dynamics. While an increasing number of people are making investments in Cryptocurrency, the majority of investors cannot get such profit for being inconsiderable to cryptocurrencies' dynamics and the critical factors that influence the trends of bitcoins.

DISADVANTAGES OF EXISTING SYSTEM

Therefore, raising people's awareness of vital factors can help us to be wise investors. Although market prediction is demanding for its complex nature, the dynamics are predictable and understandable to some degree. Identification of better Cryptocurrency growth is very difficult. We need to depend upon the manual way of predictions.

3.2. PROPOSED SYSTEM

Among many features of bitcoin, the most impressive one is decentralization that it can remove the involvement of traditional financial sectors and monetary authorities effectively due to its block chain network features. In addition, the electronic payment system of Bitcoin is based on cryptography proof rather than the trust between each other as its transaction history cannot be changed unless redoing all proof of work of all block chain, which play a critical role of being a trust intermediary and this can be widely used in reality such as recording charitable contribution to avoid corruption. In proposed model we are going to implement advanced Artificial Intelligence framework of fully connected Artificial Neural Network (ANN) and Long Short-Term Memory (LSTM) to analyze the price dynamics of Crypto currencies. Among ANN and LSTM, ANN will analyze more effectively for long term history, LSTM is for short term dynamics. LSTM is more useful than ANN for hidden historical memory data analysis. With this we can easily predict the Cryptocurrency market price in more effective way.

ADVANTAGES OF PROPOSED SYSTEM:

The bitcoin has introduced the controllable anonymity scheme, and this enhances users' safety and anonymity by using this technology, for instance, we can take advantage of this property of Blockchain to make identification cards, and it not only can protect our privacy but verify our identity. With the help of this we easily predict the Cryptocurrency market price. Getting more detailed analysis in a very short time period.

IV.SYSTEM DESIGN

4.1 SYSTEM ARCHITECTURE

Below diagram depicts the whole system architecture of the most trending articles every year using NLP technique.

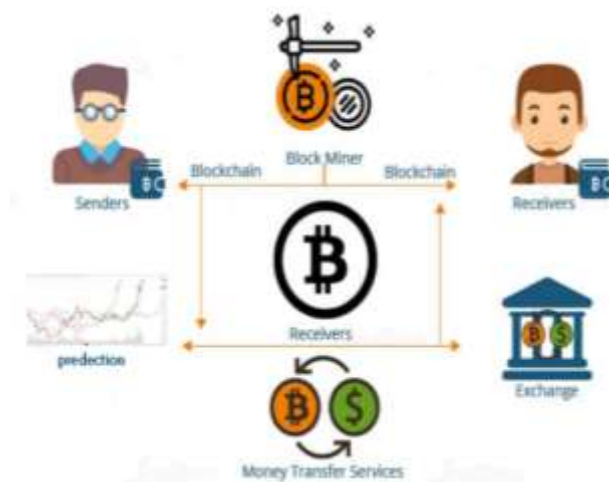


Fig.4.1.1 System Architecture

V. SYSTEM IMPLEMENTATION

5.1. MODULES

- USER MODULE
- AGENT MODULE
- ADMIN MODULE
- ARTIFICIAL INTELLIGENCE

Module description:

5.1.1 User Module

The electronic payment system of Bitcoin is based on Cryptographic proof rather than the trust between each other as its transaction history cannot be changed unless redoing all proof of work of all Blockchain, which play a critical role of being a trust intermediary and this can be widely used in reality such as recording charitable contribution to avoid corruption. Moreover, bitcoin has introduced the controllable anonymity scheme, and this enhances users' safety and anonymity by using this technology, for instance, we can take advantage of this property of Blockchain to make identification cards, and it not only can protect our privacy but verify our identity.

5.1.2 Agent Module

While an increasing number of people are making investments in Cryptocurrency, the majority of investors cannot get such profit for being inconsiderable to cryptocurrencies' dynamics and the critical factors that influence the trends of bitcoins. Therefore, raising people's awareness of vital factors can help us to be wise investors. Although market prediction is demanding for its complex nature, the dynamics are predictable and understandable to some degree. For example, when there is a shortage of the bitcoin, its price will be increased by their sellers as investors who regard bitcoin as a profitable investment opportunity will have a strong desire to pay for bitcoin. Furthermore, the price of bitcoin may be easily influenced by some influential external factors such as political factors.

5.1.3 Admin Module

The aim of admin is to approve the users and agents. When a miner cracks an algorithm to record a block of transactions to public ledger named blockchain and the cryptocurrency is created when the block is added to the blockchain. It allows people to store and transfer through encryption protocol and distributed network. Mining is a necessary and competitive component of the cryptocurrency system. The miner with more computational power has a

better chance of finding a new coin than that of less. Bitcoin is the first and one of the leading digital currencies. Among many features of bitcoin, the most impressive one is decentralization that it can remove the involvement of traditional financial sectors and monetary authorities effectively due to its blockchain network features.

5.1.4 Artificial Intelligence

The application of advanced digital, smart technologies, robotic systems, new materials and design techniques, creation of large data processing systems, computer-aided learning and artificial intelligence (AI) are relevant for various branches of science and technology, including manned space programs. Some technology concepts and pilot systems based on the AI (3-D computer vision, automated systems for planning and evaluating the activities of cosmonauts, inquiry and communications system) were developed in the industry over several decades.

VI. RESULTS



Fig. 6.1 Current Rate of Cryptocurrencies

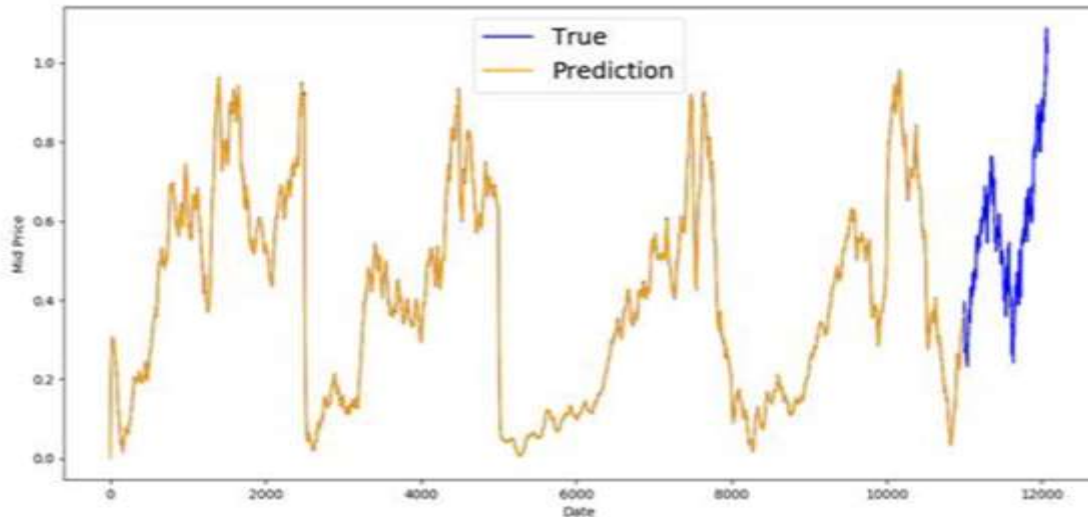


Fig. 6.2 Predictions

VII.CONCLUSION AND FUTURE WORK

CONCLUSION

Cryptocurrency, such as Bitcoin, has established itself as the leading role of decentralization. There are a large number of cryptocurrencies sprang up after Bitcoin such as Ethereum and Ripple. Because of the significant uncertainty in its prices, many people hold them as a means of speculation. Therefore, it is critically important to understand the internal features and predictability of those cryptocurrencies. In this study, we use two distinct artificial intelligence frameworks, namely, fully-connected Artificial Neural Network (ANN) and Long-Short-Term-Memory (LSTM) to analyses and predict the price dynamics of Bitcoin, Ethereum, and Ripple. We showed that the ANN and LSTM models are comparable and both reasonably well enough in price prediction, although the internal structures are different. Then we further analysis the influence of historical memory on model prediction. We find that ANN tends to rely more on long-term history while LSTM tends to rely more on short-term dynamics, which indicate the efficiency of LSTM to utilize useful information hidden in historical memory is stronger than ANN. However, given enough historical information ANN can achieve a similar accuracy, compared with LSTM. This study provides a unique demonstration that Cryptocurrency market price is predictable. However, the explanation of the predictability could vary depending on the nature of the involved machine-learning model.

FUTURE WORK

Current work focuses on one-day ahead and partly on three-day ahead prediction (2016-17 dataset) of Bitcoin price. However, we can follow a similar procedure to perform multi-step ahead prediction of Bitcoin price thereby increasing the scope of experiments. In addition to cryptocurrency Bitcoin, there are other cryptocurrencies such as Ethereum, Litecoin, Ripple, etc. that gained attention in the trading markets. Analysis on these cryptocurrencies can help investors decide which one to buy or sell so as to end up with profitable trades. Also, I have plans on using the GPU based accelerator that can significantly reduce the training time of the models. Deep learning techniques such as Long Short-Term Memory (LSTM) networks (Hochreiter & Schmidhuber, 1997) can also boost the predictions, thereby helping to make better trading decisions. The scope of this project can be extended to use some deep learning techniques.

REFERENCES :

- [1] an exploration On Bitcoin worth Prediction mistreatment Machine Learning Algorithms, Lekkala Sreekanth Reddy, Dr. P. Sriramya, 2020.
- [2] Bitcoin worth prediction mistreatment LSTM and 10- Fold Cross validation, Sakshi Tandon, Shreya Tripathi, Pragya Saraswat, Chetna Dabas, 2019.
- [3] Bitcoin worth prediction mistreatment Deep Learning algorithmic program, Muhammad Rizwan, Dr. Sanam Narejo, Dr. Moazzam Javed, 2019.
- [4] CryptoCurrency worth prediction mistreatment call Tree and Regression techniques, Karunya Rathan, Somarouthu Venkat Sai, Tubati Sai Manikanta, 2019.
- [5] Cryptocurrency worth Analysis With AI, Wang Yiyang, Zang Yeze, 2019.
- [6] Performance analysis of Machine Learning Algorithms for Bitcoin worth Prediction, Kavitha H, Uttam Kumar Sinha, SurbhiS Jain, 2020
- [7] Greaves, A., & Au, B. (2015). Using the bitcoin transaction graph to predict the price of bitcoin.
- [8] Hayes, A. S. (2017). Cryptocurrency value formation: An empirical study leading to a cost of production model for valuing bitcoin. *Telematics and Informatics*, 34(7), 1308-1321.
- [9] Shah, D., & Zhang, K. (2014, September). Bayesian regression and Bitcoin. In *Communication, Control, and Computing (Allerton)*, 2014 52nd Annual Allerton Conference on (pp. 409-414). IEEE.
- [10] Amjad, M. J. & Shah, D. (2017). "Trading Bitcoin and Online Time Series Prediction". *Proceedings of the Time Series Workshop at NIPS 2016*, (pp. PMLR 55:1-15).
- [11] Billah, M. & Waheed, S. (2015). "Predicting Closing Stock Price using Artificial Neural Network and Adaptive Neuro Fuzzy Inference System (ANFIS): The Case of the Dhaka Stock Exchange", *International Journal of Computer Applications* (0975 - 8887), Volume 129 - No.11.
- [12] Billard, A., de Chambrier, Guillaume., Figueroa, N. & Lamotte, D. (2016). *Advanced Machine Learning, Practical 4: Regression (SVR, RVR, GPR)*.
- [13] Box, J. & Reinsel. (1994). *Time Series Analysis, Forecasting and Control* (3 ed.). Englewood Cliffs, NJ: Prentice Hall. [13] MESSIDOR, Methods for Evaluating Segmentation and Indexing technique Dedicated to Retinal Ophthalmology, <http://messidor.crihan.fr/index-en.php>, 2004.