



CRYPTOCURRENCY PRICE PREDICTION USING MACHINE LEARNING PYTHON

Benitha Christinal J ¹,Guna Subha K ²,Harshini B ³,Lakshmi Prabha R ⁴

^{1,2,3,4} Department of Information Technology, Panimalar Engineering College, Chennai-600123.

jbenitha@panimalar.ac.in, gunasubhak@gmail.com , harshini2003@gmail.com , prabhalakshmi012@gmail.com.

ABSTRACT

Predicting the price of Cryptocurrency is an arduous task. The research purpose of this project is to obtain the most possible accurate value of the cryptocurrency based on their historical datasets determining factors like supply and demand, government regulation, media hype through the research methodology like linear regression, random forest,KNN algorithm, LSTM , elastic net and SVR algorithm and taking the mean rate of all predicted values calculated by the algorithms using machine learning python.

KEYWORDS: Cryptocurrency , LSTM, machine learning, SVR algorithm, KNN algorithm ,random forest , linear regression.

CRYPTOCURRENCY PRICE PREDICTION USING MACHINE LEARNING PYTHON

INTRODUCTION

A cryptocurrency is a virtual or digital currency which works on block chain technology and is designed as work on a medium of exchange on buy goods and services online and produce payment that is introduced to the world first in terms of "bitcoin" a type of cryptocurrency in 2008 by Satoshi Nakamoto. Yippee decentralized and free from any third party authority, which means the cryptocurrency is not issued or controlled by a government or other substances and that is the reason cryptocurrency transactions have never failed. Cryptocurrencies are immune to counterfeiting; it does not require a central authority and is protected by powerful and complex algorithms. Bill Gates co-founder of Microsoft Corporation and Elon Musk, CEO of Tesla, supports cryptocurrencies as it is, it must be better and safer than physical money and also have a great future. Transaction they fail due to any of the following factors

1. Transfer Limit Exceeded
2. Account Hacking
3. Technical Problems

To solve these problems, the concept cryptocurrency originated with

1. No or very low transaction costs
2. No Limit on Transaction
3. 24/7 Access

LITERATURE REVIEW

In this article [1], he compares different methodologies such as ARIMA, Random Forest (RF), Support Vector Machine (SVM), Long Short Term Memory (LSTM) and WaveNets to estimate the future price of Bitcoin. They concluded that there is a compatible model for different time series in the Bitcoin time series. Here they describe a linear model for the Bitcoin price [2] that includes Bayesian regression functions based on Bitcoin currency statistics, mining processes, Google search trends, and Wikipedia page visits. The problem is to find a method to predict the two-hour price of cryptocurrencies based on social factors, which are increasingly used for online transactions worldwide [3], they try to predict the future prices of cryptocurrencies using a multi-linear regression model. This paper [4] conducts a study on the evolution of Bitcoin and a

systematic review of the various machine learning algorithms used to predict prices is carried out. Benchmarking is done to select the optimal price forecasting techniques. Use both neural network algorithms such as artificial neural network (ANN), recurrent neural network (RNN) and convolutional neural network (CNN) as well as some famous supervised learning algorithms such as Random Forest (RF) and k-nearest neighbors (kNN), to create the analysis in [5]. Time price prediction charts and epoch loss accuracy charts are used to analyze each algorithm working on the same data and giving different results. Finally, the best fit algorithms are used to predict the future price of Bitcoin. Here in [6] they proposed a correlation between Bitcoin price change and sentiment of its users by implementing machine learning algorithms. With sentiment, they predicted the change in the price of bitcoin, hoping to find the meaning of people opinion in the field of cryptocurrencies. This paper [7] was developed to predict Bitcoin price using

Recurrent Neural Network (RNN), Long Short Term Memory (LSTM) and Linear Regression (LR) to predict Bitcoin price. An evaluation of these algorithms is done to determine which one is better for Bitcoin price prediction. The research tackles the problem by predicting cryptocurrency using three different algorithms which are K Nearest Neighbors (KNN), Support Vector Machine (SVM) and Long Short-Term Memory (LSTM) in [8]. They detected the rise and fall in the value of cryptocurrencies using the Root Mean Square Error (RMSE) to evaluate the stability of finances. They concluded that LSTM was designed as an algorithm to match the value of cryptocurrencies.

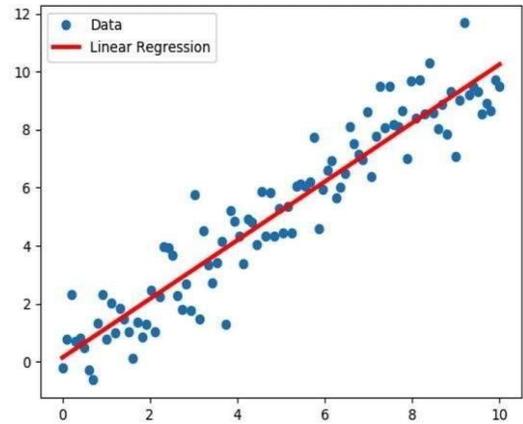
In all these papers, cryptocurrency prices are determined using one of the research methods such as linear regression, time series models such as ARIMA (auto-regressive integrated moving average), LSTM (long short term memory), ensemble methods such as random forest, vector support Machine (SVM), Reinforcement Learning or Bayesian models. Even if more than one algorithm is used, only the best or most accurate algorithm of all is considered. Using this, the possible exact values can be calculated, but in our research, what we proposed can find a more advanced possible exact value than the existing system, the reason is that we consider the average of 5 algorithms, namely linear regression, decision tree, random forest, KNN algorithm and LSTM.

METHODOLOGY

CRYPTOCURRENCY PRICE PREDICTION USING MACHINE LEARNING PYTHON

LINEAR REGRESSION

Linear regression models the relationship between independent variables (traits) and the product variable (value) as linear equations. This is a simple and self-explanatory algorithm.

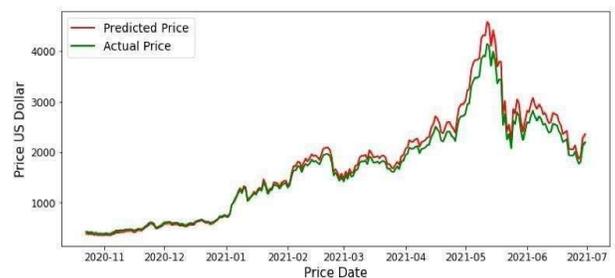


RANDOM FOREST

The random forest algorithm is a popular supervised machine learning algorithm used in classification and regression problems in machine learning. We know that the forest has countless trees, and where there are many trees, the forest is very big. Similarly, the more trees the so-called there are in the random forest algorithm. It is accurate and the more likely it will be to solve problems. A random forest is a classifier that has multiple decision trees of different subsets given out data files and averages them to improve dataset release accuracy. It is based on the concept of ensemble learning, which is the process of combining multiple classifiers to solve complex problems and improve the model performance.

KNN ALGORITHM

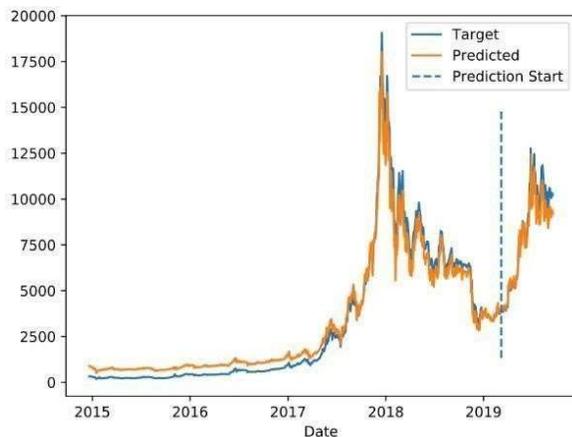
K-nearest neighbor algorithm. To-closest neighbor algorithm, also known as KNN or k- NN is a non-parametric supervision a learning classifier that uses proximity to classify groups of data or predict their content.



CRYPTOCURRENCY PRICE PREDICTION USING MACHINE LEARNING PYTHON

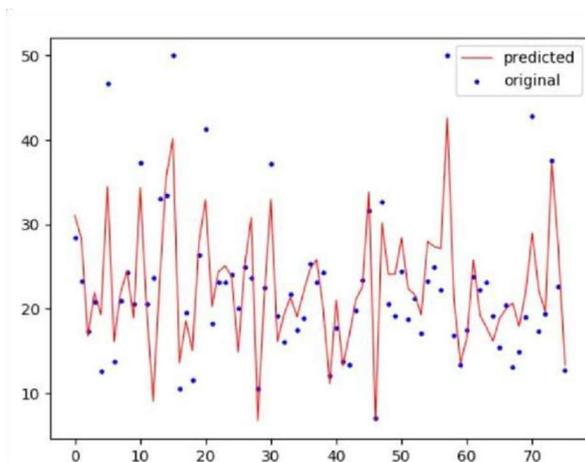
LSTM

LSTM is a convolutional neural network (RNN) which can capture long-term dependencies in data series. It is very good for creating data series such as cryptocurrency prices.



ELASTIC NET

Elastic mesh is a popular type of horizontal regression that combines two rich features namely L1 and L2 error.

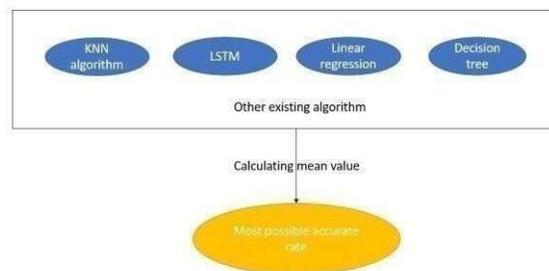


SVR ALGORITHM

SVR is an important algorithm that allows us to choose our error tolerance based on the margin of error (ϵ) or by setting fault tolerance Experiences.

ARCHITECTURE

We implemented our project on determining the value of the cryptocurrency as a whole research methodology, multiple algorithms we are used to predicting the price of specific goods cryptocurrency. Each algorithm has its own values and now we have proposed our idea for the realization of the project should take everything the predicted prices of each algorithm and calculated the mean speed of the values. So we could find the most accurate measure cryptocurrency than the existing system.



REQUIREMENTS

HARDWARE REQUIREMENTS

WINDOW 7 OR HIGHER

For small to medium datasets and simple models, a modern multi-core CPU (e.g. Intel Core i5 or i7, AMD Ryzen 5 or 7) should be enough. A fast SSD (Solid State Drive) is very good recommended for saving datasets and models checkpoints. It will significantly speed up the data load and model training. If you plan to train deep learning models for cryptocurrency price prediction with a highly dedicated GPU ID advantageous. GPUs, such as those from NVIDIA (e.g. GeForce RXT or Quadro series), can dramatically speed up training times they need machine learning libraries and frameworks such as TensorFlow, PyTorch, scikitlearn. Depending on your preferred tools and algorithms.

I3 PROCESSOR OR HIGHER

The Intel Core I3 processor is a basic dual-core processor suitable for everyday computer work tasks. Cryptocurrency price prediction tasks can benefit from a multi-core processor. Consider upgrading to an Intel Core i5 or i7 processor with more cores if your budget allows. Learning tasks are

CRYPTOCURRENCY PRICE PREDICTION USING MACHINE LEARNING PYTHON

highly parallelizable and can take advantage of GPU computing power (such as those in the NVIDIA GeForce GTX or RTX series) effectively.

8 RAM OR HIGHER

To predict the price of cryptocurrency using machine learning. It is recommended to have at least 8 GB of RAM as a bare minimum. Ideally you should aim for 16GB or more, especially if you plan overall models. With sample RAM will improve your overall workflow, reduce practice times and allow you to experiment various machine learning algorithms and hyperparameters more efficiently.

SOFTWARE REQUIREMENTS PYTHON

Python's flexibility and extensive libraries make it a valuable tool for cryptocurrency price forecasts. Python allows loading cryptocurrency price data from various sources such as cryptocurrency exchange and API. You can use libraries like ccxt, cryptocompare or historical and real-time data retrieval requirements.

EXCEL SHEETS (with datasets)

Excel can be a useful tool for certain aspects of cryptocurrency price prediction especially for initial data exploration, visualization and basic analysis.

IMPLEMENTATION

Creating a set of predictions by averaging predictions from multiple machine learning models is a technique that can increase cryptocurrency price accuracy and strength predictions. This method is called "model averaging" or "composing models". You can do this one :

Select a set of models

Start by choosing a machine learning set of models to be used to price the cryptocurrency forecast. This can include linear regression, time series models (such as ARIMA or LSTM), clustering techniques (forest, gradient gain) and any other models you see fit.

Train individual models

Use training models to make predictions about the data set you want to predict. This document must

have the same properties that were used during studies.

Make predictions

Use trained models to make predictions on the dataset you want to predict. This the dataset should have the same properties as those used in training.

Calculate average predictions

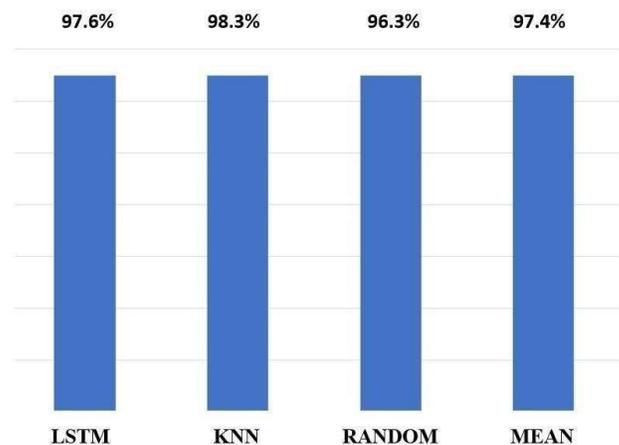
For each data point in the prediction database average(or weighted average) predictions made by each model is calculated. This will be your exact prediction.

Evaluate the file model

Evaluate the performance of the model design using appropriate metrics such as mean error(MAE), mean squared error (MSE) or root mean square root mean square error (RMSE) of the validation or test data.

Adjust weights (optional)

If you want some models in the cluster to be more important than others, you can assign a weight to each model prior prediction average calculation. Here is a Python code snippet he demonstrates this by averaging predictions of three hypothetical models:



We implemented our project on determining the value of the cryptocurrency as a whole research methodology, multiple algorithms we are used to predicting the price of specific goods cryptocurrency .Each algorithm has its own values

CRYPTOCURRENCY PRICE PREDICTION USING MACHINE LEARNING PYTHON

and now we have proposed our idea for the realization of the project should take everything the predicted prices of each algorithm and calculated the mean speed of the values. So we could find the most accurate measure of cryptocurrency than the existing system.

CONCLUSION

In a rapidly changing and highly volatile world cryptocurrency trading, exact price prediction is essential. To solve cryptocurrency price prediction challenges, averaging the predictions of different machines Learning algorithms have proven to be an important strategy. The best thing about this method is her ability to increase forecast accuracy. The cryptocurrency market is influenced by many factors, both substantive and technical. This approach allows us to capture the overall market using insights from various algorithms. Each algorithm will be effective in designing a specific pattern of price movement, that is reducing the bias and errors associated with each pattern. Also the concept of machine learning with average learning helps to increase performance of price prediction. Cryptocurrency markets are known to be vulnerable to sudden unpredictable events and dramatic price fluctuations. By providing a better understanding of price movements, strategies can help traders and investors create consistent, informed and effective risk mitigating strategies through integration of more models. The cryptocurrency market is rapidly evolving and its entire structure must evolve with it. In addition, there may be a translation affected to some extent during use concatenation; therefore, a careful balance is necessary to be struck between accuracy and transparency.

REFERENCES

- [1] Leonardo Felizardo Escola, Roberth Oliveira Escola and Emilio Del- Moral Hernandez Escola Politécnica Universidade de Sao Paulo ~ Sao Paulo, Brazil "Comparative study of Bitcoin price prediction using WaveNets, Recurrent Neural Networks and other Machine Learning Methods" (2019 6th International Conference on Behavioral, Economic and Socio-Cultural Computing)
- [2] Bohdan M. Pavlichenko SoftServe, Inc., 2D Sadova St., 79021 Lviv, Ukraine Ivan Franko National University of Lviv, 1, Univerzitetska St., 79000 Lviv, "Bitcoin Price Predictive Modeling Using Expert Correction ." (2019 XIth International Scientific and Practical Conference on Electronics and Information Technologies (ELIT))
- [3] Uttam Kumar Sinha ISI15IS060 ,Surbhi S Jain ISI15IS057 and Kavitha H Associate Professor Department of Information Science and Engineering Siddaganga Institute of Technology, Tumkur, Karnataka "Performance Evaluation of Machine Learning Algorithms for Bitcoin Price Prediction" Proceedings of the Fourth International Conference on Inventive Systems and Control (ICISC 2020) IEEE Xplore Part Number: CFP20J06-ART; ISBN: 978-1-7281-2813-9
- [4] Shaomi Rahman, Jonayed Nafis Hemel, Syed Junayed Ahmed Anta, Hossain Al Muhee and Jia Uddin RWTH Aachen University "Sentiment Analysis Using R An Approach to Correlate Cryptocurrency Price Fluctuations with Change in User Sentiment Using Machine Learning" Conference: 2018 Joint 7th International Conference on Informatics, Electronics Vision (ICIEV) and 2018 2nd International Conference on Imaging, Vision Pattern Recognition (icIVPR)
- [5] Mayukh Samaddar, Rishiraj Roy, Sayantan De and Raja Karmakar (Department of CSE and IT, Techno International New Town, Kolkata, India) "A Comparative Study of Different Machine Learning Algorithms on Bitcoin Value Prediction" 2021 International Conference on Advances in Electrical, Computing, Communication and Sustainable Technologies (ICAECT) [978- 17281-5791-7/20/\$31.00 ©2021 IEEE
|DOI:10.1109/ICAECT49130.2021.9392629