

# OPTI-CRYPTO: Maximizing Returns with Machine Learning

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**Abstract:** *The role of Cryptocurrency has been really important in reshaping the financial system due to its increasing popular appeal and worldwide acceptance. A lot of people have started to make investments in Cryptocurrency, but the dynamical features, uncertainty, and predictability of Cryptocurrency are still mostly unknown, which dramatically risks the investments. It is a matter of trying to understand the factors that influence the value formation. In this study, we use advanced artificial intelligence frameworks of Long Short Term Memory (LSTM) and Recurrent Neural Network (RNN) to predict the price of different cryptocurrencies. Evaluation of these algorithms is carried out to determine better prediction to analyze the price dynamics of different cryptocurrencies including Bitcoin, Ethereum, and Ripple. However, the explanation of the predictability could vary depending on the design of the machine-learning model which is implemented.*

**Index Terms -** Long Short Term Memory, Recurrent Neural Network, Cryptocurrency, Machine Learning

## I. INTRODUCTION

The first decentralized digital currency or cryptocurrency, which was introduced in 2008 in a paper by author Satoshi Nakamoto, was Bitcoin [2]. Bitcoin is one of the most valuable cryptocurrency in the world. A cryptocurrency in essence is a digital asset meaning it exists in a binary format and comes with the right to use and the data that do not possess that right are not considered assets, and it is designed to work as a method of exchange that uses robust cryptography to ensure reliable financial transactions, and substantiate the transfer of assets. After the release of Bitcoin in 2009, over 4000 alternative variants of Bitcoin which are referred to as “altcoins” have been created [6].

Over the past few months, the cryptocurrency market has gone through enormous volatility [6]. Volatility as a proportion of value fluctuations, it significantly affects exchange processes and investment choices just as on alternative determining and proportions of fundamental risk [4]. The worth of all different cryptocurrencies fluctuates simply like a stock though in an unexpected way. There are various calculations utilized on financial exchange information for value forecasts. Notwithstanding, the parameters influencing cryptocurrencies are extraordinary. In this manner it is important to forecast the estimation of different cryptocurrencies so the right decision can be made [1]. The cost of these cryptocurrencies doesn't rely upon business occasions or mediating the government, not at all like securities exchanges. Hence, to predict the worth we feel it is very important to use AI innovation to foresee the cost of different cryptocurrencies [3].

## II. Previously used Methods:

Cryptocurrency is undoubtedly one of the most complex and volatile forms of investments. Fortunately, thanks to growth in the development towards cryptocurrency, people are now able to make their portfolio diversified and new investors are emerging. Moreover, people can use not only computers but also various types of handheld devices, e.g., smartphones and tablets, to surf websites and various applications so as to buy easily as information technology advances recently.

The developed system allows predicting a cryptocurrency rate. Machine learning and Data Mining is used for forecasting this rate.

LSTM, RNN, Decision tree, ANN and Linear regression are used to allow training of bitcoin prices as time series data efficiently. In this system, it is possible to predict the course of a cryptocurrency for various time intervals. The time taken for compilation of the model and their prediction accuracy is different for different algorithms. Although existing efforts on Cryptocurrency price analysis and prediction are limited, a few studies have been aiming to understand the Cryptocurrency time series and build statistical models to recreate and predict dynamics of price [5].

### III. COMPARATIVE STUDY

Table 3.1: Comparative study of various algorithms

Parameter	Linear Regression	Artificial Neural Network (ANN)	Long Short Term Memory (LSTM)	Recurrent Neural Network (RNN)	Decision Tree
Method used	Pattern Recognition	Pattern Recognition	Pattern Recognition	Pattern Recognition	Splitting data into at least two sets
Accuracy	97.59%	84.80%	92.30%	85.40%	95.88%
Complexity	Simple	Very High	Moderate	Very High	Moderate
Speed	Fastest	Slow	Moderate	Slow	Fast
Advantages and Disadvantages	<u>Advantages</u> - Fast Training <u>Disadvantages</u> - Low capability in recognising longer term dependencies	<u>Advantages</u> - Can approximate any continuous function <u>Disadvantages</u> - Requires heavy computation	<u>Advantages</u> - LSTM could best forecast next day price prediction <u>Disadvantages</u> - Requires more memory to train	<u>Advantages</u> - RNN is for sequence or time series data <u>Disadvantages</u> - Training of RNN is tough	<u>Advantages</u> - Generates understandable rules <u>Disadvantages</u> - Computationally expensive

### IV. FLOW DIAGRAM

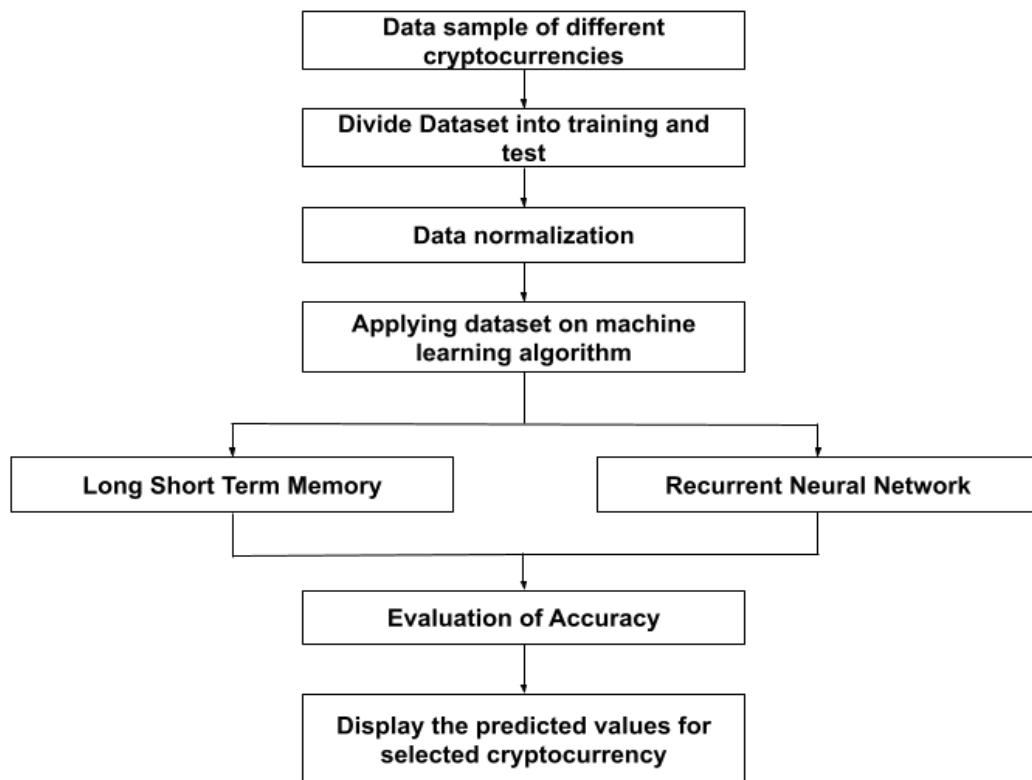


Fig 4.1: Overview of system

### V. Proposed Method:

Bitcoin's most exceptional feature is its spreading, which, because of its blockchain, utterly eliminates the ability of ancient banking and financial establishments. to some extent, network options. what is more, Bitcoin's electronic payment system relies on cryptological proof instead of mutual trust, as its group action history cannot be modified while not redoing it everywhere once more. All blockchain proofs of labor, that function a trust mediator and may be utilized in a spread of the way in practise, like recording charitable donations to avoid

corruption. An implementation may be a realization of a technical specification or algorithmic rule as program, computer code parts, or different system although programming and readying. various implementations might exist for specifications or norms. Implementation literally suggests that to place into product or to carry out.

```
E:\project\New folder\Code\cryptobitcoin>
E:\project\New folder\Code\cryptobitcoin>cd EE:\project\New folder\Code\cryptobitcoins
The filename, directory name, or volume label syntax is incorrect.
E:\project\New folder\Code\cryptobitcoin>cd E:\project\New folder\Code\cryptobitcoin
E:\project\New folder\Code\cryptobitcoin>workon pp
(pp) E:\project\New folder\Code\cryptobitcoin>python manage.py runserver
Watching for file changes with StatReloader
Performing system checks...
```

```
E:\project\New folder\Code\cryptobitcoin>
E:\project\New folder\Code\cryptobitcoin>cd EE:\project\New folder\Code\cryptobitcoins
The filename, directory name, or volume label syntax is incorrect.
E:\project\New folder\Code\cryptobitcoin>cd E:\project\New folder\Code\cryptobitcoin
E:\project\New folder\Code\cryptobitcoin>workon pp
(pp) E:\project\New folder\Code\cryptobitcoin>python manage.py runserver
Watching for file changes with StatReloader
Performing system checks...

System check identified no issues (0 silenced).
You have 18 unapplied migration(s). Your project may not work properly until you apply the migrations for app(s): admin, agents, auth, contenttypes, sessi
on, users.
Run 'python manage.py migrate' to apply them.
October 26, 2021 - 09:37:11
Django version 3.2.7, using settings 'cryptobitcoin.settings'
Starting development server at http://127.0.0.1:8000/
Quit the server with Ctrl-C.
```

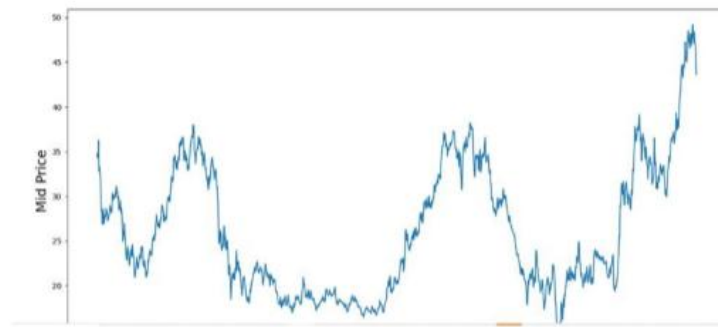
home page



Agent



Cryptocurrency graph



## VI. CONCLUSION AND FUTURE WORK

In this project, we use two distinct artificial intelligence frameworks, namely, Long Short Term Memory and Recurrent Neural Network to analyze and predict the price dynamics of Bitcoin, Ethereum, Ripple and many more cryptocurrencies. We showed that the LSTM and RNN models are comparable and both reasonably well enough in price prediction, although the internal structures are different.

In the coming semester we will be developing our first prototype model using Long Short Term Memory (LSTM) and Recurrent Neural Network (RNN) algorithm which will enable us to generate a prediction model for forecasting the prices of all cryptocurrencies. We would also be reducing the noise in the datasets for better efficiency of model and accuracy. We will consider different aspects to which our system should justify and fine tune its functionality and work to give the user the best experience.

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