CHAPTER 29

Cryptocurrency Price Prediction Using FB Prophet Model

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Abstract: A new method encountered for securing cryptocurrency *i.e* cryptographic algorithms for example Secure Hash Algorithm (SHA-2) and Message Digest (MD5). It uses Blockchain technology to make the transactions secure, transparent, traceable, and immutable. This is the reason cryptocurrencies have gained popularity in almost all sectors, especially in the financial sector. Cryptocurrency price prediction has become a trending research topic globally. Many Machine Learning algorithms have been developed such as Linear Regression, SVM, Random forest, and Facebook Prophet. Facebook Prophet is a time-series forecasting model for predicting the future price of bitcoins. In this paper, Facebook prophet Model is used, and two cryptocurrencies are considered, namely Bitcoin and Litecoin. The result depicts that FB prophet Model accurately predicts the prices of bitcoin cryptocurrencies. We considered the data from yahoofinace.com for BTC-USD and LTC-USD.

Keywords: Bitcoin, Cryptocurrency Price Prediction, Facebook Prophet Model, Hash Algorithm, Litecoin, Machine Learning, Time-series Forecasting Model.

INTRODUCTION

One of the common new financial assets is crypto-currencies. Even though their exchange rates and market capitalization have experienced many drastic ups and downs over the last decade, following the appearance of the first cryptocurrency, namely Bitcoin [1].

At the beginning of 2017, the overall market capitalization of Crypto-currencies amounted to $15.6 billion; it was nearly $230 billion at the beginning of 2020 and the maximum market cap hit almost $860 billion in mid-2018.

A contentious and debatable issue is the role and place of Crypto-currencies in the global financial market. Large fluctuations in their rates and the legal complexity

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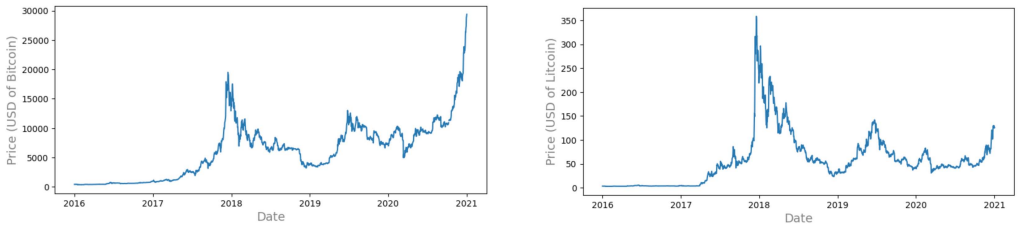
of the deals made for them in the majority of countries are creating significant uncertainty and, as a consequence, a high risk of the money being spent. Prediction of prices for cryptocurrencies, but they concentrated only on small but popular cryptocurrencies such as Monero and Ethereum. But other coins can be broadly accepted by financial institutions, such as Litecoin, Bitcoin, and Stellar. In the top 10 currencies, Litecoin is located [1]. They have the potential to be broadly embraced by financial institutions. The price history of bitcoin and litecoin are shown in Fig. (**1**).



(A) (B)

Fig. (1). Price History of (a) Bitcoin (b) Litecoin [1].

Due to its non-traceable and analytical transactions, the coin is branded as a privacy measure. Because of this property, their demand is very likely to grow in the future. This paper is designed to attack these cryptocurrencies and provide a suitable market prediction scheme [1, 2].

RELATED WORK

We prepared a comparative analysis of papers as shown in Table **1**.

Table 1. Comparative Analysis of Papers [3 - 12].

Study	Features	Finding
Applied of feed-forward neural network and FB Prophet Model for train passengers forecasting [3]	Data collected on Java Island from January 2006 to August 2019 are the data collected every month by train passengers.	Accurately predict the number of passengers
Using the Facebook model of air temperature estimates and long-term memory [4]	Five-year daily Bandung air temperature forecast	Prophet improves at the highest air temperature and LSTM improves at the lowest air temperature.
Models are used for price prediction and analysis [5]	Focused on a popular cryptocurrency for example Bitcoin	Two series of deep learning approaches and demonstrated their effectiveness in predicting bitcoin prices.

(Table 1) cont.....

Study	Features	Finding
GRU Prediction scheme [6]	Used the mean root squared error to study and compared various approaches (RMSE).	Model GRU with repeated dropout is better than established common models
Bitcoin Price Prediction using Machine Learning [7]	Forecasts 30 days ahead	Compare three separate neural networks: the FNN, the Exogenous Input Network, and the Nonlinear Autoregressive Neural Network (NARX), by obtaining the expected results of each model.
Evidence from a quantile cross-spectral approach [8]	Formulates and bond markets between 2011 and 2019	Support the idea that in some return quantiles Bitcoin will have financial diversification
Improving Stock Price Prediction with GAN-based Data Augmentation [9]	The prediction of price series stock data using GAN produced increased time-series data	24.47% of AMZN and 30.27% of lower RMSE, 15.84% of B, and 13,88% of lower RMSE and MAE.AMZN data collection
Prediction of Bitcoin prices with machine learning methods using time-series data [10]	For different window lengths filters with different weight coefficients are used.	A 10-fold cross-validation approach is used for building a model during testing.
Crypto-Currency price prediction using Decision Tree and Regression techniques [11]	Until the present date, the dataset is taken with open, high, low, and close Bitcoin value price information.	Compared the accuracy of the Bitcoin prediction with various ML algorithms.
Bitcoin Price Prediction Using Machine Learning Methods [12]	Kaggle Bitcoin Dataset 2010-2019 data set	Accuracy rates are 97.2%.

MATERIALS AND METHODS

This research will be based on the Fb prophet which is an open-source library provided by Facebook. The architecture of the Fb Prophet is shown in Fig. (**2**). It is used for Machine Learning Model. It is a Model which has opened for additivity, primarily in the Time series. Users use Prophet to forecast revenue and buy-back prices. The prophet is a method that has been using for Time-series Data.

It is open-source software released by Facebook's Core Data Science Team.

DATASET USED

Dataset Description and Preprocessing of Data: The data used for the analysis was collected by Yahoofinance.com. It is an online forum for analyzing and providing global financial market statistics. Data have been collected for the two cryptocurrencies Litecoin and Bitcoin. The regular opening price, highest price,

lowest price, and closing price for Bitcoin are formatted in a standard format. We have removed the null columns from the CSV files.

A. Types Of Cryptocurrencies Used.

B. We used Litecoin and Bitcoin as shown in Table **2**.

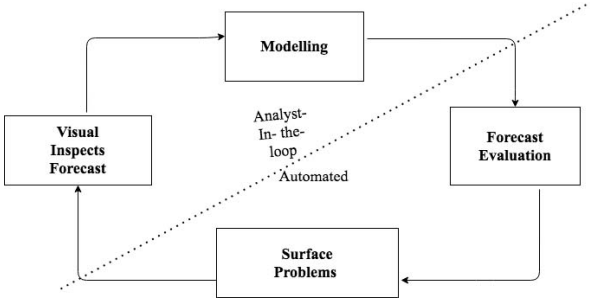


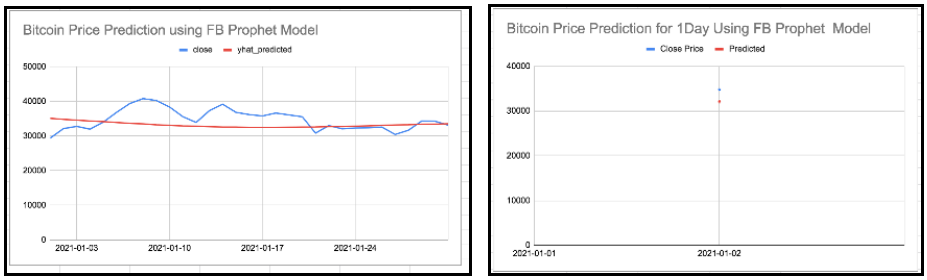
Fig. (2). Architecture of Facebook Prophet.

Table 2. Cryptocurrencies Used [13, 14].

Name	Duration	Size
Litecoin	January 1, 2016 - January 1, 2021	1829 rows × 7 columns Data points
Bitcoin	January 1, 2016 - January 1, 2021	1829 rows × 7 columns Datapoints

RESULTS AND DISCUSSION

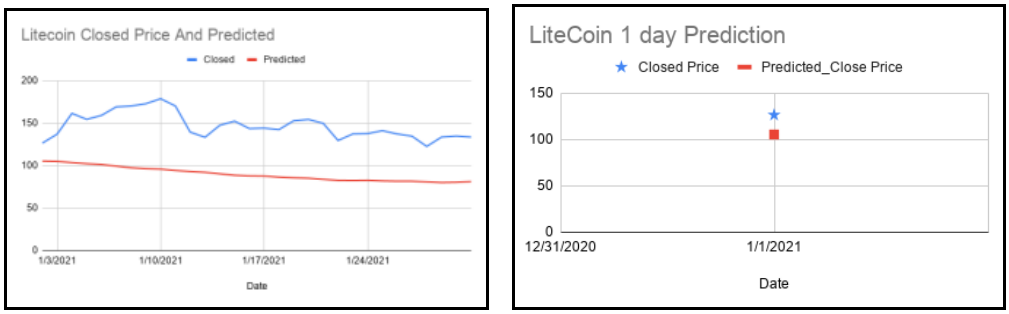
The Studies aim to test Facebook Prophet Machine Learning Model on the python notebook platform while it is possible to forecast Bitcoin's price behavior. Our model explicitly shows the superior results of Bitcoin Currency (USD) than Litecoin as shown in Fig. (**3**).



(a) (b)

Fig. (3). Prediction of Bitcoin (a) 30 Days (b) 1 Day [13].

As shown in Fig. (**4**), the 30Day and 1Day Price forecast with the help of the variable Date and Close Price of Bitcoin in the above figures (USD). The 30 and 1Day prediction is presented in other figures.



(a) (b)

Fig. (4). Prediction of Litecoin (a) 30 Days (b) 1 Day [14].

CONCLUDING REMARKS

This paper describes a Bitcoin Prediction Time Series Facebook Prophet Model. For the potential cost of two main coins, *i.e*. Bitcoin and Litecoin, we use a yahoo financing data collection. The dataset consists of 7 columns, including the stock price from the year 2016 to 2021. The open, high, low, close, and close columns constitute Bitcoin's closing price. After the FB Prophet model has been developed and trained, we have downloaded a test data set and added it to our trained model and a line map shows how the real bitcoin price is expected. Compared to Litecoin prediction, Bitcoin prediction was close to the actual price when we used the Facebook prophet model for 1 day and 30-day prediction. This model can be used to predict the price of Bitcoin and Litecoin that helps the dealer to invest and earn profits.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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Declared none.

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