Cryptocurrency Investment Advisory using Auto-TS and different trading strategies

Ganesh C Revanth
Computer Science and Engineering (C.S.E)
PES University
Bengaluru, Karnataka India
mailto:ganeshcrev@gmail.com

Joseph Alwin Kulathara Ajimon
Computer Science and Engineering (C.S.E)
PES University
Bengaluru, Karnataka India

mailto:alwin.joseph0505@gmail.com

Om Divyatej
Electrical and Electronics Engineering (E.E.E)
PES University, Bengaluru, Karnataka India
ohmbrock42@gmail.com

I. Project Abstract — In the following paper, we try to make a platform which will help users to make investment decisions based on our predicted Bitcoin price and the corresponding profit and loss with that investment. We only provide suggestion and don't present ourselves as financial advisors. We try to predict Bitcoin price with significant accuracy using parameters and constraints that affect the value of Bitcoin cryptocurrency in the long and short term in the cryptocurrency market. In the first part of this research, we try to understand Bitcoin and the various nitty-gritty surrounding it. We also try to explore different trends in Bitcoin price activity and understand and gain insights into optimal features along the way. In the latter part of the paper, we'll predict the price activity of Bitcoin and try to determine the next price point of the coin.

II. Keywords—Bitcoin, Investment, Advice, Suggestion, Crypto Currency.

III. Paper Introduction

A. Cryptocurrency - Bitcoin

It is a cryptocurrency used to make digital payments globally with significant less remittances costs. Bitcoin users are given a unique address, also known as the wallet address, which act as the sending and receiving endpoint for a bitcoin transaction. Bitcoin was supposedly founded by Satoshi Nakamoto in 2009, since then it has seen tremendous growth over the years, trading and breaking all-time highs every year.

The basis of Bitcoin is decentralization. It is not run by an individual and hence it prevents corruption. Trust is built using the blockchain technology which prevents tampering of data and make the transactions extremely secure. The data on blockchain is encrypted. But it is also important to note that bitcoin should be available on exchanged which are centralized for them to be converted to fiat.

B. Prediction

Bitcoin prices are extremely volatile which makes them a risky asset for investment. Nevertheless, with proper technical knowledge and market analysis, risks can be mitigated and potential of huge investment returns is probable. Prediction forms a major chunk for investment decisions and important tools need to leveraged to bring accuracy to satisfactory level. Prices for long term can be predicted through machine learning, while trading strategies like RSI, MA, Bollinger Bands can be used for making quick investment decisions in the short term.

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IV. Literature Survey

Bitcoin is a very famous cryptocurrency and being the first cryptocurrency to come to light, it has got a few price prediction models already.

[1] mentions the way to predict the prices of a coin efficiently in the future is to perform both short term predictions(months) and long-term predictions (At least 2 years);

[2] specifies about Price prediction techniques like 'root mean squared method' and 'Standard deviation' which can be used to predict the prices of the required cryptocurrency;

[3] helps to deal with interpreting the trades, by employing an algorithm using which each of the cryptocurrency can be evaluated.

Mentions about various market where we can obtain the APIs like Bit stamp, bit Flyer, Bitfinex, OKCoin, Huobi and BTCC.

[4] Demonstrates how to encode and extract the API's from various trustable Exchangeable markets,

For predicting the price variations of any cryptocurrency there is a need to consider methods like

"Price Movement", "Data Mining", "Intelligent Computing".
[5] Deep learning technique like LSTM* can be used for Bitcoin Price predictions because of its efficiency,
Using the Formulae of "Root Mean Squared Error" and "Mean Absolute Error"

V. PAPER FLOW

The first phase of the paper talks about collection of databases. Obtained values from two different sources, one from Yahoo Finance and second from financialmodelingprep.com. Yahoo Finance gives us data for 5 years which we combine with Auto TS and predict output price for the long term, else using a trading strategy RSI to predict output price for short term. Acquiring the time series data on a daily basis for five years at different time instances and there is a need to normalize it.

Selecting the parameters is the next step of the process since there is a need to feed the parameters to the network. The selection is from an array of features which are mentioned below:

1. **Start Date**: The date which we will use for getting historical data starting date for last five years.
2. **End Date**: The date which we will use for getting historical data ending date for last five years.
3. **Closing Price**: The price of Bitcoin at the end of each day.
4. **High Price**: The highest price of Bitcoin achieved during the day.
5. **Low Price**: The lowest price Bitcoin slumped down to.

Sample inputs would be fed into the AutoTS model following the process of selecting the features. The main aim is to consider the Bitcoin Values as a particular Pattern. The pattern varies from end to end like it maybe going-down, up or consolidating at a certain margin based on the behavior of the markets.

We will use the data from financial modelling prep and analyze and calculate the gain-loss for each day for the period of over 5 years using RSI. The gain loss will then be passed to AutoTS which will then predict the short-term profit.

VI. WORK AND RESULTS

Collecting the Database is considered to be the first step of Bitcoin Prediction. As per the project demand we have obtained the database from the following sources:

A. Yahoo Finance

Yahoo finance has a vast network and database of financial assets, like crypto, stock, oil, and other commodities as such. Yahoo finance has an API service wherein developers can access real-time of various markets such as like crypto, stock, oil, and other commodities as such. It also gives us the opportunity to download CSV files for the data for the same, which proves very useful for training large amounts of data.

B. financialmodelingprep.com.

Financial Modelling is a website wherein we can access financial data ranging from market prices to a company' earnings and reports, which proves very useful for sentiment analysis, if applied. Realtime data is achieved through API requests and all requests are extremely secure, owing to the risk of exploiting of financial data.

Strategies implemented:

C. *Relative Strength Index* (RSI)

RSI is an indicator used in different trading strategies when the market, crypto or stock, has momentum. The analysis of RSI is simple. The trading segment is divided into 100 to 0, with 100 being at the top and 0 being the bottom. A middle line cuts through the intermediate values, generally 70,which indicates the points at which trades should take place, either long or short.

RSI can be calculated as shown:

- $RSI = 100 - (100 / (1 + R.S)$

Where ***R.S*** is:

- $R.S = AG / AL$

AG- Average Gain

AL-Average Loss

D. AutoTS

AutoTS is a time series package for Python designed for rapidly deploying high-accuracy forecasts at scale.

We have successfully achieved bitcoin predicted price for the next 3 months for the long term, by training the model on AutoTS and obtained relevant graphs. We have also calculated short term profit using RSI strategy by feeding a pattern of daily gains and losses by considering the data of 2 years for each day, after which we give suggestions and relevant advice to the users.

VII. PROPOSED WORK AND MODELS

A. Using AutoTS

It is an open-source python library basically, used to automate Time Series Forecasting.
It will automatically train multiple time series models using a single line of code, which will help us to choose the best one for our problem statement.

In the python open-source library Auto-TS, auto-ts. Auto Timeseries () is the main function that we will call with our train data. We can then choose what kind of models we want such as stats, ml, or FB prophet-based models. We can also tune the parameters which will automatically select the best model based on the scoring parameter we want it to be based on. It will return the best model and a dictionary containing predictions for the number of forecast periods.

Important: The dataset should have a time or date format column.

Why AutoTS?
It is based on Time series forecasting and it occurs when we make scientific predictions based on historical time stamped data. It involves building models through historical analysis and using them to make observations and drive future strategic decision-making. Since our Bitcoin and other altcoins rely heavily on historical data with dates, it is the best suited and easily scalable without much jargon.

B. Using RSI

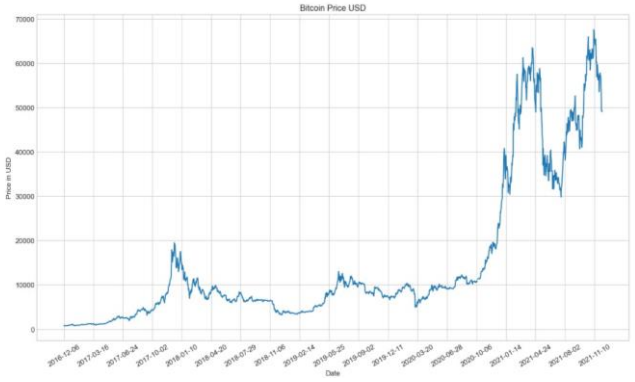
RSI is an indicator used in different trading strategies when the market, crypto or stock, has momentum. The analysis of RSI is simple. The trading segment is divided into 100 to 0, with 100 being at the top and 0 being the bottom. A middle line cuts through the intermediate values, generally 70, which indicates the points at which trades should take place, either long or short. If the corresponding trading line crosses 70, the asset is considered overbought and if the corresponding trade goes below 30, the asset is considered oversold. Both the values signal the traders to take a position, if below 30, go long, if above 70, go short.

RSI(I)
=100− [1+ (**A.L**)/
(**A.G**)] *100

RSI(II)
=100−[1+((**PAL**×13) + Current Loss)
*(**PAG***13) + **C.G** *100]

where,
A.L = Average Loss
A.G = Average Gain
C.G= Current gain
PAL= Previous Average Loss
PAG= Previous Average Gain

Why RSI?
RSI indicator works on the principle of momentum, which means it captures the speed of the market in which the market is moving. The asset can be overbought or oversold for a long period of time if the indicator is above 70 or below 30 respectively. It gives traders enough opportunity to go long or short for that period of time since momentum increases in one direction only for a particular time.
Therefore, RSI works best in markets where price points fluctuates between high and low.



VII. Conclusion

The most popular Way of investment is Cryptocurrency and the most important virtual Currency is Bitcoin. This project which has been created by us is a small effort towards encouraging young and new investors to invest without the mediation of any third-party companies.

AFFIRMATION

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REFERENCES

[1] Bitcoin Price Prediction using Machine Learning‖, Siddhi Velankar*, Sakshi Valecha*, Shreya Maji* *Department of Electronics & Telecommunication, Pune Institute of Computer Technology, Pune, Maharashtra, India409-415.

[2] A Research on Bitcoin Price Prediction Using Machine Learning Algorithms || Lekkala Sreekanth Reddy, Dr.P. Sriramya, INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH VOLUME 9, ISSUE 04, APRIL 2020.

[3] Cryptocurrency Transactions Advisor Using a Genetic Mamdani-type Fuzzy Rules Based System || Taiguara Melo Tupinamb´as, Rafael Aeraf Le˜ao, Andr˜e Paim Lemos

[4] Bitcoin Realtime price monitoring on several Cryptocurrency markets using Web API, Telegram Bot || Risky Parlikaa, Virya Aatmaja, Informatics, University of Pembangunan, Indonesia.

[5] Price Prediction of Bitcoin and Deep Learning Model Analysis || Temesgen Awoke Muniye, Minakhi Rout, kiit University, Suresh Satapathy, Institute of Electrical, electronics Engingineering.