



Bitcoin Price Prediction Using Machine Learning Algorithms

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Abstract. The past several years have seen an increase in interest in trading that is supported by machine learning and artificial intelligence. Utilize automated trading with the aid of machine learning and artificial intelligence to reap the maximum rewards from the cryptocurrency market. For a specific time, we keep the daily data. We achieve excellent results by utilising tactics supported by cutting-edge algorithms. The results produced the expansion in the crypto currency industry with the aid of straight forward architecture and algorithms. The rise in market capitalization has led to a rise in popularity for the cryptocurrency in 2017. Today's market involves more than 1500 crypto currencies. For usage in online transactions, the crypto currency can be created. A crypto money technology is bitcoin. Bitcoin's value changes constantly, second by second. As a result, we apply machine learning architecture to forecast the value of the bitcoin price in this case. We are working to demonstrate that, in comparison to previous techniques and architectures, this ML architecture produces results that are more accurate. Our study use the Support Vector Machine(SVM) and K Nearest Neighbor(KNN)algorithms to successfully forecast bitcoin prices. The findings demonstrate that the Support Vector Machine(SVM) method outperforms the K Nearest Neighbor(KNN) method as it is currently being used.

Keyword: Bitcoi · machinelearning · KNN · SVM · dataset · classification · regression · prediction · accuracy

1 Introduction

Bitcoin and other digital currencies are commonly used for speculative or advanced payment purposes. For instance, Bitcoin is decentralised because no one owns it. Because they are not limited to a single nation, bitcoin exchanges are simple. Through a number of commercial venues referred to as “bitcoin trades,” speculation ought to be accessible. These allow users to trade bitcoins for a wide range of foreign currencies. The most Bitcoin is traded on Mt. Gox. Bitcoins are stored in a smart wallet that works like a virtual bank account. Block chain is a database that keeps track of various transactions' dates and records. In a block chain, a square stands in for each record. Each informational

square includes a link to the preceding tile. Data on the blockchain is encrypted. During exchanges, only the customer's wallet ID is made visible; their name is not. Similar to a stock, Bitcoin's value fluctuates, but in a strange way. Digital currencies like Bitcoin are used all around the world for speculation and advance payments.

For instance, Bitcoin is decentralised because no one owns it. Given that they are not bound to any certain nation, bitcoin exchanges are simple. Through several business hubs known as "bitcoin exchanges," speculation should be possible. These allow users to trade bitcoins for a wide range of foreign currencies. The most Bitcoin is traded on Mt. Gox. A smart wallet, which functions like a virtual bank account, is where bitcoins are kept. The block chain is the repository for the timestamp data and the records of a significant number of deals. In a block chain, each record is represented by a square. Every informational square contains a reference to a previous tile. On the blockchain, data is encrypted. Only the wallet ID of the customer is made visible during exchanges; their name is not.

Like a stock, Bitcoin's value changes, but in an unexpected way. Using information from financial trades and a range of calculations, value is forecasted. But Bitcoin is impacted by peculiar variables. Forecasting the value of Bitcoin is crucial for making the best business decisions. The price of bitcoin is unaffected by governmental intermediaries or changes in the economy, in contrast to a stock market. Therefore, we consider it crucial to estimate the value of Bitcoin using cutting-edge AI technology.

2 Literature Survey

New technologies and methods have emerged as a result of the Internet's exponential access development. One way that the Internet is replacing the conventional monetary system as a means of exchange is through the use of cryptocurrencies. Cryptocurrencies, also known as digital or virtual currencies, are used to trade or transfer assets over a network of computers. In a brief period of time, the market for cryptocurrencies has grown exponentially. In 2009, the moniker "Bitcoin" was given to the first cryptocurrency.

Decision Tree and Regression Techniques for Predicting Cryptocurrency Prices Karunya Rathan; Somarouthu Venkat Sai Tubati Sai Manikanta Publisher: IEEE 2021. In the first part of the study, the price trend on daily variations in the price of bitcoin is detected while providing information on price trends for bitcoin [1].

Using machine learning, predict the price of bitcoin Siddhi Velankar; Sakshi Valecha Shreya Maji Publisher: IEEE 2021. In this essay, we make an effort to forecast the price of bitcoin with some degree of accuracy while taking into account many factors that influence its value [2].

Deep Learning and Neural Networks for Prediction of Cryptocurrency Prices Toby Biswas; Mohandas Pawar; IEEE 2021. Because digital currencies have such a broad price range, it is essential to have solid planning when attempting to estimate the price of a given currency [3]. Short-Term Cryptocurrency Price Movement Prediction Using Centrality Measures Kin-Hon Ho; Wai-Han Chiu; Chin Li Publisher: IEEE 2021. In this essay, we make an effort to forecast the price of bitcoin with some degree of accuracy while taking into account many factors that influence its value [4].

Ether Price Prediction Using Advanced DeepLearning Models Agis Politis; KaterinaDoka;Nectarios Koziris Publisher: IEEE 2021. Although several re-search initiatives have been made to create systems that can accurately fore-cast price fluctuations in the bitcoin market, they show substantial efficiency gaps, which this study further analyses [5].

3 Proposed Methodology

The proposed system includes the algorithms such as KNN and SVM that are used to predict the prices of Bitcoins and giving best accurate results for the future value of crypto currencies.

Even so, there are some unanticipated fluctuations in the value of the Bitcoin. On financial exchange data, different calculations are used to predict value. However, Bitcoin is affected by some unusual factors. This research aims to determine the precision with which machine learning techniques can forecast the direction of Bitcoin price. Fundamentally, this is a time series prediction issue. Although a tonne of study has been done on the application of different machine learning techniques to predict time series, that hasn't been much done in this area specifically on Bitcoin. Furthermore, because it is still in its infancy compared to other currencies like the USD, Bitcoin is much more unpredictable. In order to predict the price of bitcoin based on the taken into account and further described historical data, we used the SVM and KNN machine learning algorithms.

3.1 Machine Learning Algorithms

A branch of computer science and artificial intelligence (AI), the study of machine learning seeks to pretend human learning processes through the use of data and algorithms, gradually improving the results' accuracy. Machine learning is a vital part of the developing field of data science. Data mining projects use algorithms that have been statistically taught to make classifications or predictions. The decisions made as a result of these insights affect key growth metrics and are then used to fuel applications and companies. Big data's continued growth and expansion will drive up demand for data scientists, who will be required to assist in identifying the most crucial company issues, as well as the data required to address them. Machine learning relies on input, such as training data or knowledge graphs, in a similar way to how the human brain learns information and develops understanding in order to grasp entities, domains, and the connections among them. Deep learning cannot begin until entities are defined. The first step in machine learning is observation or data, such as samples, first-hand knowledge, or instructions.

K-Nearest Neighbor:

The key details in remote sensing images can only be recovered once they have been accurately classified. It is essential to use classification to take the fine information out of an image for further processing. This study shows that active learning methods were utilised to determine the best classifier in hyper spectral images and that KNN techniques were evaluated in those images. The best classification method has recently been a hot topic in academia. The K-nearest neighbourhood technique is frequently used to classify

photographs. In order to combine the location using the greatest margin classification, a better KNN is used for high resolution remote sensing. A synthetic immunological B-cell network and KNN are used to demonstrate how processing can be done with less data.

As an illustration, imagine that we have a picture of a creature that resembles both a cat and a canine, but we are unsure of its identity. It is therefore possible to identify these objects using the KNN technique, which is depending on a similarity metric. Our KNN model will search for similarities between the traits of the new data set and those are the images of cats and canines and, in accordance with those similarities, it will categorise the new data set as cat- or dog-related.

Feature Selection.

By employing only pertinent data and obtaining a noise-free grid of input data. It is a technique for decreasing the input variable in our model. It is the process of automatically selecting pertinent characteristics for our machine learning model and solving every issue according to the kind of machine learning algorithms you utilised in your model.

Support Vector Machine(SVM).

The SVM's main objective is to search the appropriate hyperplane in a high-dimensional space under various conditions. Numerous hyperplanes can realise this paradigm. In this approach, the support vector is applied to the data that is closest to the closed surface and the optimum choice surface. In order to accomplish classification, a hyperplane is created to partition the data, and the input vectors are then planned into a high dimensional space. Most non-convex, unconstrained minimization issues as well as quadratic programming issues can be solved using this method. The most efficient method for developing classifiers is the SVM (Fig. 1).

3.2 A Comparison of the Proposed and Existing System

In this work, the KNN and SVM algorithms are used to accurately predict the price of bitcoin. The outcome demonstrated that the proposed SVM performs better than the current KNN. The main flaw in the current system is its lack of accuracy, but with the suggested method, prediction accuracy is good (Fig. 2).

4 Working Architecture of Proposed Methodology

4.1 Modules Description

1. Dataset Input.
2. Dataset Analysis.
3. Oversampling (using SMOTE).
4. Training and Testing Subset.
5. Using the algorithm.
6. Making Predictions about Outcomes.

1. Dataset Input:

You can get the dataset from an online data provider using online resources. In order to accurately estimate the accuracy, we must amass a sizable collection of data.

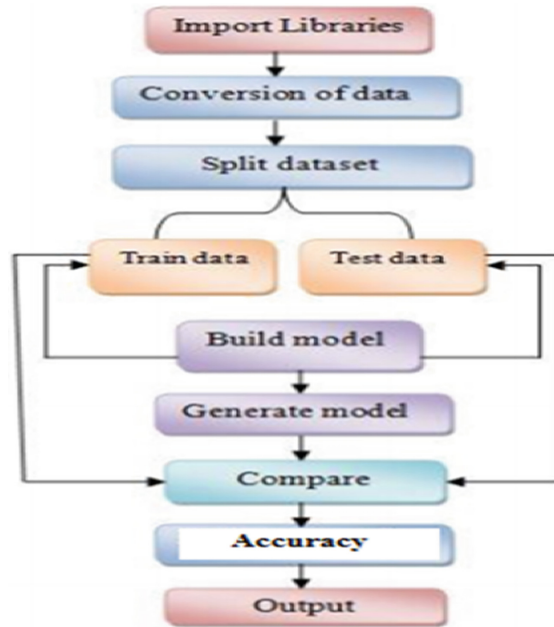


Fig. 1. Process of Proposed Model

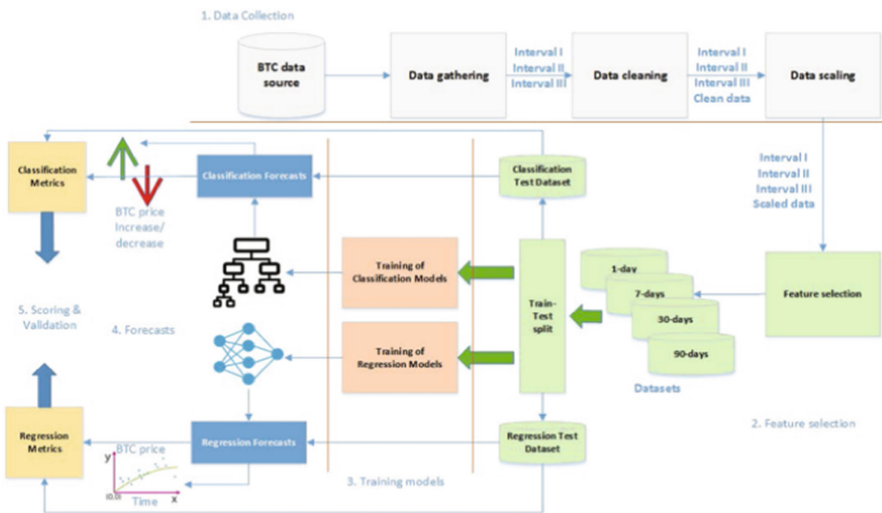


Fig. 2. System Architecture

2. Dataset Analysis:

This Section Contains Dataset Analysis. For the Data Processing, the Data Size is Taken into Account.

3. Oversampling (Using SMOTE):

We Have Compiled a Thorough History of All day today’s Bitcoin Prices Over a Significant Period of Time.

4. Training and Testing Subset:

Many Classifiers Exhibit Bias for Majority Classes Because the Dataset is Unbalanced. Minority-Class Characteristics Are Dismissed as Noise and Ignored. Therefore, Choosing a Sample Dataset is Suggested.

5. Using the Algorithm:

The Classification Algorithms that Were Tested on the Dataset for the Sub-Sample Are Listed Below. Knn and Svm Are Two Examples.

6. Making Predictions About Outcomes:

The Training Model is Used with the Test Subset. Accuracy is the Metric that is Utilised. The Desired Outcomes Are Obtained Once the ROC Curve is Displayed.

5 Result

The Fig. 3 shows the Bitcoin price is predicted by algorithms namely KNN and SVM in terms of accuracy. From the result its proved that proposed system SVM works better than existing KNN.

Here the Fig. 4 shows how the machine learning algorithms (KNN & SVM) gives an accurate results for the future value of Bitcoin in 30 days.

The minimal price of Bitcoin projections for the forthcoming days are provided Fig. 5, and the actual value we anticipated for that specific days is also included in the below figure. This is based on an analysis of the values of Bitcoin in previous years. The Fig. 5 only applies to our dataset because it is based on data from prior years.

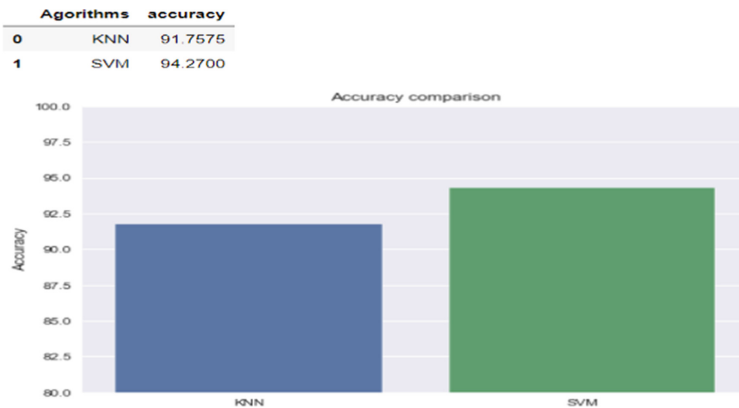


Fig. 3. Accuracy Comparison of SVM & KNN

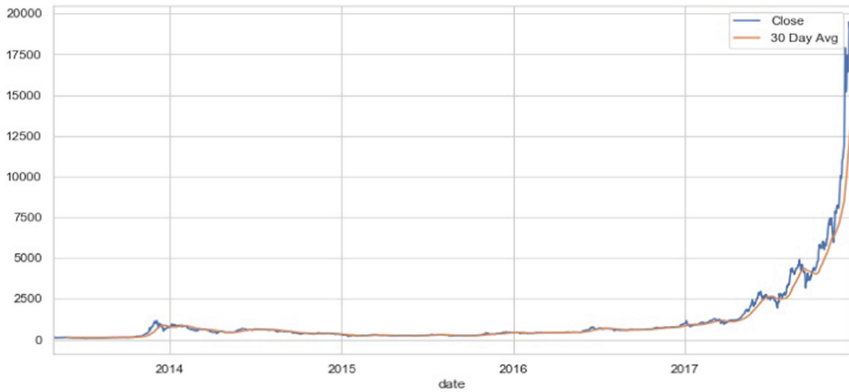


Fig. 4. Bitcoins Price History

The prediction is: 607.1487500000002 But the real value is: 607.15

Fig. 5. Prediction Value

6 Conclusion

The finding of this investigation lead us to the following conclusion:

Recently, we integrated a different types of machine learning modules for the purpose of predicting bitcoin price. Find out how accurate SVM and KNN are looking at the comparision table of ML algorithm model corretness. SVM and KNN are shows to be the most efficient algorithms in terms of reducing time complexity when using the ML algorithm to predict bitcoin price. The techniques in machine learning will improve the idea of a cryptocurrency feature. As a result, investments in globules will appreciate in value. In this study, we developed a fresh method to judge the accuracy of the feature pricing. This boosts revenue and customer expansion.

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