Chapter 14
Potential Market-Predictive Features Based Bitcoin Price Prediction Using Machine Learning Algorithms

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ABSTRACT

Bitcoin is a type of digital currency or computerized money that is utilised for speculation around the world. Bitcoins are files that are saved in a digital wallet programme on a mobile phone or a PC. Every transaction and its timestamp data are recorded in a common list known as blockchain. In this research, the cost of bitcoin is estimated utilising data mining techniques and machine learning algorithms. The dataset is preprocessed with the use of data mining algorithms, which reduces data noise. Bitcoin's price fluctuates, and it is estimated using long short-term memory (LSTM), a type of neural networking, to extract acceptable patterns for modelling and prediction. Discovering recurring patterns in the bitcoin market is a necessary endeavour in order to achieve optimal bitcoin price functionality. The dataset consists of numerous regularly reported bitcoin price features every year. Linear regression (LR) technique is used to estimate the future cost of bitcoin. Daily price shift with the best possible precision by using the available data is also estimated.

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INTRODUCTION

Bitcoin is a type of virtual currency that is commonly used in transactions and investments. Bitcoin is a decentralized money, which means that no single person or group owns it. Bitcoins are easy to use because they are not tied to any particular jurisdiction. The best approach to invest in bitcoins is to use a bitcoin exchange. Individuals can buy and sell bitcoins with a number of different currencies. Unlike traditional market assets, cryptocurrency markets are extremely volatile, and while they share many of the characteristics of traditional stock markets, they are extremely unstable. These marketplaces are indeed decentralized, unregulated, and prone to manipulation. Many entrepreneurs are now investing in blockchain, the well-known technology that underpins the most famous cryptocurrencies (Antonopoulos, A. M., 2017) including bitcoin, and this number is expected to rise as bitcoin's utility grows. Understanding how bitcoin works is crucial to comprehending why it would be so popular. Cryptocurrency, unlike conventional investments, is not linked to tangible assets or the US dollar. Its fundamental objective is to encourage two people in any location to directly exchange value. This indicates that the network is not controlled from a central location. There is no central bank or government that can stop down the system or arbitrarily boost or drop the value (Mehmet Balcilar et al, 2017) emphasized the modelling non linearity and accounting for tail behavior when exploring causal relationships between Bitcoin returns and tradingvolume, and that volume cannot help predict bitcoin price fluctuations at any point in the conditional distribution.The extent to which central banks begin to digitize their own currency will be intriguing to watch. Bitcoin is becoming more widespread as financial systems grow more computerized, but the digital currency's comeback is also linked to the state of global banking. (Rathan, K et al, 2019) Bitcoin-related technical considerations include the size of the blocks, confirmation time, amount of transaction, hash rate, profitability of mining, complexity, frequencies of transaction, and market capitalization. They calculate consumer interest through tweets and Google patterns. Bitcoin-related economic determinants are macroeconomic measures and foreign currency ratios.

The Long Short-Term Memory that uses the predictors has passed all the Model Confidence (MCS) tests. According to the technical viewpoint, the transaction fee's average is a good indicator of the exchange rate of bitcoin because it still surpassed 0.75. The LSTM using the predictors had higher mean maximum and minimum values. According to the analysis of sensitivity, the variables having a score of lower than 0.6 were excluded using the crossover approach and possible predictor's ranges are generated. According to (Ferdiansyah, F et al, 2019) a new predictive paradigm for cryptocurrency prediction models can overcome and enhance the challenge of input variable identification in LSTM without tight data assumptions. The findings highlighted its potential application in cryptocurrency prediction, as well as other industries like as healthcare data and financial time-series data. The remaining part of the paper is laid out as follows: The second section discusses relevant studies and methods for predicting bitcoin prices. The proposed system model for bitcoin price forecasts are shown in Section 3. The implementation of the prediction model is presented in Section 4. The suggested model's performance is evaluated in Section 5. Finally, Section 6 concludes the paper.

RELATED WORK

Many researchers have given their opinions about the bit coin prediction in terms of algorithm and framework. In this section, those topics were given in detail. To begin, (Mahar, K et al, 2021) have