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Cryptocurrency Price Prediction System

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Abstract A cryptocurrency is considered as a virtual currency, its price is depends on demand and supply of the currency. There are so many different virtual currencies are available on the internet, some of them are bitcoin, lit coin, Ethereum etc. using services from cryptocurrencies can affect the international relation and trade due to its highly volatile price. In our project, we focus popular cryptocurrency, Ethereum.
Among the many types of virtual currencies, Ethereum is widely accepted in different fields such as investors, researchers, traders, and policy makers. As far as we know, Our goal is to implement efficient prediction models based on deep learning, using different algorithms such as LSTM, ARIMA, SARIMAX, XGboost, FB prophet, to and compare them to find out the best accuracy model for predicting cryptocurrency price.

Keywords: prediction, Ethereum, cryptocurrency, deep learning

I. INTRODUCTION

Ethereum is a type of cryptocurrency that has made significant technological advancements in the world of digital marketing. Although virtual currencies cannot completely replace traditional currencies, they are gaining popularity worldwide due to their innovative features such as transparency, simplicity, and growing acceptance. As of April 19, 2019, the market capitalization of virtual currency was around $90 billion, but it is subject to fluctuation. Bitcoin is a peer-to-peer cryptocurrency that allows all transactions to occur without regulation or control from a third party. The Bitcoin market operates 24/7, and its capitalization increases over time. However, the high price volatility of Bitcoin's exchange rates presents a challenge to accurately predict its price. To forecast future Bitcoin prices and build trust and acceptance worldwide, it is essential to understand the factors that influence its economic role and international relations. Factors such as a country's political system, public relations, and market policies may affect Bitcoin's market strategies. The lack of an official roadmap for Bitcoin trading platforms presents a significant challenge for investors and policymakers. To minimize risk and increase efficiency, our research aims to use deep learning models to predict Bitcoin prices.

II. OBJECTIVE

1.Ethereum price prediction with maximum efficiency using LSTM and ARIMA.
2. Compare ARIMA, SARIMAX, FB PROFET, XGC REGRESSIVE and LSTM to find the most efficient algorithm for predicting cryptocurrency prices.
3.Guarantee lower risk and higher profit for investors.

III. RELATEDWORK

The use of machine learning for cryptocurrency predictions, especially deep learning models, has not been extensively researched. However, some research exists, with over 600 articles published on the subject as of 2016. Our literature review focuses on the use of different techniques for Bitcoin (BTC) price prediction, recurrent neural networks (RNNs), and their evaluation and system architectures. We also employ feature selection mechanisms to identify the most critical features and apply various machine learning methods. Our primary focus is on predicting the fluctuating value of Bitcoin through sentiment analysis and examining the relationship between positive and negative sentiments. For example, Necessitate et al. have proposed the use of a machine learning algorithm, Long Short-Term Memory (LSTM), for future stock price prediction. They specifically focus on time-series forecasts, which are the basis of stock price and other financial forecasting models. Compared to the existing ARIMA model, the LSTM algorithm provides more efficient and accurate results. Ross et al. have also conducted research on Bitcoin, focusing on enabling peer-to-peer transactions of bitcoins through the network and blockchain technology, and using various machine learning algorithms to predict Bitcoin prices more effectively. In our research, we create four different models using LSTM, ARIMA, SARIMAX, XG-Boost, and FB Prophet to determine which model provides the most accurate predictions

IV. LITERATURESURVEY

In today's business and commerce, online reviews play a significant role in decision-making when it comes to purchasing products. However, some opportunistic individuals or groups try to manipulate product reviews for their own interests. To address this issue, this paper

introduces semi-supervised and supervised text mining techniques to identify fake online reviews and contrasts the approaches of both techniques on a dataset of reviews. The challenge with identifying fake reviews is that fake reviewers can craft their reviews to appear genuine, making manual labeling of fake reviews challenging. Therefore, the use of corresponding or nearly corresponding spam in order to expand a model that can detect fake reviews is being researched. Studies on distributional footprints have also been performed, revealing a relationship between distribution anomalies and deceptive reviews from Amazon and Trip Advisor. Fake review detection analysis mainly utilizes lexical and behavioral features, with some studies also taking into account social and temporal factors. Behavioral features such as the number of reviews, the time of device display, the location of reviews, and rating features have been advanced in several papers, resulting in improved classification models and better results.

V. PROPOSEDMETHODOLOGY

using deep learning models. The focus is on identifying important features for predicting Bitcoin prices through the application of LSTM ARIMA, SARIMAX, FB Prophet, and XG-boost. The goal is to select the most effective model based on the evaluation of each model's accuracy in predicting Ethereum prices. The forecasting process involves collecting relevant data and training the deep learning models on the dataset to make future predictions. The proposed method provides a comprehensive approach to predicting Bitcoin prices, taking into account the inherent volatility and fluctuations in the market. By leveraging deep learning models, this method provides accurate and reliable predictions that can help inform investment decisions and better understand the cryptocurrency market. fig.1

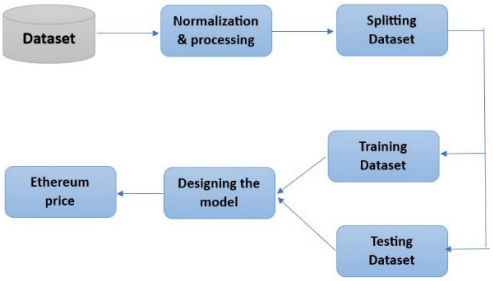
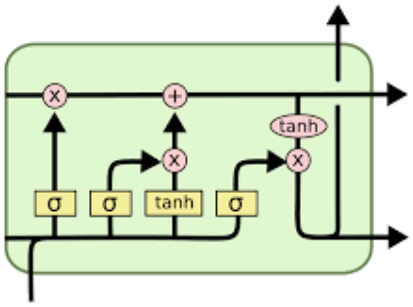


Fig 1:Showsthe Architecture oftheSystem

LSTM-
LSTM is a type of recurrent neural network that can effectively handle long-term dependency issues. Unlike other RNNs, LSTMs are designed to remember information for extended periods, making them well-suited for tasks that require learning from sequences of data. The structure of an LSTM consists of recurrent neural network modules that include memory cells and gate mechanisms. This enables LSTMs to overcome the challenges associated with vanishing gradients in standard RNNs. Due to its ability to memorize long-term and short-term temporal information simultaneously, LSTM is a highly efficient neural architecture for deep learning. The effectiveness of the LSTM architecture can be seen in Figure, where the model is shown to effectively capture and learn from complex temporal patterns in data.



ARIMA:-
Autoregressive Integrated Moving Average (ARIMA) is a statistical model that uses time series data to analyze a dataset and forecast future trends. ARIMA models make future predictions based on past values and are autoregressive in nature. The Seasonal Autoregressive Integrated Moving Average with Exogenous Factors (SARIMAX) is an extension of the ARIMA model that includes both seasonal and exogenous factors..

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SARIMAX:-
The Seasonal Autoregressive Integrated Moving Average with Exogenous Factors (SARIMAX) is an extension of the ARIMA model that includes both seasonal and exogenous factors. SARIMAX models consist of an autoregressive term, a moving average term, and an exogenous factor term.

FB prophet:-
Prophet is a time-series forecasting tool that employs additive models to predict trends and seasonality in data. It works well with time series data that has strong seasonal effects and multiple seasons of historical data. Additionally, it handles missing data and outliers effectively..

XG-Boost-
.XGBoost is an ensemble learning method that uses weak models to generate stronger predictions. It is optimized for large data sets and has achieved peak performance in various machine learning tasks, including classification and regression. XGBoost stands for Extreme Gradient Boosting, which is a popular and widely-used machine learning algorithm.

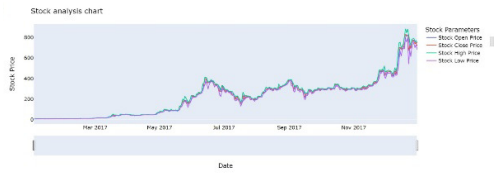
SIMULATION RESULTS AND ANALYSIS

Data preparation is a crucial step in machine learning that involves collecting, organizing, and structuring data for analysis and visualization with machine learning techniques. Accurate data input is crucial for solving problems effectively. Therefore, dataset preparation is a critical aspect of machine learning. As mentioned before, the accuracy of predictions can be impacted by data preparation, and hence, it is important to explain the dataset details in this section.

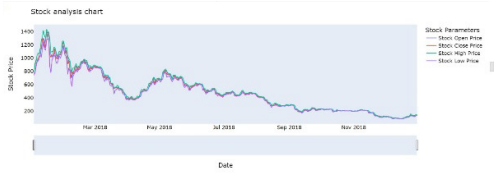
In this paper, we will discuss the methods used to prepare the data for our model. We have collected the dataset from the Kaggle website (https://www.kaggle.com), which includes daily price values for Bitcoin from January 1, 2015, to February 20, 2021. The dataset includes seven attributes, such as open price, high price, low price, close price, and market value of publicly traded shares outstanding. These attributes have been used to prepare the data for our analysis.

Stock analysis chart of 2015

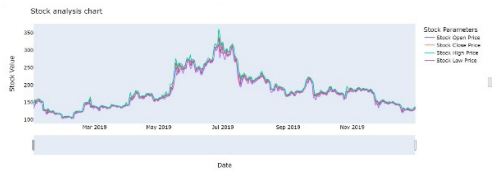
Stock analysis chart of 2016



Stock analysis chart of 2017

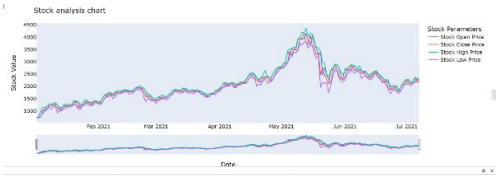


Stock analysis chart of 2018



Stock analysis chart of 2019

Stock analysis chart of 2020



. Stock analysis chart of 2021

VI. CONCLUSION

The objective of our study is to develop a more efficient and reliable method of predicting Ethereum prices for investors and policymakers by utilizing deep learning models. We employed four different models, including LSTM, ARIMA, SARIMAX, FB Prophet, and XG-Boost, to forecast Ethereum prices. Our results indicate that the LSTM model outperforms the other models in terms of accuracy and time efficiency, making it a superior choice for cryptocurrency price prediction. However, future research should consider including additional variables such as political, economic, and public relations factors that can impact cryptocurrency prices. In addition, we focused solely on Ethereum and did not analyze other cryptocurrencies such as Bitcoin, Litecoin, and Ripple. Incorporating a broader range of cryptocurrencies into the model and analyzing their contribution levels to price estimation may also enhance its accuracy.

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