Cryptocurrency Analysis using Machine Learning and Deep Learning

C. Thomas[1], Z. Watson[1], M. Kim[1], A. Baidya[1], M. Lamsal[1], M. H. Chowdhury[2], M. Basnet[3] and K. N. Poudel[4]

1. Department of Mathematics and Computer Science East Central University, Ada, OK, USA
2. Computational Science Program, Middle Tennessee State University, Murfreesboro, TN,USA
3. Department of Electrical and Computer Engineering, University of Memphis, Memphis, TN, USA
4. Department of Mathematics and Data Science, Embry-Riddle Aeronautical University, FL, USA
{minkim1, anjbai, musla, chactho1,zacrwat}@email.ecok.edu , mc7d@mtmail.mtsu.edu, mbasbet1@memphis.edu, poudelk@erau.edu

Unlike typical banking transactions, blockchain-assisted cryptocurrencies are touted as the currency of the future, allowing peer-to-peer transactions without the need for an intermediary [1]. According to investors, the crypto share market has grown significantly in terms of market capacity, increasing by 300 percent in a year to approximately 1.6 trillion dollars [2]. Crypto investments, on the other hand, are thought to be dangerous given the crypto market's extremely volatile, latent, and non-stationary nature [3]. Stakeholders and investors may be able to easily incorporate crypto into their investment strategy if they can accurately predict the temporal change of the market price over time. In order to anticipate future prices, machine learning (ML) and big data analytics are extremely effective in deciphering stochastic and nonlinear patterns within market data [4].

Cryptocurrencies are some of the most valuable and widely used currencies in the world economy, and on their own might allow users to make millions of dollars. The blockchain is used for documenting transactions between participating groups. This technology has been used in such domains as supply chains, healthcare, logistics, and identity management [5]. Cryptocurrency transactions create a large amount of data that can be used to make automated investing recommendations based on artificial intelligence (AI), data science, and big data [6]. Cryptocurrencies have a high level of volatility, which increases the dangers associated with crypto trading. Price variations are expected throughout the day, but if accurately forecast, these might allow crypto traders to make a consistent income. A large quantity of data must be processed to determine the continually changing encryption patterns, which is where AI and machine learning systems come in handy. High working speed and accuracy are the primary benefits of AI and machine learning.

Cryptocurrencies and traditional currencies both serve the same purpose, but their underpinnings are different. The elimination of the necessity for intermediate currency holders is one of the motivations for cryptocurrencies. Cryptocurrencies follow five qualities (fungible, durable, portable, stable, and recognized) as well as three money functions (Unit of Account, Store of Value, and Standard of Deferred Payment) [7]. Cryptocurrencies are a type of digital money that may be used to make more secure transactions. Traditional currency, often known as fiat currency, is controlled by the government and is thought to symbolize debt. Cryptocurrency avoids debt and measures its value in terms of what someone is willing to pay for it. Cryptocurrency is not regulated or controlled by anyone and can be used by anyone. Because it's based on a blockchain, it's nearly impossible to fake, and the transactions are mostly private.

For the simulation experiment purpose, we collected publicly available data from Yahoo Finance and Kaggle for various trending cryptocurrencies like Bitcoin (BTC), Dogecoin (DOGE), Ripple (XRP), Ethereum (ETH), and Cardano (ADA). Further, we preprocessed the data using the MinMax Scaler function and fed it into the Long Short-Term Memory (LSTM) machine learning model with a dropout rate of 0.2, 30 epochs, and a batch size of 32.

Figure 1 shows the actual price and predicted price for ETH and ADA. We observed a qualitative match between these values over 175 days. The code and plots are available in our GitHub repository where we

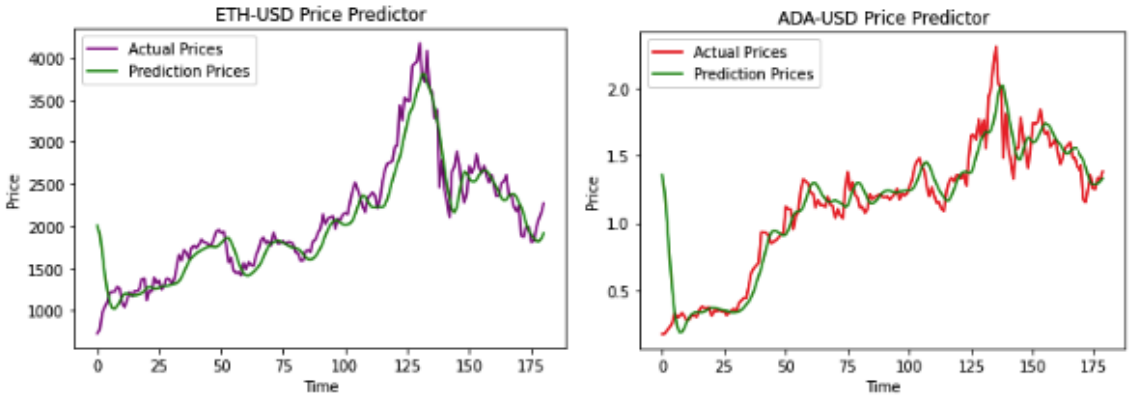

Figure 1. Actual and predicated price for ETH and ADA.

have simulations for other trending cryptocurrencies.

In addition, similar to SWIFT, cryptocurrency products can be utilized for payment settlement, asset exchange, and remittance systems. Some of them are pre-mined or have a simpler mining procedure. Huge financial institutions can use cryptocurrency because it is quickly settled, has cheap transaction fees, and can be used by large financial organizations.

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