Deep Learning for Bitcoin Prediction

Aditya Kadole
Dept of Computer Engineering
North Carolina State University
Raleigh, United States
akadole@ncsu.edu

Shreyas Chikkaballapur Muralidhara
Dept of Computer Science
North Carolina State University
Raleigh, United States
schikkb@ncsu.edu

Shrihari Sundararaj
Dept of Computer Engineering
North Carolina State University
Raleigh, United States
ssunda23@ncsu.edu

I. INTRODUCTION

Bitcoin (BTC) is an internet-based world's top ranking cryptocurrency. Cryptocurrency has grown exponentially over the past decade, with the most rapid advances seen in the past few years. It seems that everyone in the world suddenly start to talk about Cryptocurrencies. Cryptocurrencies date back to recovery days of 2008 crisis, started with lower net worth. Since then there is a steady increase in cryptocurrency base. Unfortunately, due to their lack of indexes, Cryptocurrencies are relatively unpredictable compared to traditional financial instruments. If there was right model to forecast, then investors could have have made informed decisions. The trends for Bitcoin prices is available for considerable number of years, we will be develop a model based on the Kaggle Bitcoin dataset. The goal for this project is to show how a trained model can predict the price of a cryptocurrency using Bitcoin as an example if we give the right amount of data and computational power using Long Short Term Memory (LSTM).

II. DATA SET

We intend to use Kaggle dataset for the Bitcoin prediction. The dataset is comprised of transactions from 01/12/2014 to 09/01/2019.

- It consists of high and low price for the time window of a minute along with bitcoin transacted in the same window.
- Dataset contains 250,000 transactions with an estimated value of $3Billion per day.

III. METHODOLOGY

After the recent popularity of bitcoins, many researchers have tried to implement prediction models. In this section, we have shown the methodology that has been used to predict the Bitcoin price. We are planning to gather data from Kaggle Bitcoin dataset and split it into training set and validation data set for performance evaluation

A. Data Cleansing

From the available data we consider only the relevant for the prediction. For all the data sets with NaN values are replaced and datasets are merged into one.

B. Data Normalization

Sometimes the data that is available can have large values and smaller values which has a wide range, Hence it is necessary to normalize the data. By using Min-Max scaling the data inputs are mapped on a number from 0 to 1.

C. Long Short Term Memory

We have single out Long Short Term Memory as the best reliable model. Since the Prediction of bitcoin price requires remembering the previous outcome. LSTM layer consists of gates including forget gate, input gate, output gate and cell state which helps us in remembering the previous outcome. The cells carry relevant information required for prediction over the time step. The cells states are updated by means of an input gate. As the process goes on the information is added and remembered by cell states. Remembering data which is stored long back is not going to add any significant value for prediction. So, it is not sensible to remember old data, therefore LSTM has Forget gate which determines what needs to be remembered and removes the old data. The output gate determines what information should be there in the next hidden state. The architecture of the model includes the LSTM layer at the beginning followed by the Drop out layer, Dense layer, Activation layer. The LSTM layer has gates and cells as mentioned above. The dense layer is nothing but a fully connected layer.

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