Project Abstract

Cryptocurrency and the Wisdom of the Crowds

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Cryptocurrency is by-and-large unregulated by any government institution, but, it is still one of the most volatile forms of currency in the world. This volatility may be attributed to the fact that cryptocurrency prices remain highly dependednt on public opinion and investor sentiment. An overall positive outlook towards a specific type of cryptocurrency, or the endorsement of certain types of public influencers (most notably, Elon Musk), may drive mass investments, thus bumping up the value of that form of currency.

In this project, we build on this motivation, and aim to empirically study whether there is a correlation between public sentiment and the changes in cryptocurrency prices, and if there is, then how strong and what type of correlation. The scope of this project will initially be limited to one form of cryptocurrency, that is, Bitcoin. Bitcoin began being used in 2009, and 12 years later, it remains one of the most popular and valuable forms of digital currency. The intuition here is that if we can build a pipeline to study the effects of public sentiment on one form of cryptocurrency, it can be easily expanded to include different types of digital currency- this remains an important future scope of the project. Public sentiment in this project is measured through three popular public interest measures:

1. **Twitter Sentiment**: Twitter is a social media platform that allows discussions and interactions in the forms of tweets. It is a highly popular means of micro-blogging, and a powerful indicator of public sentiment, even for bitcoin[1]. In this project we will analyze the sentiment of tweets regarding bitcoin for a specific period of time, and see if this sentiment is an indicator of the direction in which Bitcoin prices will change[2].

2. **Reddit Networks**: Reddit allows forum-like discussions, arranged by topics as "subreddits". Reddit is a popular forum for cryptocurrency and stock-related discussion, and boasts of millions of users. This project analyses the network of discussion centred around bitcoin, and analyses the number of discussions (popularity), along with possible sentiment of those discussions. We will first explore whether popularity itself is a good indicator of change in bitcoin price, and then try to explore sentiment, motivated by prior works [3].

3. **Google Trends**: Google is one of the most powerful search engines, and it's daily search volume for a particular term may be indicative of public interest in that topic. We study the daily and weekly-aggregated search numbers for the term "bitcoin", along with a constellation of other keywords related to the term. While google trends are only indicative of *some* interest, we believe it may be a powerful supportive influencer of bitcoin prices [4, 5].

Through this project, we will discover whether public interest, measured through Twitter Sentiment[6], Reddit Networks, and Google Search Volume, is able to predict the change in daily prices of Bitcoin, measured categorically as a High Negative Change, Moderate Negative Change, No Commendable Change, Moderate Positive Change, and High Positive Change.

References

[1] J. Abraham, "Cryptocurrency price prediction using tweetvolumes and sentiment analysis," 2018.

[2] S. Colianni and M. Signorotti, "Algorithmic trading of cryptocurrency based on twitter sentiment analysis," 2015.

[3] S. Wooley, A. Edmonds, A. Bagavathi, and S. Krishnan, "Extracting cryptocurrency price movements from the reddit network sentiment," in *2019 18th IEEE International Conference On Machine Learning And Applications (ICMLA)*. IEEE, 2019, pp. 500–505.

[4] L. Kristoufek, "Bitcoin meets google trends and wikipedia: Quantifying the relationship between phenomena of the internet era," *Scientific Reports*, vol. 3, no. 1, 2013.

[5] N. Smuts, "What drives cryptocurrency prices? an investigation of google trends and telegram sentiment," *SIGMETRICS Perform. Eval. Rev.*, vol. 46, no. 3, p. 131–134, Jan. 2019. [Online]. Available: https://doi.org/10.1145/3308897.3308955

[6] A. Urquhart and Wang, "Does twitter predict bitcoin?" 2019.