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Deciphering Crypto Twitter

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Thilanka Munasinghe¹, Aparna Gupta¹ and Oshani Seneviratne¹ – Rensselaer Polytechnic Institute¹

May 24, 2024

Outline

1 The rise of cryptocurrency

2 Methodology

3 Results

4 Takeaways

5 Acknowledgements

The rise of cryptocurrency

- Bitcoin was released in 2009.

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- Ethereum was released in 2015.



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- ICO craze of 2017.



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The rise of cryptocurrency

But all was not well..

The rise of cryptocurrency

2022, 2023 were rough years for crypto

[1] C. DeVon, "Crypto investors lost nearly \$4 billion to hackers in 2022," *CNBC*, Feb. 2023. [Online]. Available: <https://www.cnbc.com/2023/02/04/crypto-investors-lost-nearly-4-billion-dollars-to-hackers-in-2022.html>

[2] S. Witley, "Crypto hack lawsuits rise as theft victims try untested claims," *Bloomberg Law*, Jan. 2023. [Online]. Available: <https://news.bloomberglaw.com/privacy-and-data-security/crypto-hack-lawsuits-rise-as-theft-victims-try-untested-claims>

The rise of cryptocurrency

2022, 2023 were rough years for crypto



\$4 Billion *stolen* in 2022 [1]

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The rise of cryptocurrency

2022, 2023 were rough years for crypto

\$4 Billion *stolen* in 2022 [1]

20 lawsuits filed in 2023 [2]

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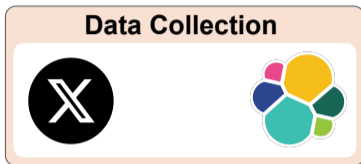
2 Methodology

3 Results

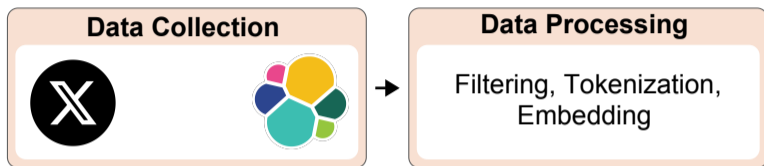
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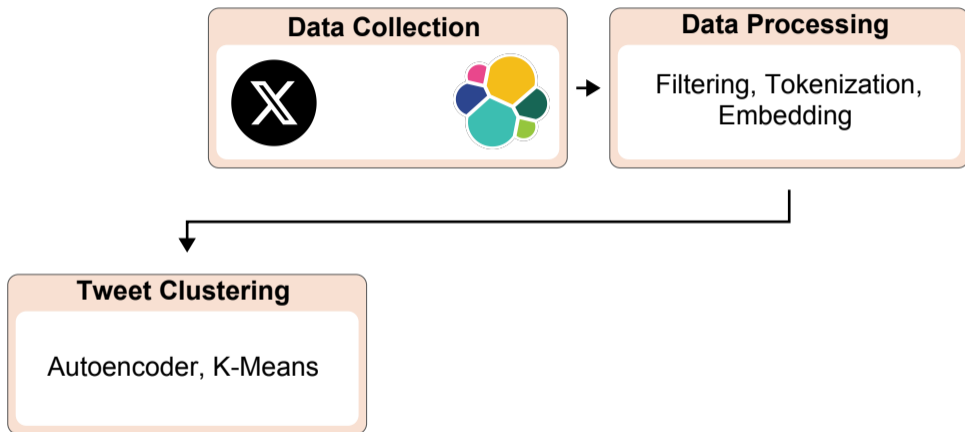
Methodology



Methodology



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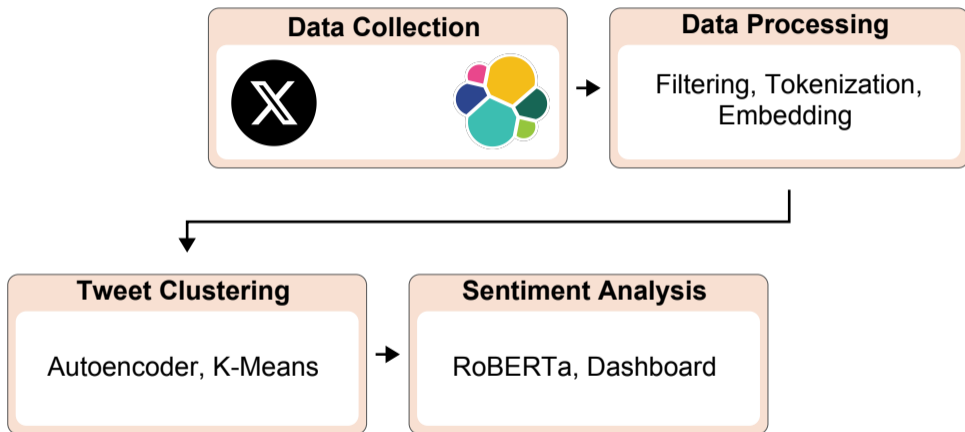


Cluster Identification

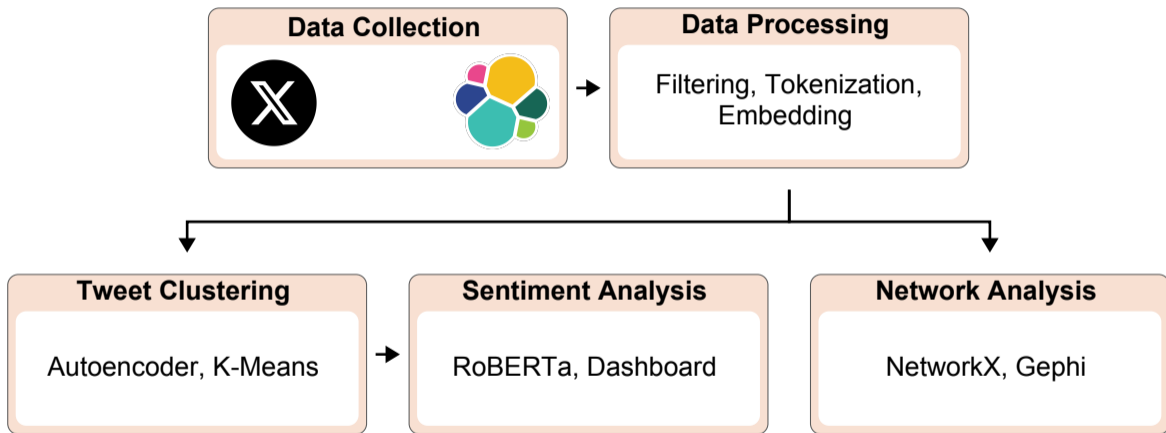
- BERT embeddings reduced to 10 dimensions using autoencoder.
 - Allows for batched training – does not require loading all data to memory at once.
- K-Means with elbow method – identified 6 clusters.
- Streamlit dashboard for visualization & exploration of clusters.



Methodology



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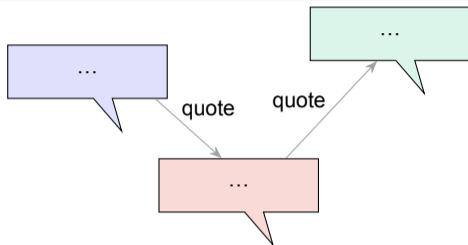


Network Construction

Graph Type	# Nodes	# Edges
Tweet-Quote	44,300	26,255
Tweet-Reply	1,591,247	1,034,017
User-Quote	1,640,251	2,520,608
User-Reply	2,340,960	7,298,105

- Nodes: User, Tweet
- Edges: Reply, Quote

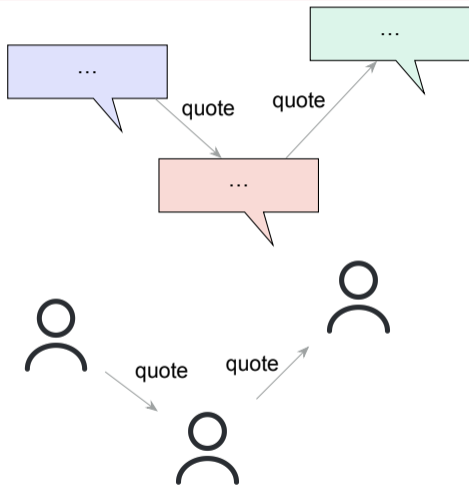
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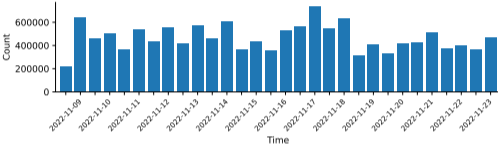
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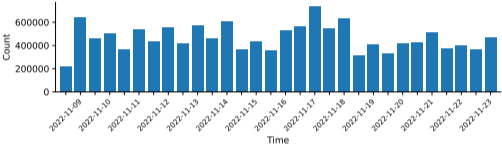
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Collected Data

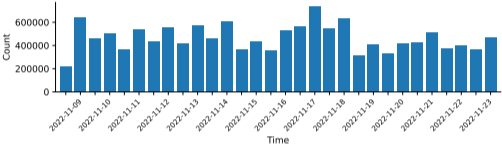


Collected Data



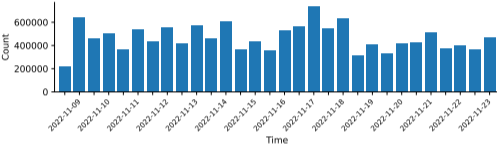
- Collection between Nov. 09, 2022
Nov. 23, 2022

Collected Data



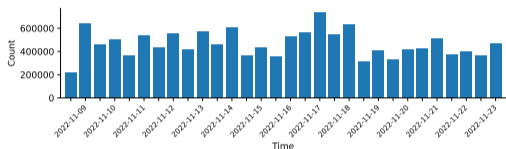
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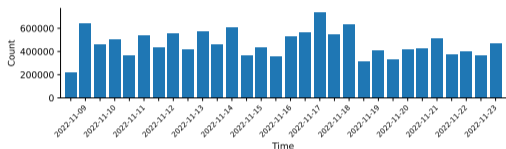
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Field	Description
id	Unique ID of tweet
timestamp_ms	Timestamp of tweet
user.id	User ID
full_text	Main text of tweet
quote_count	Number of quotes on tweet
reply_count	Number of replies on tweet
retweet_count	Number of retweets on tweet
favorite_count	Number of “favorites” on tweet
quoted_status.id	ID of tweet being quoted
quoted_status.user.id	User ID of tweet being quoted
in_reply_to_status_id	ID of tweet being replied to
in_reply_to_user_id	User ID of tweet being replied to

Cluster Characterization

ID	Characterization	Top 10 Keywords
	<i>Overall</i>	user, http, pump, just, signal, happen, crypto, wallstreetbets, event, kucoin
1	Crypto Conspirators	user, pump, http, signal, just, event, happen, wallstreetbets, kucoin, big
2	Meta Crypto Twitter	user, crypto, http, promote, roll, token, price, 000, binance, security
3	Crypto Observers	user, http, crypto, v2, rollup, address, tokens, claiming, compatible, evm
4	Crypto Commenters	roll, crypto, sushi, user, project, security, good, try, http, bridge
5	Crypto Doubters	user, http, pump, crypto, just, signal, kucoin, happen, event, wallstreetbets
6	Interested Investors	promote, user, crypto, price, roll, http, btc, binance, eth, bitcoin

Example Tweets

```
Tweet:
-----
@SignalsExp WallStreetBets Group, just announced a pump event! This Pump will
happen in just 4 hours on #Binance! https://t.co/9y8cW4ISRm....
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Sentiment Score: 0.4022
-----
Timestamp: 2022-11-21 00:45:19.967000
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Tweet:

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Tweet:

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Cluster 5:
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Tweet:
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Sentiment Score: -0.6951
Timestamp: 2022-11-11 02:27:05.050000

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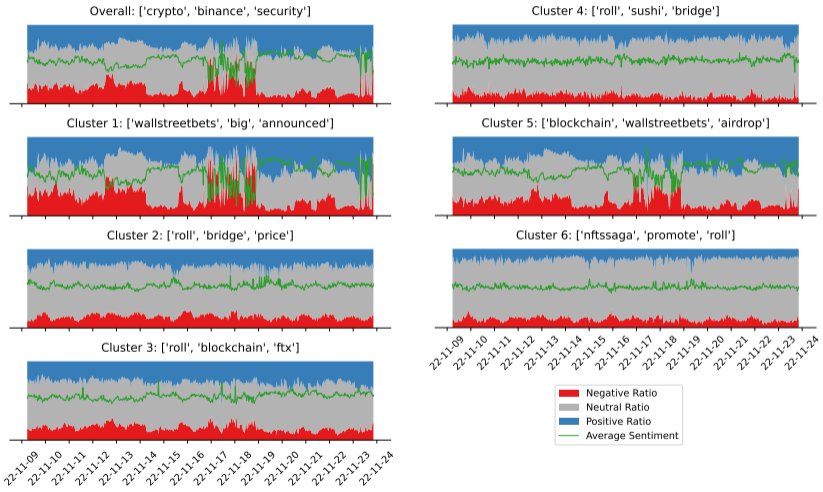
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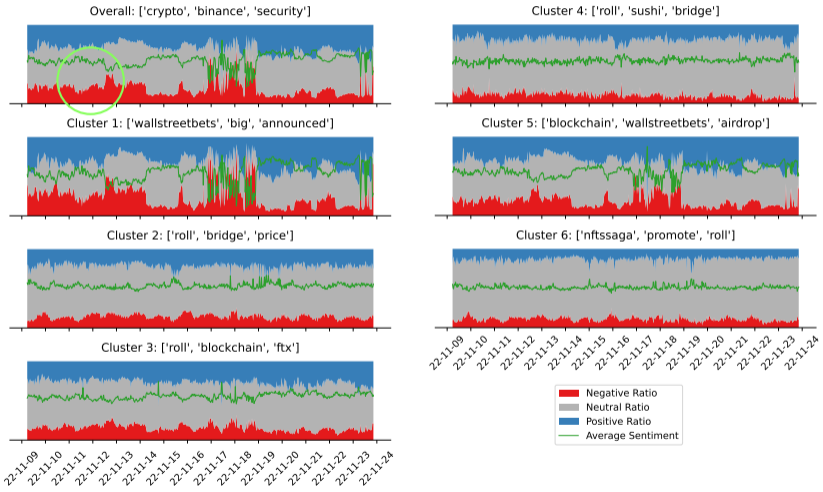
Cluster 6:
Rationalizing current market state

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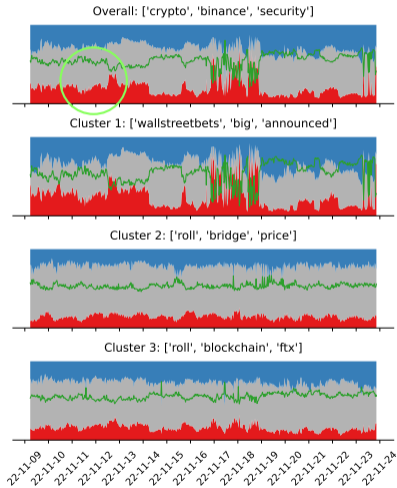
Cluster Sentiment Shift



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Cluster Sentiment Shift



Sam Bankman-Fried steps down as FTX CEO as his crypto exchange files for bankruptcy

PUBLISHED FRI, NOV 11 2022-9:21 AM EST UPDATED THU, MAR 28 2024-4:12 PM EDT



MacKenzie Sigalos
@KENZIESIGALOS

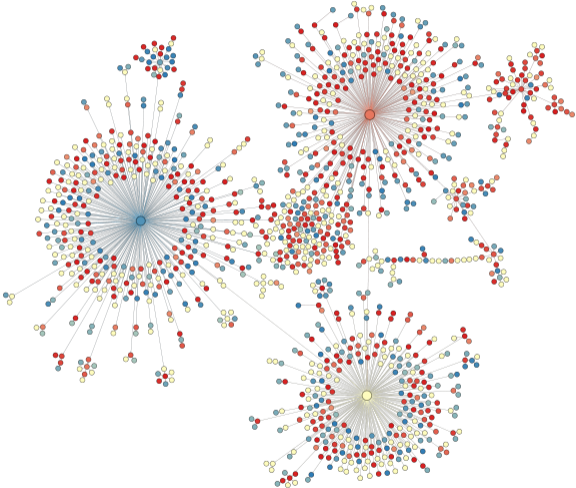
WATCH LIVE

KEY POINTS

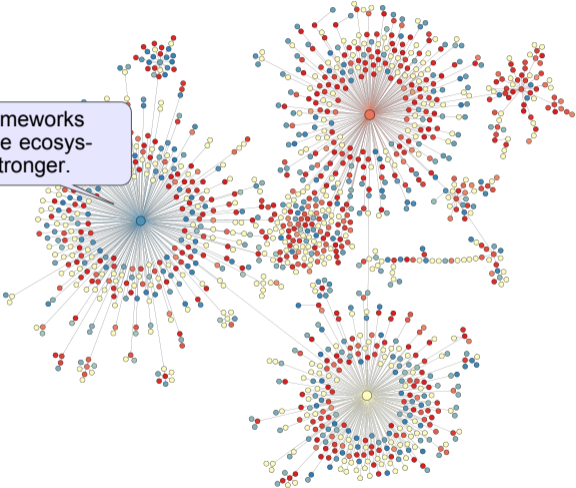
- Sam Bankman-Fried's cryptocurrency exchange FTX has filed for bankruptcy.
- Alameda Research and approximately 130 additional affiliated companies are part of the voluntary proceedings.



Tweet Network

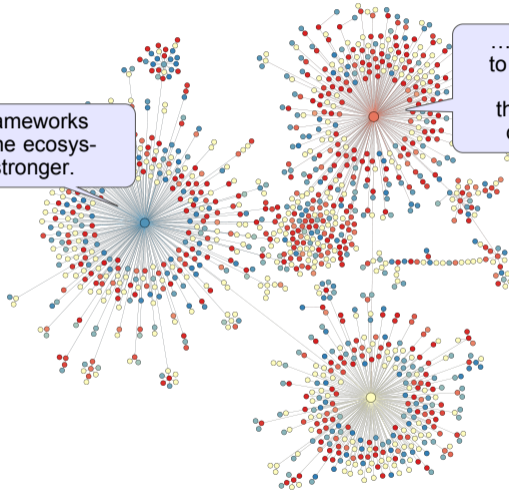


Tweet Network



As regulatory frameworks are developed, the ecosystem will grow stronger.

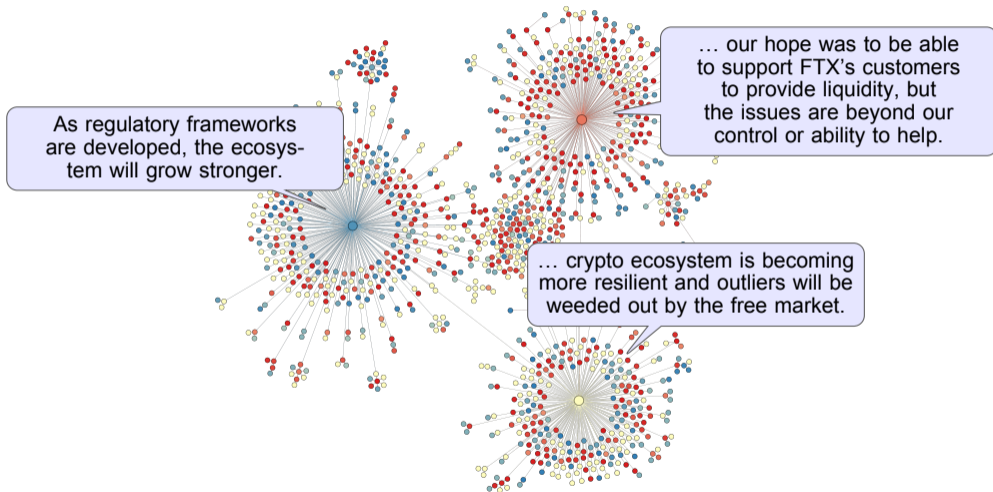
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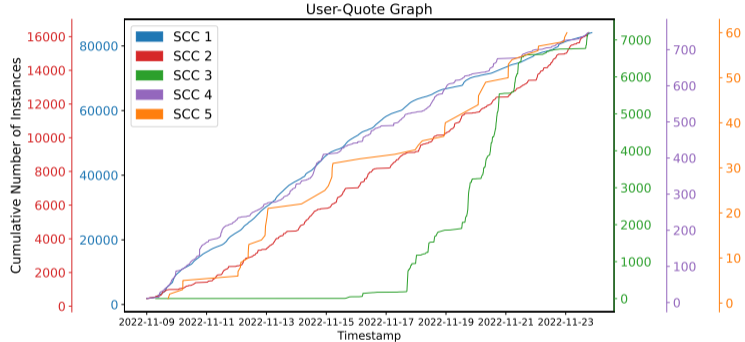
As regulatory frameworks are developed, the ecosystem will grow stronger.

... our hope was to be able to support FTX's customers to provide liquidity, but the issues are beyond our control or ability to help.

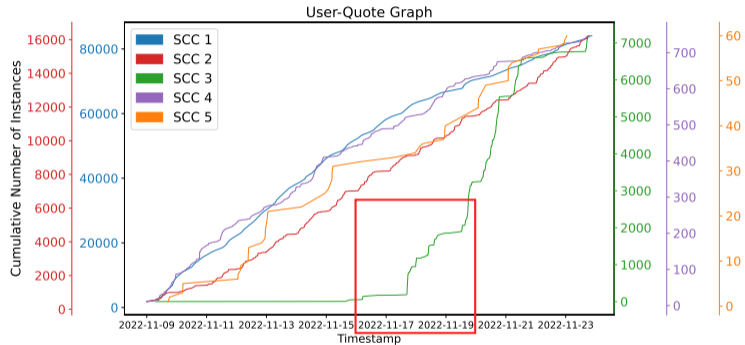
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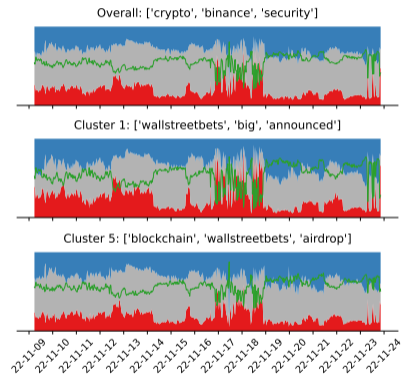
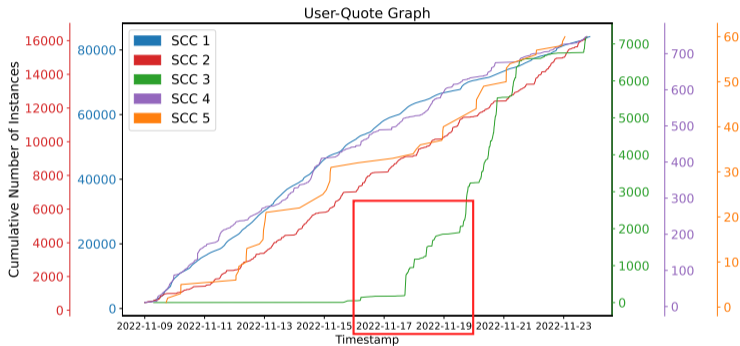
User Network



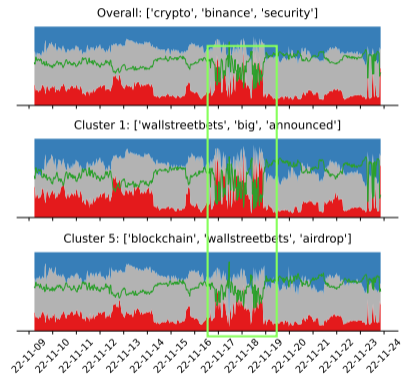
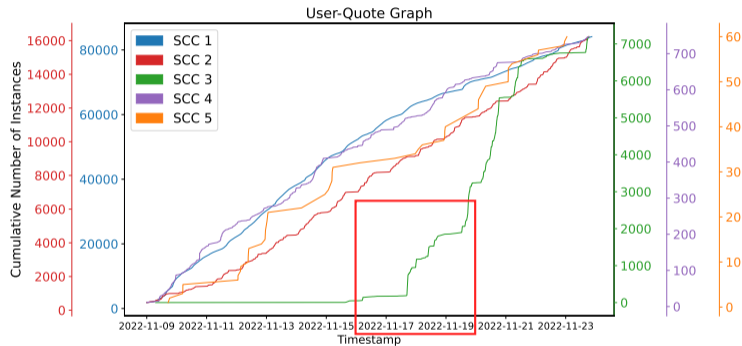
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4 **Takeaways**

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Takeaways

Good News

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- Sentiment polarity can be traced back to real-life events.

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- Sentiment polarity can be traced back to real-life events.
 - Can social media be used to *forecast* such events?

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 - Can social media be used to *forecast* such events?
- Communities of users with positive outlook still exist.

Takeaways

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- Large bot presence – many accounts that are now deleted.
- Identifiable ring of bot accounts pushing certain narratives.

Outline

1 The rise of cryptocurrency

2 Methodology

3 Results

4 Takeaways

5 Acknowledgements

Links

Paper



Github



Paper: <https://tinyurl.com/crypto-twitter>

Github: <https://tinyurl.com/crypto-twitter-code>



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