Set in Stone: Analysis of an Immutable Web3 Social Media Platform

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Research Goal

Understand the interplay between economic factors and social activities on **web3** social media

Reference: *Set in Stone: Analysis of an Immutable Web3 Social Media Platform*
W Zuo, A Raman, RJ Mondragón, G Tyson - Proceedings of the ACM Web Conference 2023, 2023

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Why is Web3?

Must pay for social action!!!!

➢ Centralized platforms run the risk of being shutdown or blocked

➢ Alternatively, web3 platform can offer **decentralized equivalents** of well-known centralized services

➢ Web 3 platform underpinned by blockchain technologies
  ○ No centralized data ownership
  ○ No centralized censorship

➢ Users must **pay** cryptocurrency for social activities (e.g., posting, following)

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Research Motivation

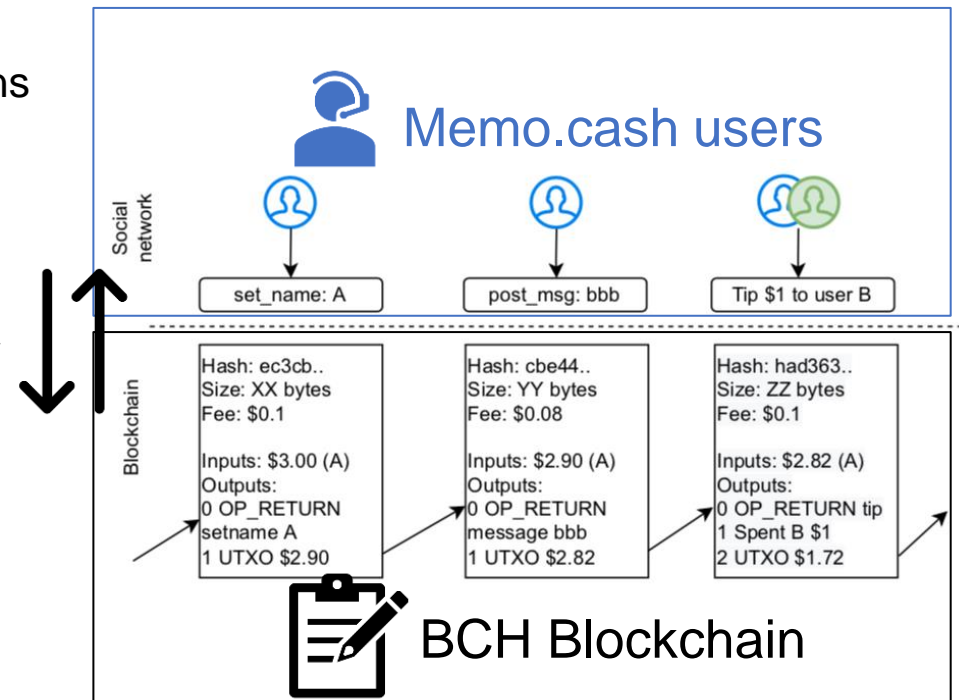**The risk of designing Web3 social platform**

➢ Decentralization comes at a ***cost***
  ○ Web3 shows a significant ***inequality*** among account wealth
  ○ User posts are shaped not only by social preferences but ***economic considerations***

➢ Another inherent feature is ***immutability***
  ○ Moderation system may fall short

➢ How ***centralized*** web3 really is

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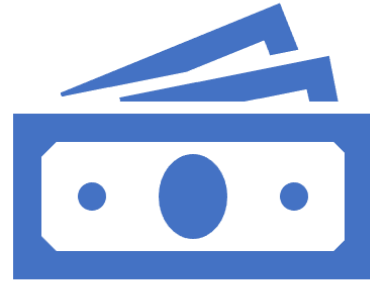*W Zuo, A Raman, RJ Mondragón, G Tyson - Proceedings of the ACM Web Conference 2023, 2023*

Research Objective: Memo.Cash

➢ Data Collection

    ○ A **crawler** developed to collect public data on memo.cash

        ■ extract all user identifiers listed

        ■ collect users' profile information

    ○ Dataset including user **meta information**, **posts information**, and **transaction information**

        • Data spans from Apr 2018 to Oct 2021

        • 24.02K users, 317.8K posts and 2.57M transactions

Permanent and uncensorable data

Memo.cash users

Social network

set_name: A   post_msg: bbb   Tip $1 to user B

Blockchain

Hash: ec3cb..
Size: XX bytes
Fee: $0.1

Inputs: $3.00 (A)
Outputs:
0 OP_RETURN
setname A
1 UTXO $2.90

Hash: cbe44..
Size: YY bytes
Fee: $0.08

Inputs: $2.90 (A)
Outputs:
0 OP_RETURN
message bbb
1 UTXO $2.82

Hash: had363..
Size: ZZ bytes
Fee: $0.1

Inputs: $2.82 (A)
Outputs:
0 OP_RETURN tip
1 Spent B $1
2 UTXO $1.72

BCH Blockchain

Users Economic and Post Topics

Users Are Equally Wealthy?
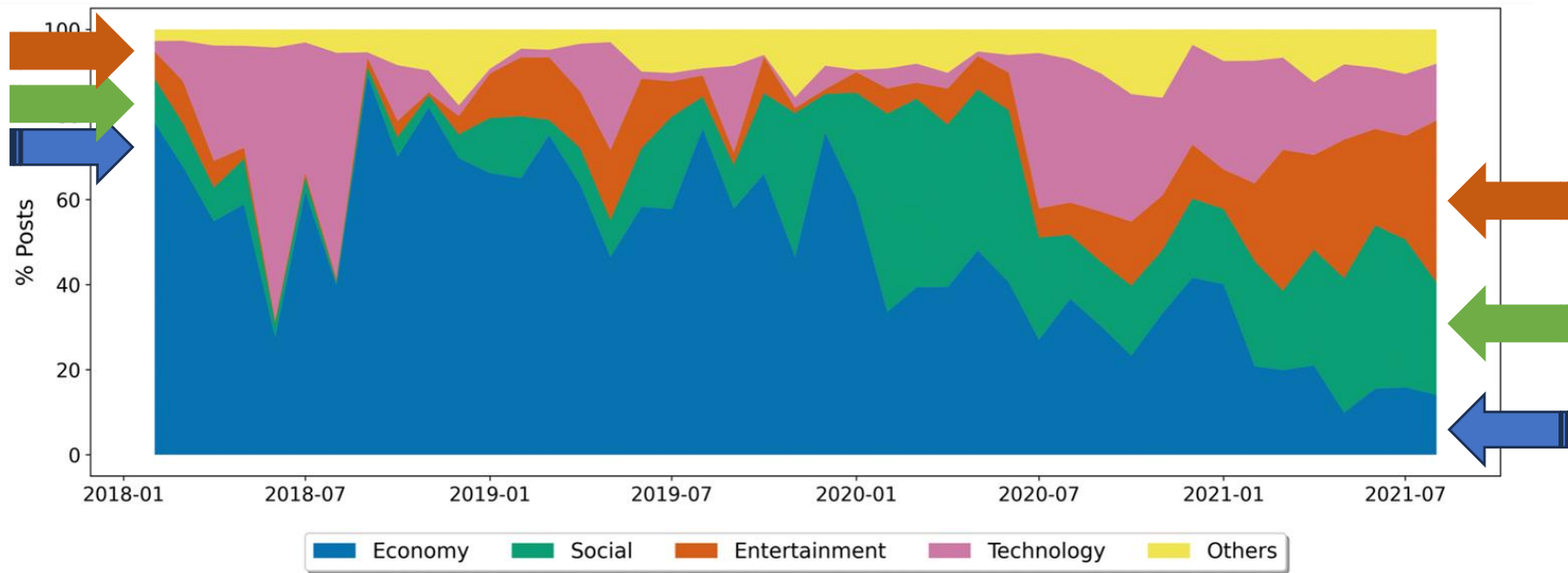

RICH CAT, POOR CAT

TOO MUCH SATOSHIS!

➤ A highly *skewed* wallet balance distribution
  ○ Top 1% of users owning 98.3% of asset
  ○ A *high Gini coefficient* of 0.99

This is particularly relevant, as memo.cash requires each social action to be paid for!

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Memo.cash is Blockchain Community?

○ Post can be tagged with a *topic*

○ From 2018 to 2021, something changes
  - Economy posts **decrease** from 77.3% to 16.8%
  - Social posts **increase** from 6.4% to 24%
  - Entertainment posts **increase** from 8% to 17.1%
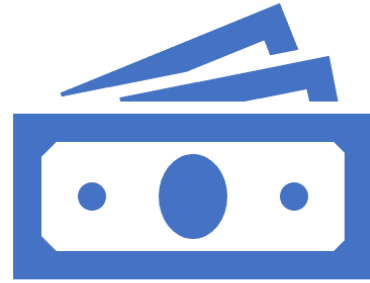
From a solely bitcoin to a wider forum!

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Does Users Economic Influence Following Topics?

Top 30 Topics
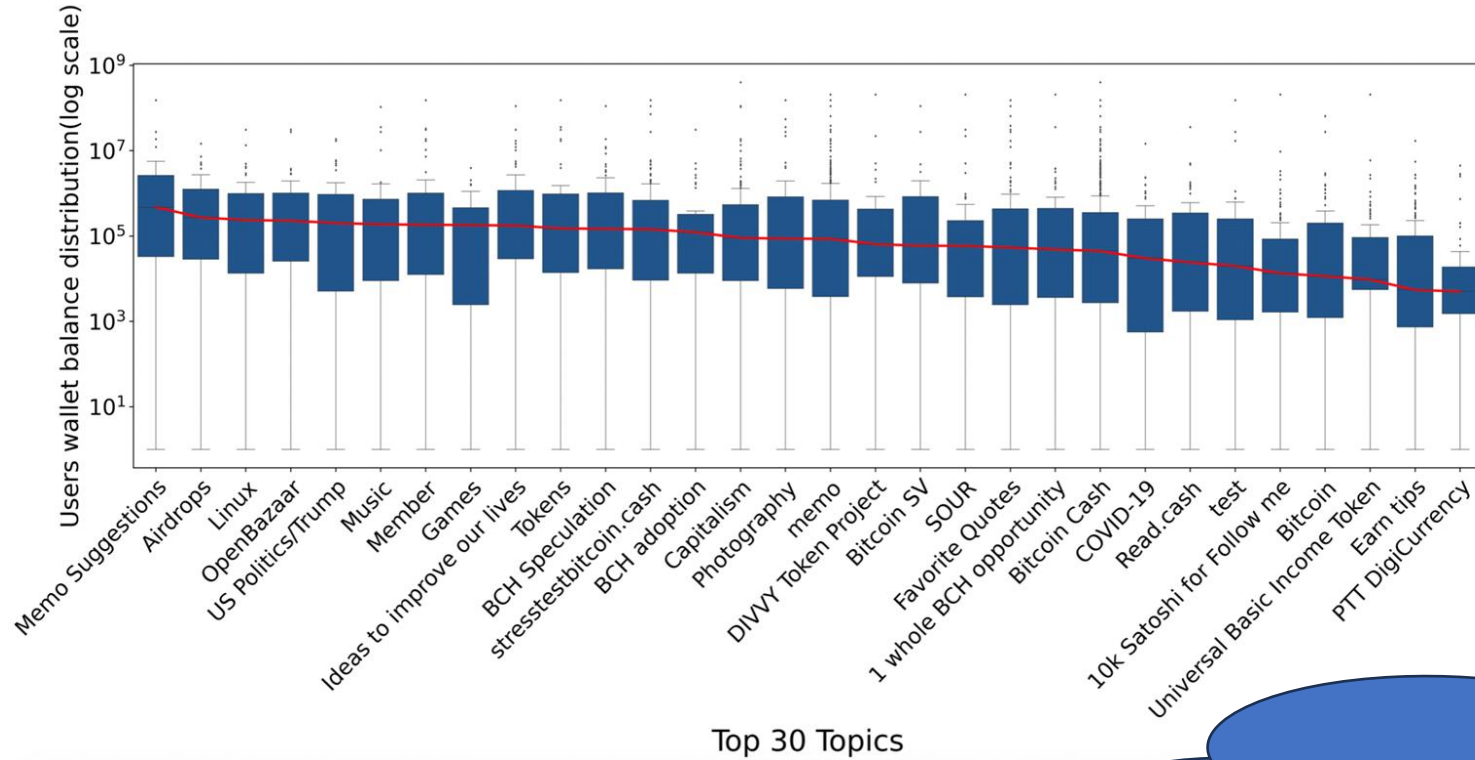
	20 Economic Topics	10 non-Economic Topics
Mean Wallet Balance (Satoshi)	5.4×10^6	1.5×10^6
Median Wallet Balance (Satoshi)	21,936	546

*Users more active in discussing **Bitcoin-related** topics, are similarly more active in **accumulating BCH wealth**!*

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Users Economic and Content Moderation

Is The User-controlled Moderation System Dominated by Wealthy Users?

➢ 7,987 unique domains making up for 92,853 URLs

   ○ VirusTotal API
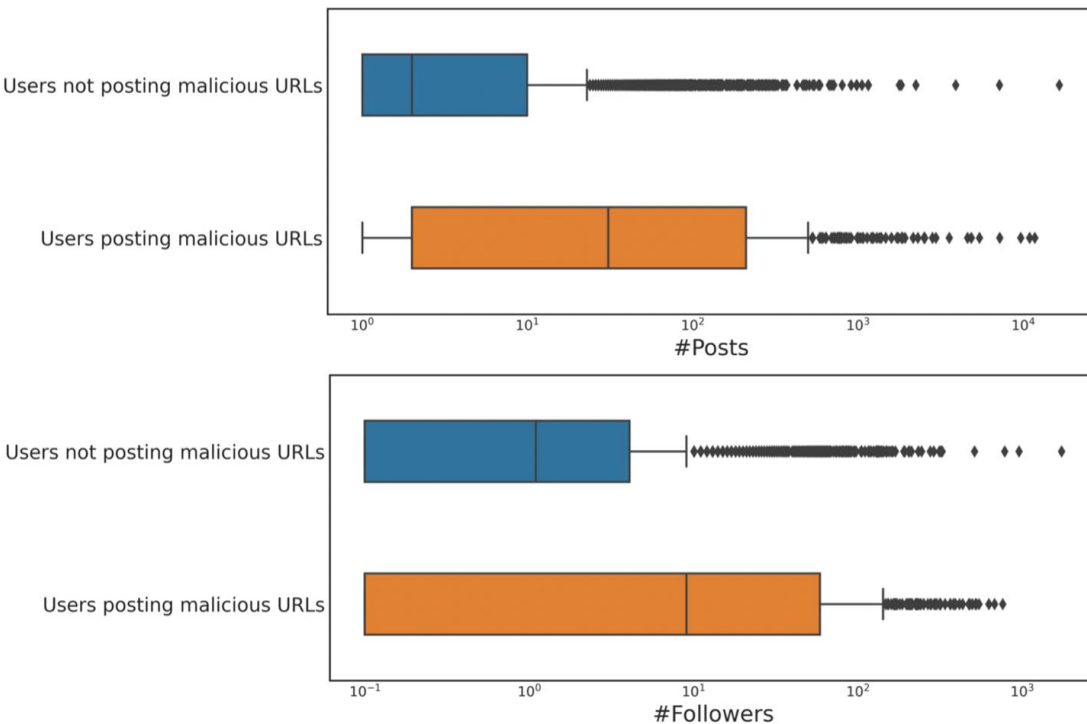
      ■ 6.5% malicious URLs
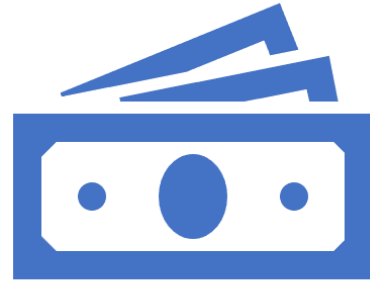
➢ ***Persistent and immutable*** Malicious URLs

   ○ Users who shared malicious URLs have ***greater social reach***

➢ ***User-controlled*** moderation system (mute)

   ○ ***Richer*** users moderate more

      ■ Spearman Coefficient of the number of mutes VS. wallet balance(0.37)

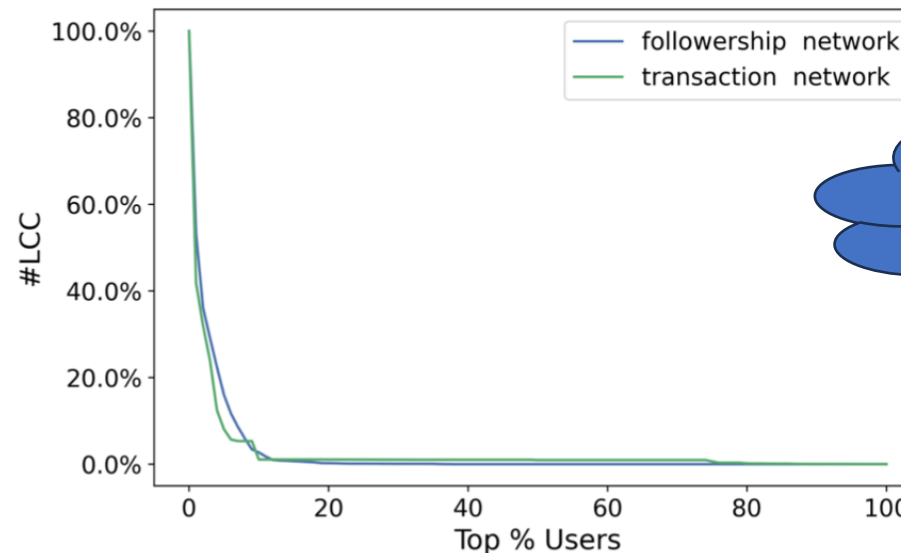**User-controlled moderation system may fall short!!**

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How Decentralized Web3 Really is?

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➢ The ***top 3%*** users are removed
  ○ 29.1% of the users remain in the Largest Connected Component (LCC) of the transaction graph
  ○ 23.9% of the users remain in the Largest Connected Component (LCC) of the social graph

➢ Both the social and transaction graph are ***highly vulnerable*** to the loss of users

A surprising degree of *centralization* on web3!

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Conclusion

➢ User posts are shaped not only by social preferences but ***economic considerations***

➢ User-controlled moderation system may ***fall short***

➢ Our findings indicate a surprising level of ***centralization*** on web3

➢ **Our research offers a new evidence base for researchers working in Web3, and flag key risks that must be considered!!**
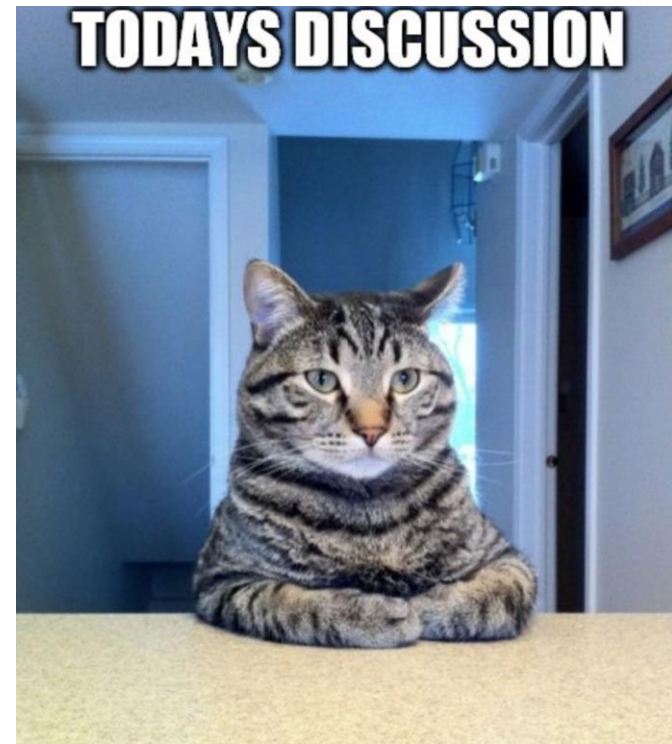
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WhatsApp

Thanks for Listening!