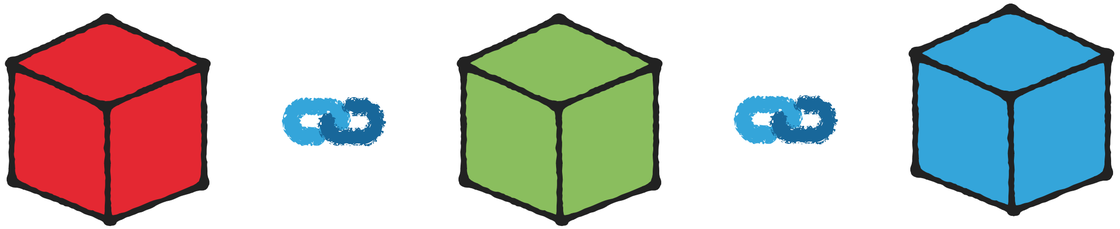

Fairness in Token Delegation: Mitigating Voting Power Concentration in DAOs

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MAX PLANCK INSTITUTE
FOR SOFTWARE SYSTEMS

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What Is a Decentralized Autonomous Organization (DAO)?

Decentralized Governance

- **Decision-making** authority is **distributed among members** instead of being concentrated in a central entity.
- **Benefits:** Increased inclusivity, resistance to centralized power abuse, and enhanced resilience.

Transparency

- Operations, decisions, and treasury **management are recorded on a blockchain, visible to all members** and stakeholders.
- **Benefits:** Builds trust and accountability within the community.

Smart Contract Automation

- **Rules and operations** of the DAO **are encoded in smart contracts**, enabling autonomous execution of tasks **without intermediaries**.
- **Benefits:** Efficiency, reliability, and reduced risk of human error.

Token-Based Membership and Voting

- **Members hold** tokens that represent **voting power** or rights within the DAO. Governance **often** operates **on principles like one-token-one-vote** or quadratic voting.
- **Benefits:** Aligns incentives, fosters active participation, and enables scalable governance.

Community-Driven Purpose

- DAOs are **typically mission-oriented**, focusing on goals such as funding projects, managing decentralized protocols, or creating shared value for members.
- **Benefits:** Engages a global, like-minded community united by a common vision.

What Are the Key Characteristics?

Token ownership

- It represents a **stake in the system**, allowing participation in decision-making.

Token delegation

- It enables holders to transfer **voting power to trusted representatives**, similar to liquid democracy.

Who can vote?

- Anyone with governance **(delegated) tokens can vote** on proposals via secure blockchain platforms.

On-chain vs off-chain voting

- On-chain voting ensures **transparency and immutability**.
- Off-chain voting is **faster** but less transparent.

Most typical voting systems

- Majority voting and quadratic voting.
- Locking tokens.
- Continuous voting.
- Fixed or dynamic quorum.

DAO LANDSCAPE

Curated by @Coo

DAO Operating Systems

- ARAGON
- MolochDAO
- COLONY
- Orca Protocol

Investment DAOs

- MetaCartel Ventures
- theLAO
- Flamingo
- GCR
- Komorebi
- Duck DAO
- UdacityFund

Collector DAOs

- PleasrDAO
- FlamingoDAO
- Gremlins
- FingerprintsDAO
- BRRDAO
- herstoryDAO
- MUSE0DAO
- Whale

Protocol DAOs

- MAKER
- Compound
- UNISWAP
- AAVE
- Yearn
- SYNTHETIX
- Index Coop
- PieDAO
- LIDO
- Sushi
- Curve
- pool together
- tornado
- KeeperDAO
- Badger
- hDAO
- RaribleDAO

Service DAOs

- RAID GUILD
- DXdao
- PartyDAO
- MetaFactory
- Fire Eyes
- Reverie
- NeptuneDAO
- LexDAO
- MetaverseDAO
- Llama

Social DAOs

- FWB
- Seed Club
- GITCOIN
- FiatLuxDAO
- Metafam
- KrausHaus
- Bright Moments
- SquiggleDAO
- ProsperDAO

Media DAOs

- BanklessDAO
- FOREFRONT
- GCR
- DarkstarDAO

Case Study: Compound and Uniswap

Characterize governance protocols

- They are **active and regularly used**, with a steady flow of proposals.
- The majority of the **proposals receive significant support**.

Analysis of token concentration

- A small group of **10 voters holds a significant voting power**.
- **Proposals** only **required** an avg. of **3—5 voters to obtain at least 50% of the votes**.

Analysis voting cost

- We reveal a **huge variation in voting costs**.
- **Voting costs can be unfairly expensive for small token holders**, which has fairness implications for the decision-making process.

Voting pattern of voters

- We discover **potential voting coalitions** among the top voters in Compound UNISWAP
- This could exacerbate concerns of **voting concentration**.

Compound

UNISWAP

Understanding Blockchain Governance: Analyzing Decentralized Voting to Amend DeFi Smart Contracts – arxiv.org/abs/2305.17655

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Compound

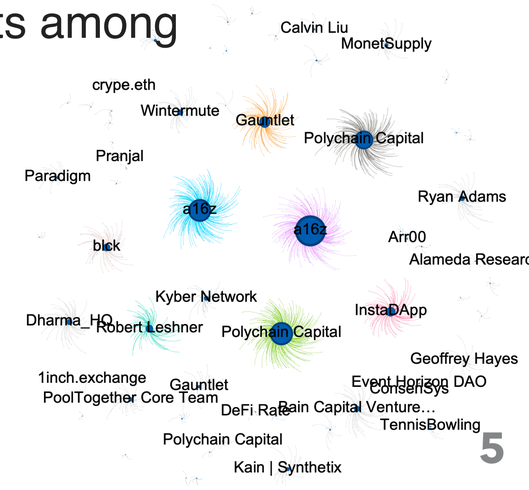
UNISWAP

- It leads to real-world consequences.
  - Smaller voices are drowned out.
  - Participation might decrease.
  - Open doors for vulnerabilities.

Understanding Blockchain Governance: Analyzing Decentralized Voting to Amend DeFi Smart Contracts – arxiv.org/abs/2305.17655

How Does Delegation Typically Work Today?

- **DAO vs. Traditional Elections:** Unlike traditional systems (nationality-based voting power), DAOs require active delegation of voting power (to self or others).
- **Key Question:** **Amongst all participants, who should token holders choose as their delegate?**
- **Platform Influence:** Dashboards displaying DAO information (delegated tokens, voting records) can inadvertently bias choices towards highly-ranked participants.
- **Consequence:** Potential "*rich get richer*" dynamic, concentrating power and undermining decentralization.
- **User Challenge:** Difficult for token holders to identify delegates truly aligned with their interests among numerous options.



Tally: a Platform Designed To Support DAOs

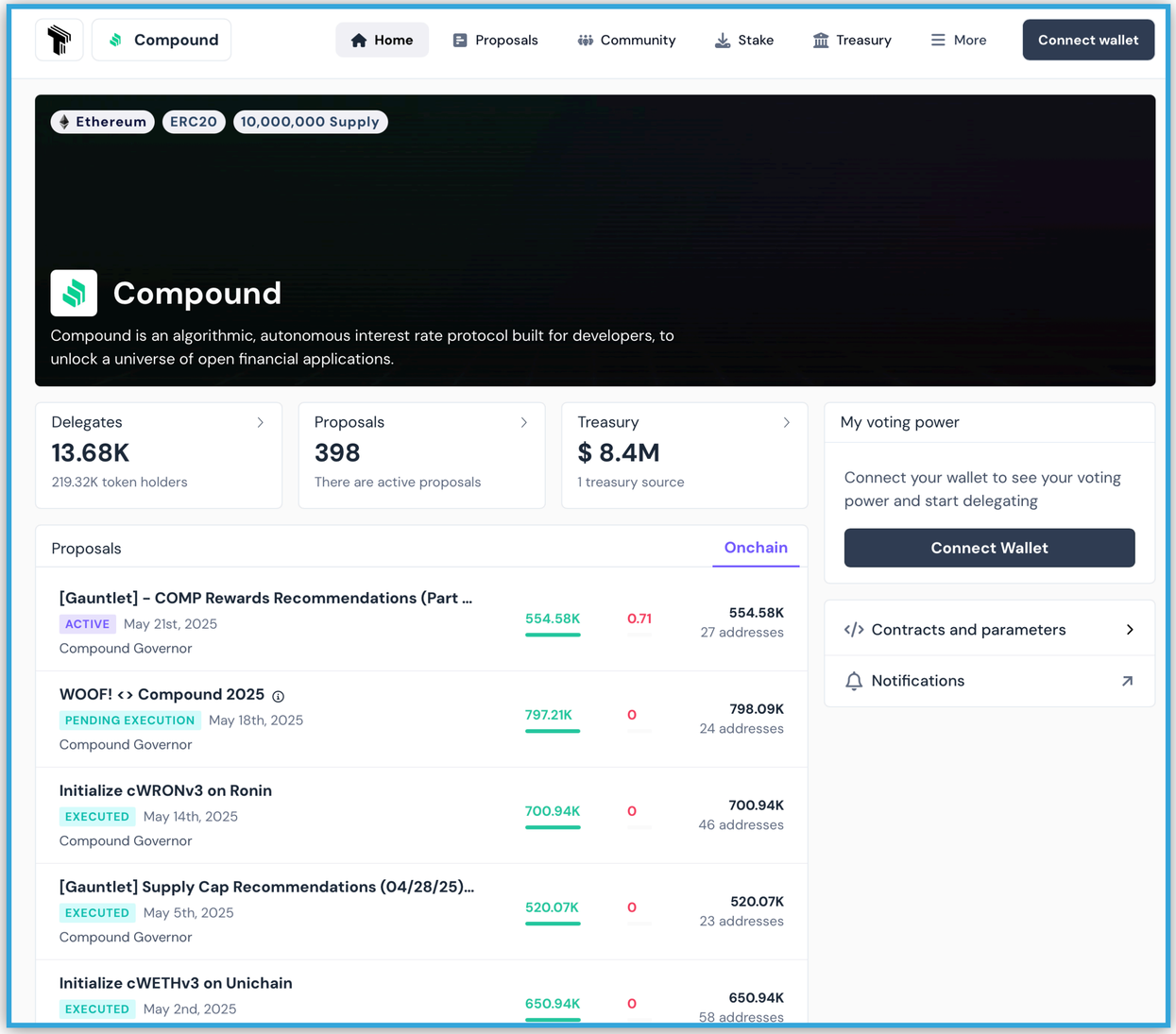
Key Features of Tally 🍀

- **Token Launch:** It provides tools for deploying tokens, ensuring scalable distribution and seamless integration with EVM chains.

- **Governance Management:** It enables on-chain proposal creation, voting, and execution. It supports frameworks like OpenZeppelin Governor and offers features such as delegate registration and transparent voting power management.

- **Staking Solutions:** Its staking system allows protocols to distribute fees to token stakers, aligning economic incentives between protocol usage and token holder rewards. It supports features like liquid staking tokens (LSTs) and integrates with restaking protocols.

- **Tally Protocol:** It introduces a liquidity layer for governance tokens, enabling token holders to earn staking rewards while maintaining voting rights.



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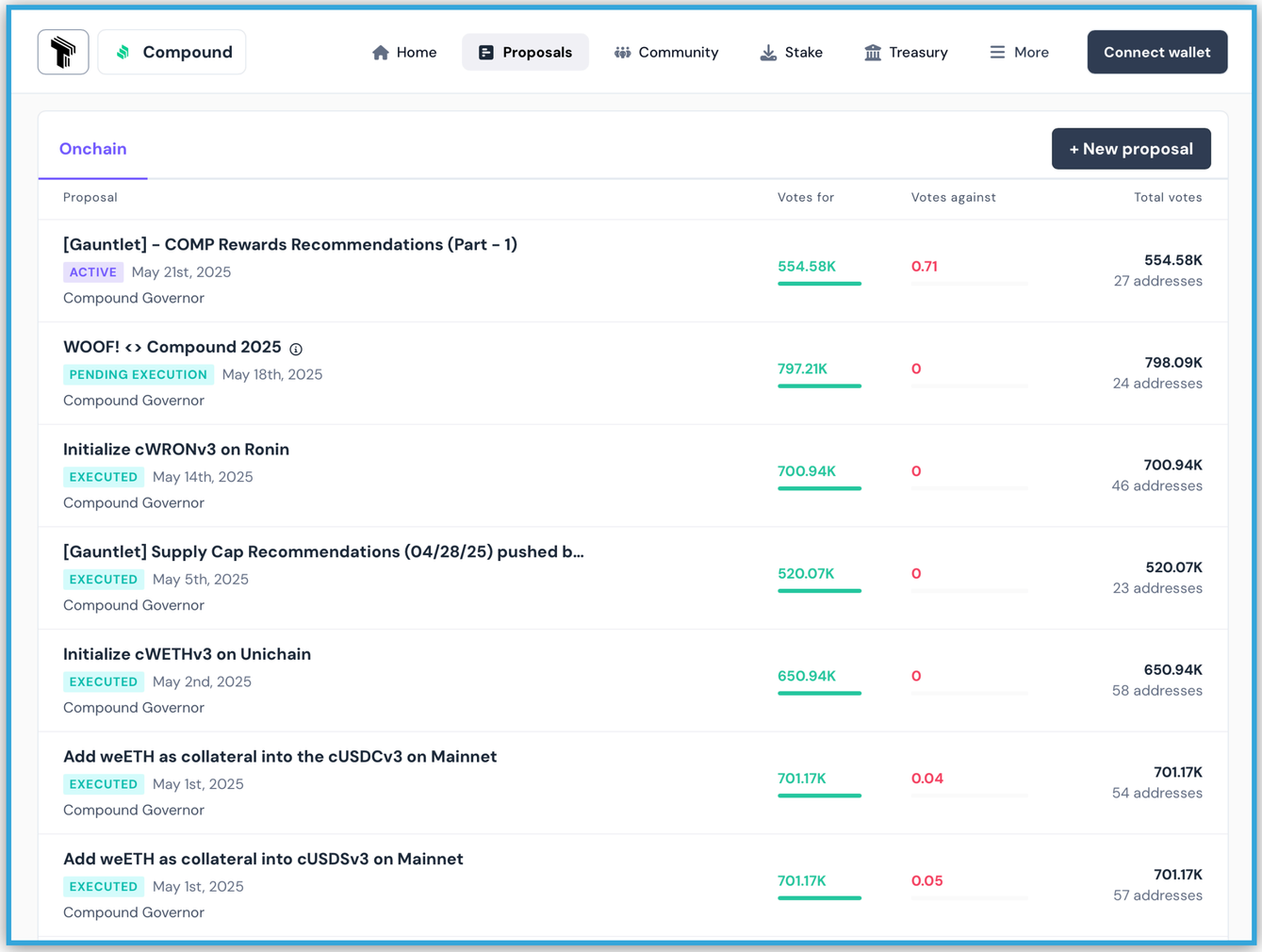

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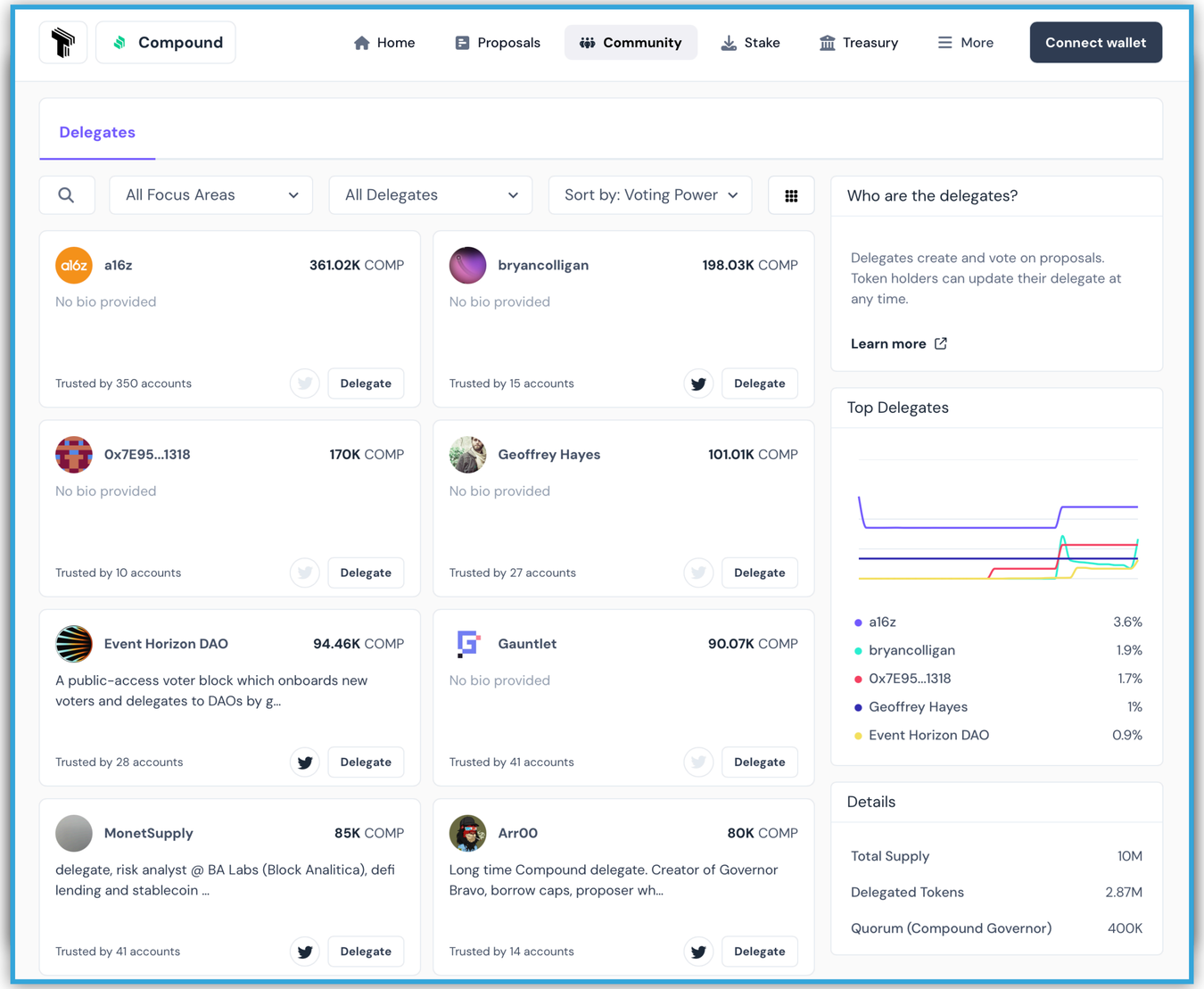

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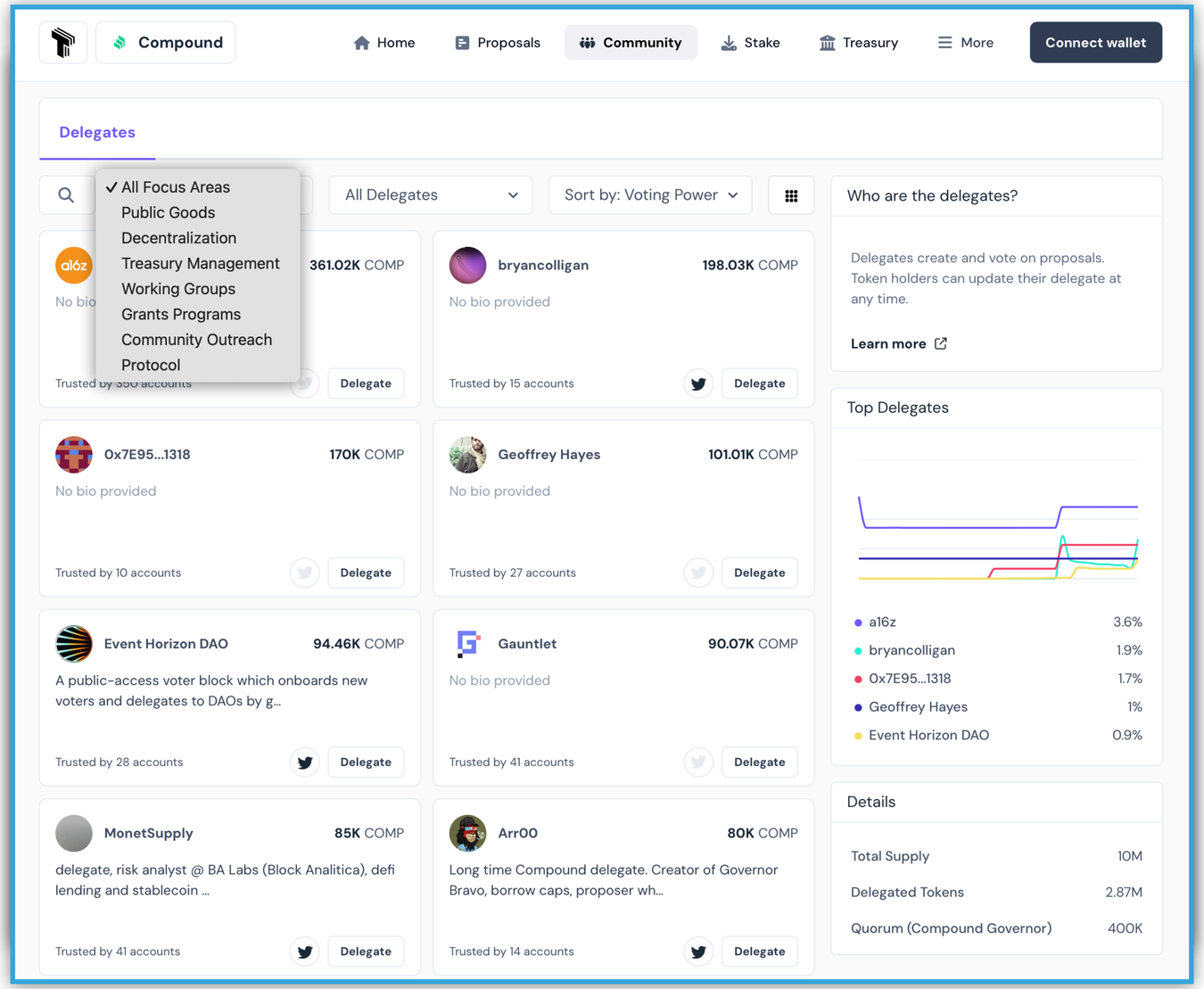

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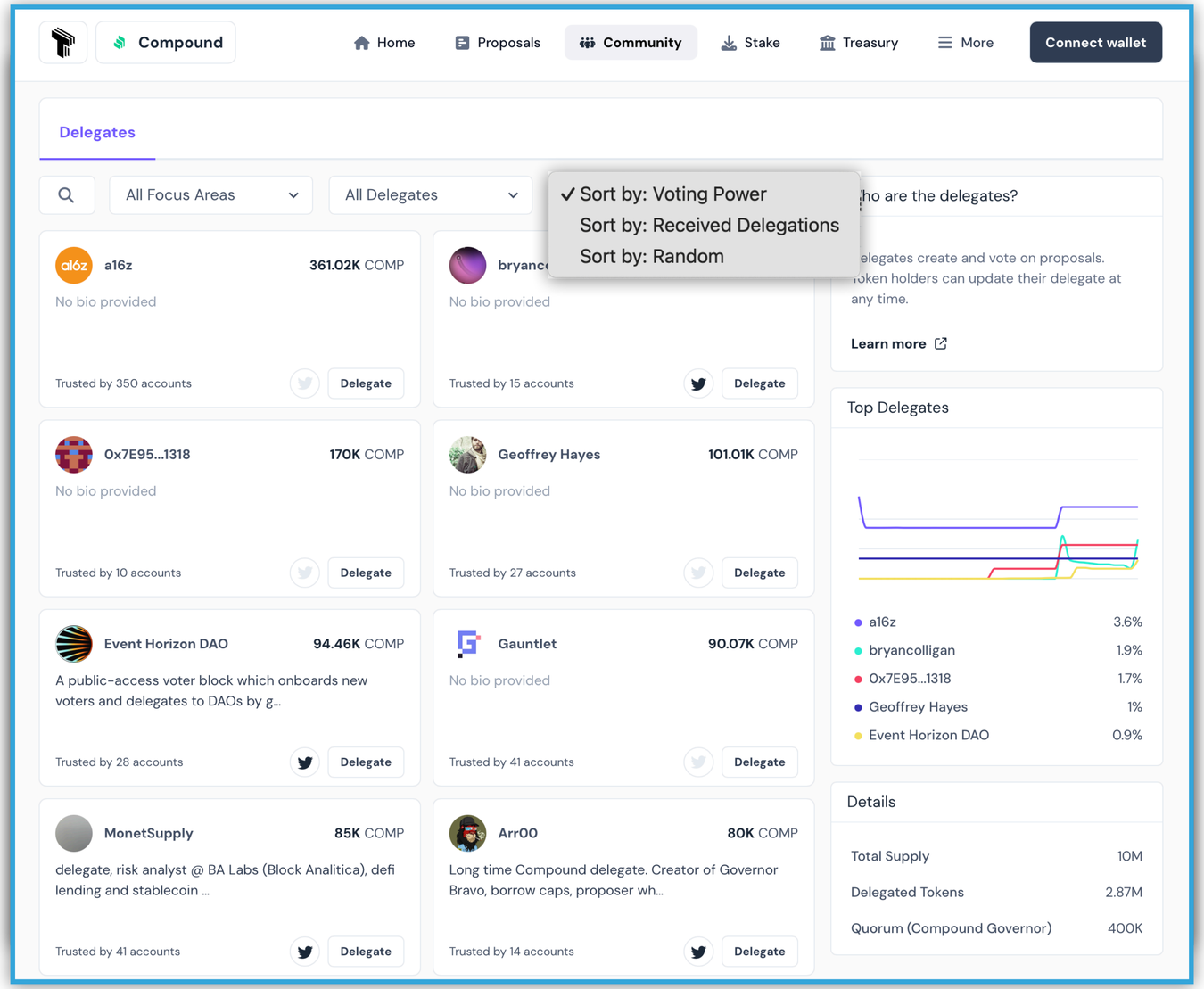

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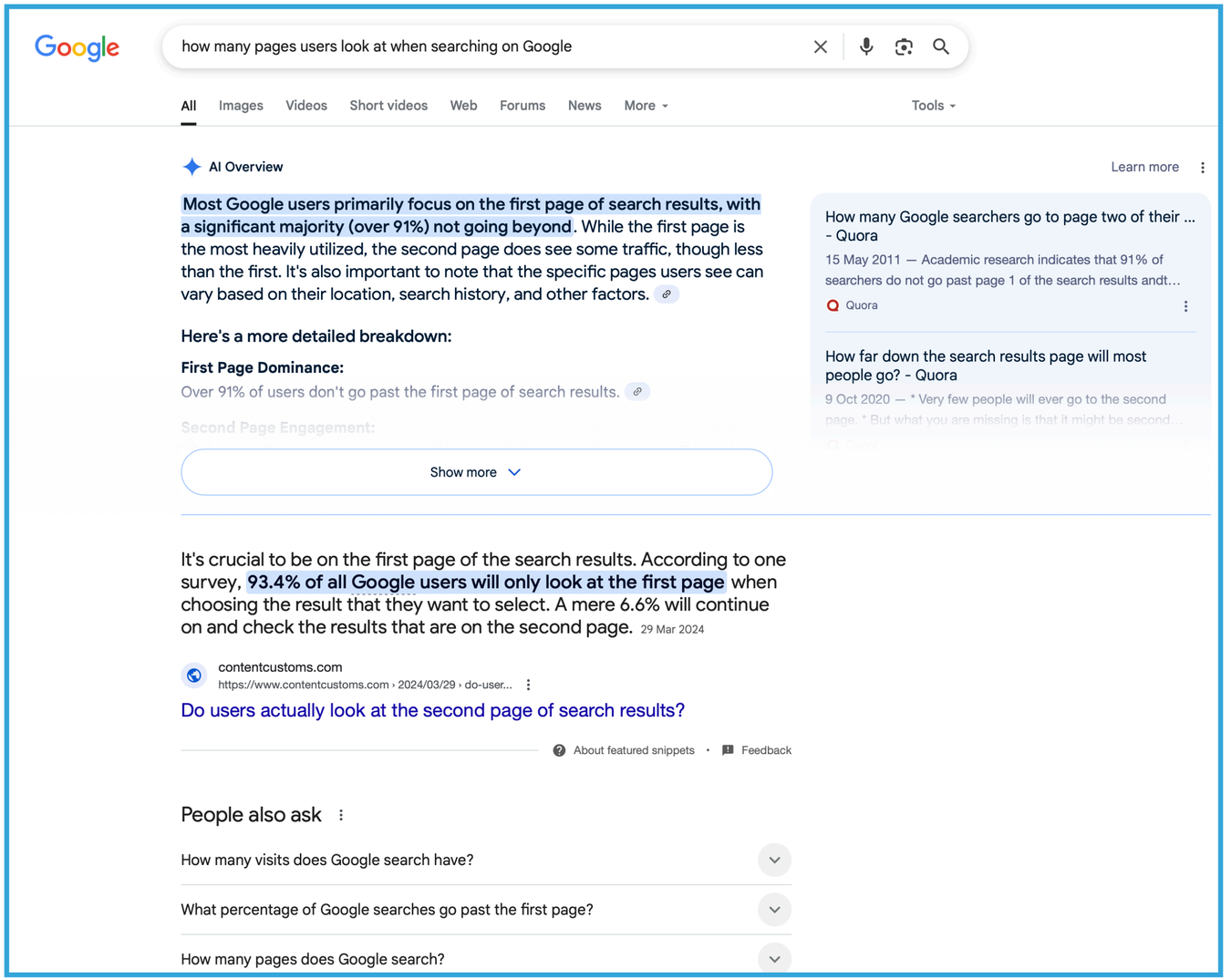
Ranking Order Can Influence User Choices



Marketing Research Survey: Google Search Behaviors — https://www.teknicks.com/blog/marketing-research-survey-google-search-behaviors

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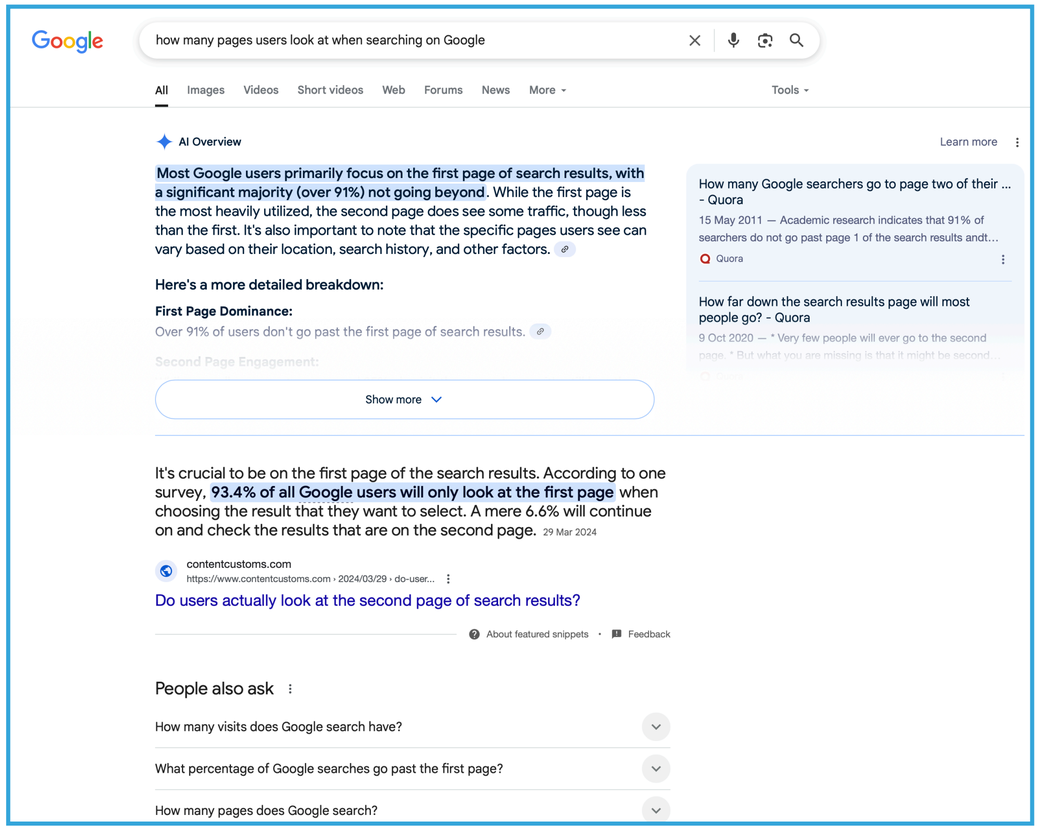

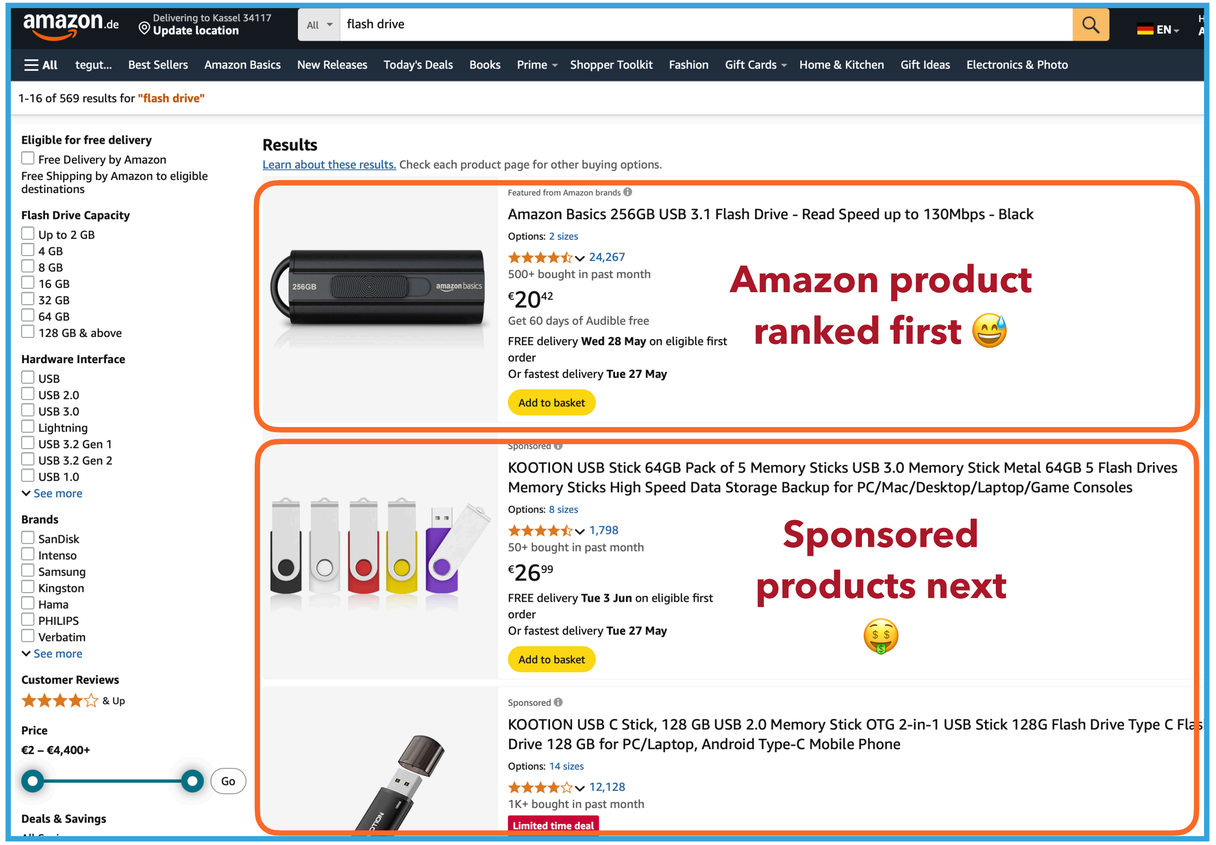

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FaiRIR: Mitigating Exposure Bias from Related Item Recommendations in Two-Sided Platforms – arxiv.org/abs/2204.00241

What Can We Do About It? 🤔

A Proactive Solution: Interest-Aligned Delegation Matching

- **Address a critical challenge in DAO governance:** Optimizing delegation matching!
- **Like in traditional democracy:** voters vote for a politician when they have their interested aligned.

Why not do the same with token delegation in DAOs?

- **Goal:** Provide governance systems with tools to:
  Users delegate to voters who are better aligned with their interests.

  Reduce delegation bias.

  Improve transparency of voting power distribution.
- **Example:** A "*Delegation Advisory*" system, similar to voting advisories in democratic elections.

- **Enhanced Decision-Making:** Lead to more secure, decentralized, and effective DAO governance.

Roadmap

Data Acquisition

- On-chain data (Ethereum & other archive nodes).
- Text-based data: Off-chain discussions (Forums, Discord).
- Other relevant data platforms (e.g., Nansen, Messari, Tally).

Voting Behavior Analysis

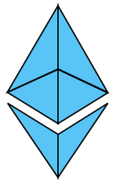
- Analyze how voters engage on proposal discussions.
- Extract topics of interested for each voter.
- Publish results in an academic paper.

Implement Delegation Matching Algorithm

- Design and build a MVP of delegation matching system.
- Implement a simulation environment framework to test the system.

Test and Evaluate

- Deploy the matching algorithm by partnering with delegation platforms / DAO projects.
- Evaluate the performance via A/B testing and/or simulations.



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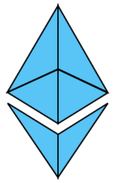

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How can we improve DAOs?

- **Fairness is Fundamental**
  - Fair token delegation is not a luxury but a necessity for the legitimacy and long-term success of DAOs and DeFi.
- **Problem**
  - Delegation matching is a critical, unsolved challenge in DAO governance, impacting decentralization and fairness.
- **Proposed Solution**
  - An interest-aligned delegation matching mechanism.
    - Address voting power concentration and participation barriers.
    - Enhanced transparency, reduced bias, stronger security, and more effective, truly decentralized DAO governance.
    - To promote genuine fairness, increase decentralization, and build more robust and representative DAO ecosystems.
- **Key Questions**
  - How many delegates are actually available?
  - Are their opinions diverse?
  - How wealthy are the delegates?

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