

Democracy .Earth



A 501 (c) 3 non-profit founded in 2015 building open source censorship resistant digital democracy.



Background.

Democratic innovations for parliaments, NGOs, parties & networks.

A brief history of democratic innovations.

During this decade we sought to implement new democratic decision making mechanisms in real contexts. Democracies are not surveys but rather more often than not the path of last resort chosen by communities facing a *deep conflict*.



1 Digital Political Party.

Date: April 2012.
Location: Buenos Aires, Argentina 🇦🇷
Reach: 4000 signatures.
Entity: Political Party

We founded a party with the proposition of having candidates committed to vote in congress according to people's will online. Partido de la Red (PDR) is considered the first ever digital political party in the American continent.



2 Campaign & First Election.

Date: October 2013.
Location: Buenos Aires, Argentina 🇦🇷
Reach: 21,962 votes (1.2% of electorate).
Entity: Political Party

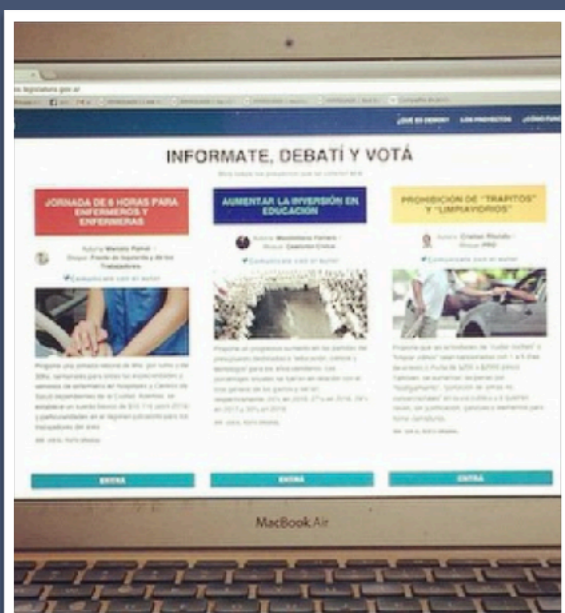
The party ran for its first election for Congress with a \$15,000 budget. Reached 1.2% as an independent party and helped kickstart a movement of digital parties in the region. Today is part of the governing coalition.

1 2012

2 2013

3 2014

4 2015



3 First Congressional Pilot.

Date: November 2014.
Location: Congress of Buenos Aires 🇦🇷
Reach: 30,000 voters.
Entity: City Congress.

All 16 parties in Congress agreed to present a bill each and let citizenship vote online to decide which one should be treated. We focused on using open source tech but the Workers Party won by flooding the system with fake users.



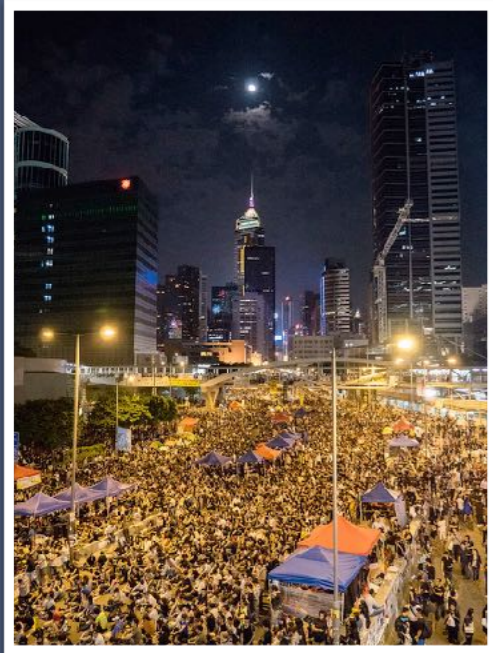
4 Y Combinator.

Date: January 2015
Location: Mountain View, CA 🇺🇸
Funding: \$100,000
Entity: Non-profit Organization.

We created the Democracy Earth Foundation for the research and development of digital democracies using censorship resistant networks. We focused on blockchain protocols and engaged legislatures globally.

We piloted every democratic scheme for every kind of organization.

In the last 5 years we deployed liquid democracies (dPoS), participatory budgeting (PB), direct democracy (DD), quadratic voting (QV); and worked for parties, legislatures, non-profits and decentralized networks.



4 Shadow Referendums.

Date: October & December 2016.
Location: Colombia & Hong Kong 🇪🇸 🇭🇰
Reach: 12,000 & 800,000 voters each.
Entity: Non Profit Organizations & Political Movement.

Colombian expats liquid voted each aspect of the peace agreement in parallel to the official referendum. In Hong Kong we secured votes using the Bitcoin blockchain for a shadow election for city major with the Umbrella Movement.



5 High Stakes Direct Vote.

Date: March 2017.
Location: Buenos Aires, Argentina 🇲🇪
Reach: 1,200 affiliates.
Entity: Political Party

To decide whether the party would make alliances with other forces or not in the 2017 election, a highly disputed vote was held that led to noticing the relevance of decentralizing voter right consensus. The party eventually ran under the government coalition that got 50%.

4 2016

5 2017

6 2018

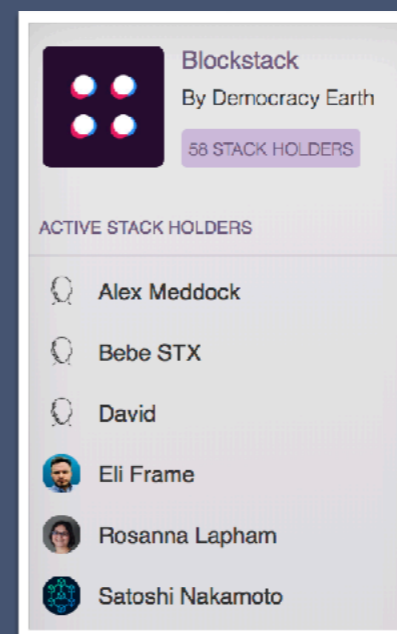
7 2019



6 First Congressional Vote.

Date: June 2018.
Location: Congress of Argentina 🇲🇪
Reach: 14,850 voters.
Entity: National Congress.

Congressman Garreton opened up his vote with our software to decide on a highly controversial bill to legislate abortion in Argentina. He chose to vote according to his province's voters criteria rather than follow the global result.



7 Crypto Budgeting.

Date: September 2018 - April 2019.
Location: New York, NY 🇺🇸
Budget: \$400,000
Entity: Decentralized Network.

We piloted Blockstack's App Mining program allowing investors decide over a monthly subsidy of \$100,000 to be paid in BTC for developers building with this protocol. We detected collusion and other known Participatory Budgeting issues.

Governance & DAOs

Distributed Autonomous Organizations

Proof of Work (PoW) ignores society.

Nakamoto governance is centered around machines, not people.

The proof-of-work also solves the problem of determining representation in majority decision making. If the majority were based on one-IP-address-one-vote, it could be subverted by anyone able to allocate many IPs. **Proof-of-work is essentially one-CPU-one-vote.** The majority decision is represented by the longest chain, which has the greatest proof-of-work effort invested in it. If a majority of CPU power is controlled by honest nodes, the honest chain will grow the fastest and outpace any competing chains. To modify a past block, an attacker would have to redo the proof-of-work of the block and all blocks after it and then catch up with and surpass the work of the honest nodes. We will show later that the probability of a slower attacker catching up diminishes exponentially as subsequent blocks are added.

To compensate for increasing hardware speed and varying interest in running nodes over time, the proof-of-work difficulty is determined by a moving average targeting an average number of blocks per hour. If they're generated too fast, the difficulty increases.

Bitcoin's white paper paragraph on governance (2008). Guaranteeing a right to privacy bent early blockchain design toward anonymity. While that approach helps fight financial corruption, political manipulation still exploits the internet in ways that can also be fought back with decentralized computation.

Proof of Stake (PoS) is plutocratic.

Skin in the game staking breaks when there's conflict of interests.



As an example, during the Aragon Network Vote held in April 2019, a single *whale* stakeholder allocated his tokens at the last minute to tumble the entire election in favor of his interest. Any coin-voting scheme renders the actual voting process irrelevant. Also: investors face conflict of interest and their vote is not necessarily aligned with a DAO.

MolochDAO — Minimal Viable DAO

```
function ragequit(uint256 sharesToBurn) public onlyMember {
    uint256 initialTotalShares = totalShares;

    Member storage member = members[msg.sender];

    require(member.shares >= sharesToBurn, "Moloch::ragequit - insufficient shares");

    require(canRagequit(member.highestIndexYesVote), "Moloch::ragequit - cant ragequit u

    // burn shares
    member.shares = member.shares.sub(sharesToBurn);
    totalShares = totalShares.sub(sharesToBurn);

    // instruct guildBank to transfer fair share of tokens to the ragequitter
    req

);
emi
}
```

The screenshot shows the MolochDAO website interface. At the top, there is a navigation bar with a 'New Proposal' button. Below the navigation bar, there are several status indicators: 'Voting Period (1)', 'Grace Period (0)', 'Ready For Processing (0)', 'In Queue (0)', and 'Completed'. The main content area displays three proposal cards. Each card shows the proposal title, a link to the proposal details, the number of shares requested, the amount of tribute requested, and the current status (Failed or Passed). Below each card, there is a progress bar and a summary of votes.

Proposal Title	Shares Requested	Tribute Requested	Status	Yes Votes	No Votes
Membership Proposal: Ryan Zurrer	150	150.00	Failed	296	350
MGP 23: \$24,540 for Ethereum Tx GUI	161	0.00	Failed	224	316
Ethereum Cat Herders Note Taking Proposal	17	0.00	Passed	373	0

Forking MolochDAO

Initially the parameters will be based in 100 votes per member regardless of tribute and all HumanityDAO valid addresses can apply.

Voting using proxy Moloch Shares.

In a similar way to contracts like SelloutDAO, shares of existing members of Moloch can be used under these new democratic schemes and increase participation and community involvement with Ethereum 2.0

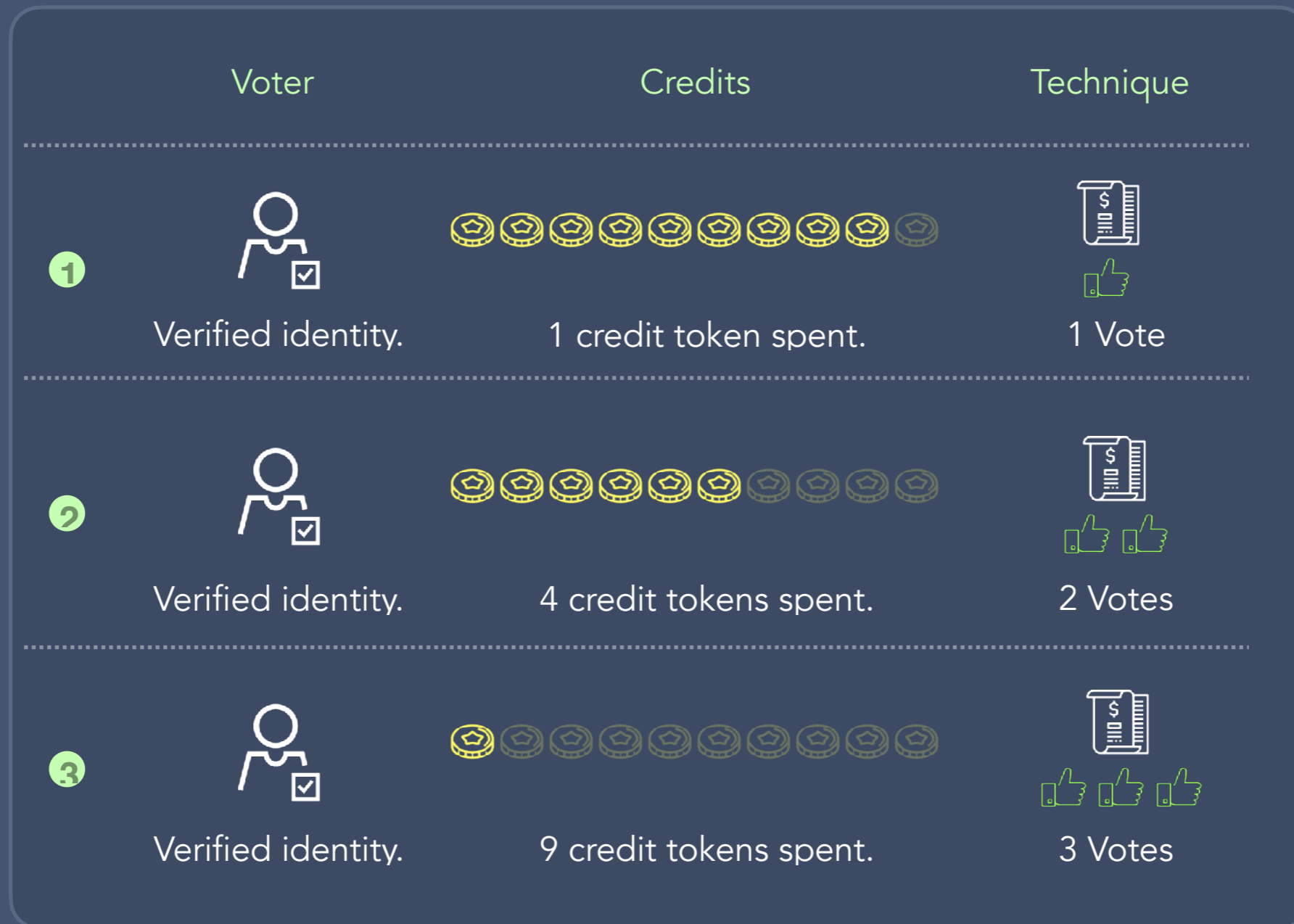
Other considerations moving forward.

- Minting ERC725 Identity tokens.
- Zero Knowledge voting & identity scheme.

Quadratic Voting

How Digital Technology can Transform Democracy

An ID scoring mechanism needs **legitimacy**.



Quadratic Voting (QV) can effectively rank a long tail of preferences.



Strengths of Quadratic Voting.

Today's "first-past-the-post" voting principle tends to produce a small number of major parties (often only two) and encourages tactical voting. QV is able to capture more information from voters enabling a better signal to capture legitimacy.

Zealotry becomes expensive.

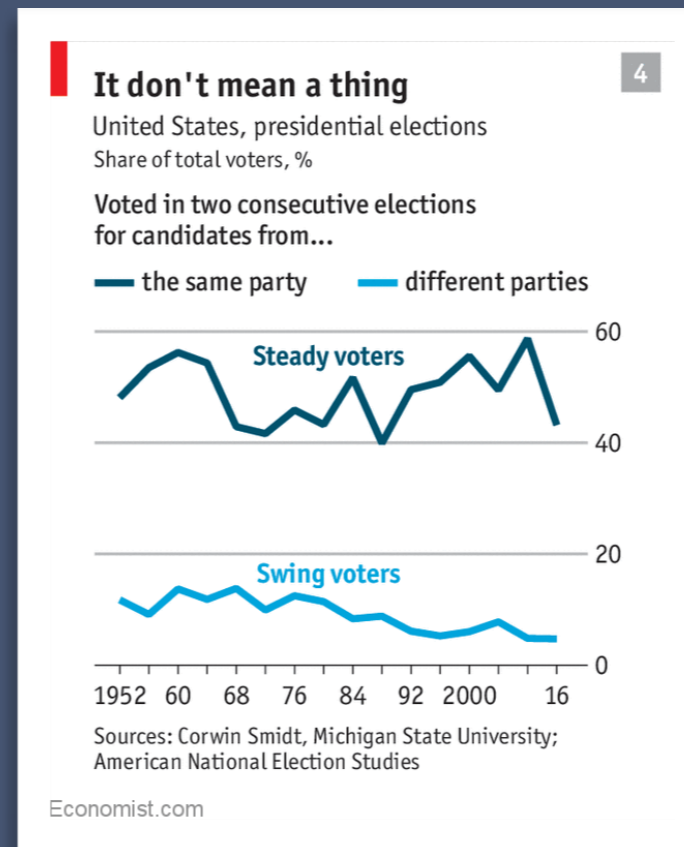
QV allows to find a common ground and prevent the polarization that risks the dividing a constituency. Voters are allowed to yell as loud as they want, but yelling comes with a cost.

A more nuanced way to vote.

The 'one man one vote' rule gives everyone minimum share in public decision making, but it also sets a maximum: it does not permit the citizens to register the widely different intensities with which they hold their respective political convictions and opinions.

Mitigates tyranny of the majority.

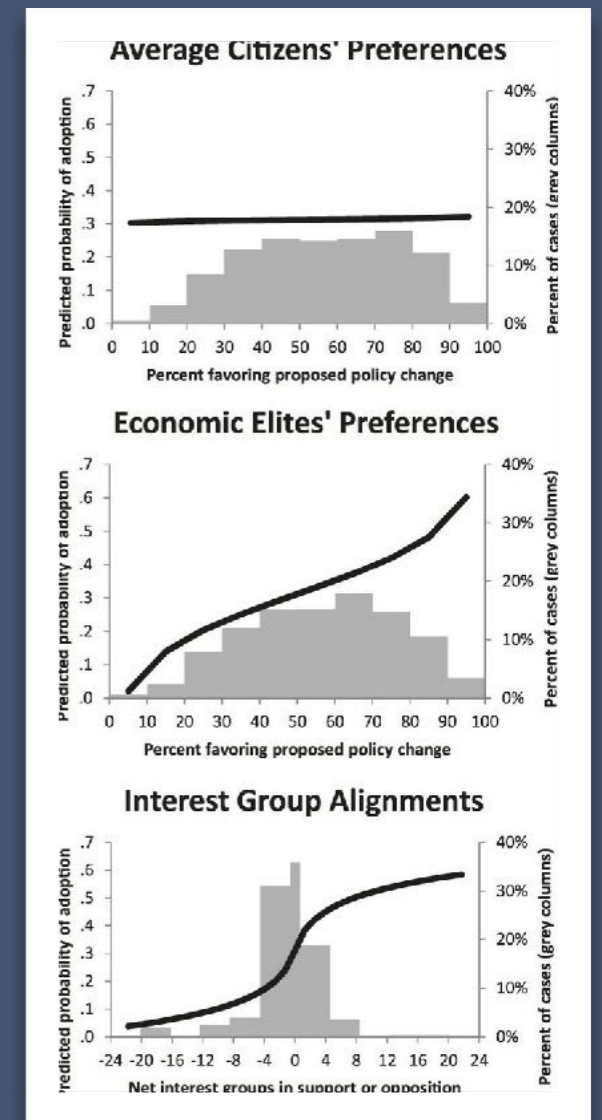
QV addresses the problem of the tyranny of the majority, a standard criticism of democracy. Assuming everybody cares the same amount cannot capture the plight of minorities and issues that dramatically affects certain groups of people. With QV you can vote harder on what's closer to home.



Percentage of swing voters in American Elections since 1952, Economist (2016)

Most elections today are decided by a ~20% minority that has weaker preferences and often changes their vote from election to election (swing voters).

Richer information from the winning and losing side gets captured with QV and it ultimately answers **whether the intense preferences of the minority outweigh the weak preferences of the majority.**

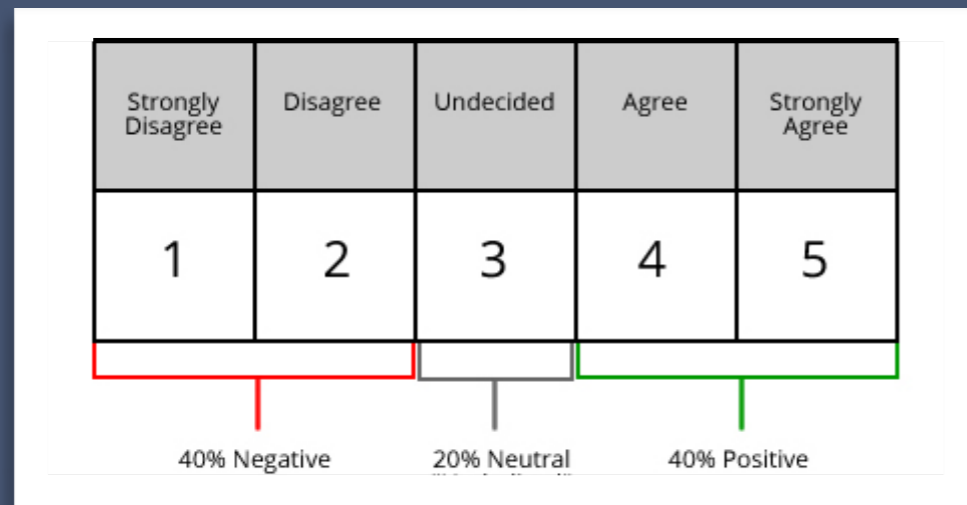


"Testing Theories of American Politics: Elites, Interest Groups, and Average Citizens", Gilens, Page, Cambridge University (2014).

The role that lobbying and interest groups play in congress can be addressed by the dynamics of quadratic voting.

Quadratic Voting generates organic data.

Comparing votes with Likert-Scale ballots not only reduced polarization but also led to a more organic distribution of preferences.

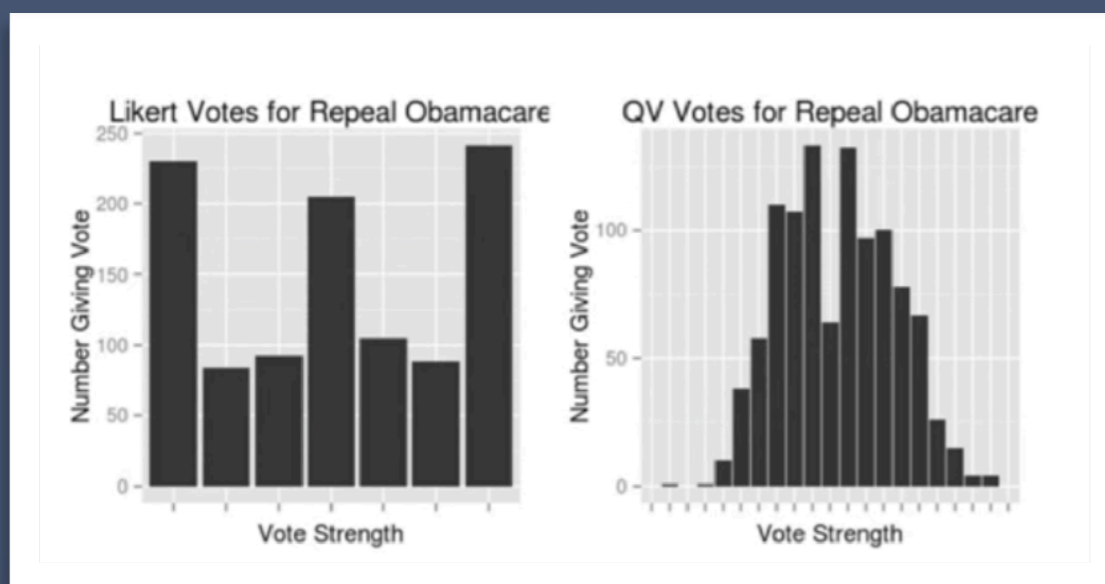
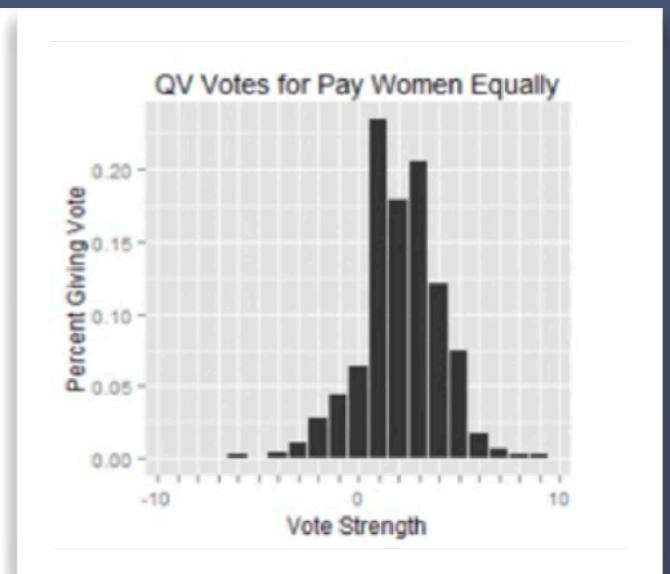
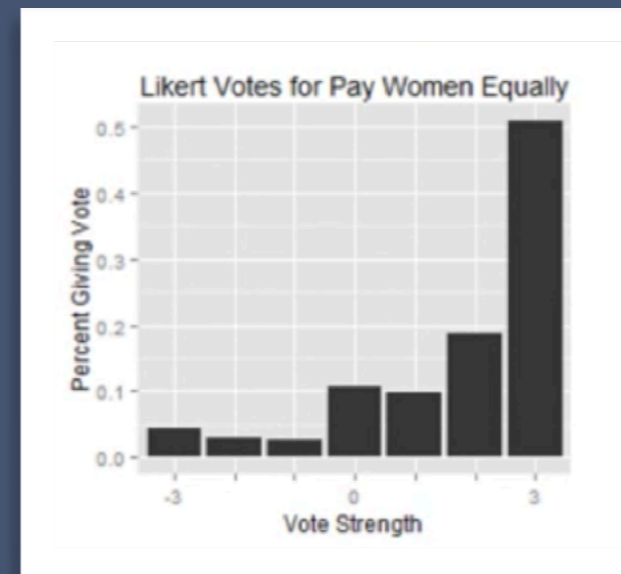
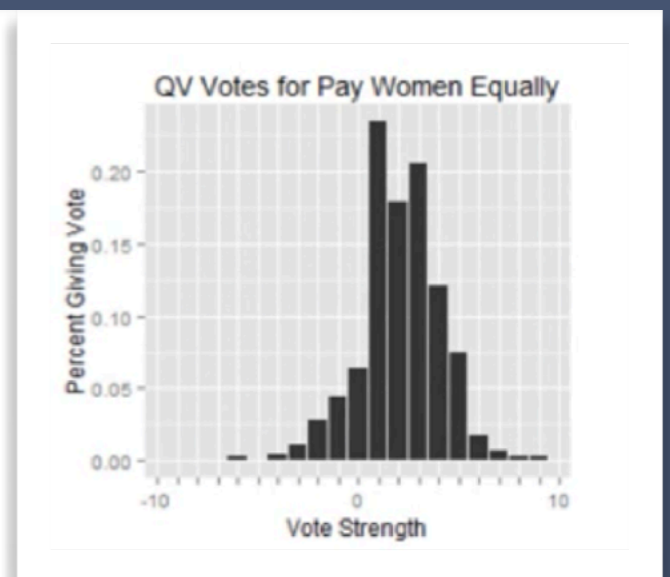
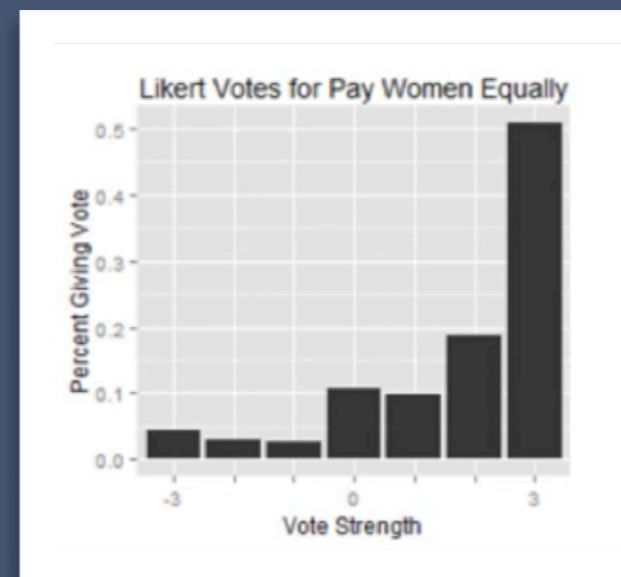


Without QV

With QV

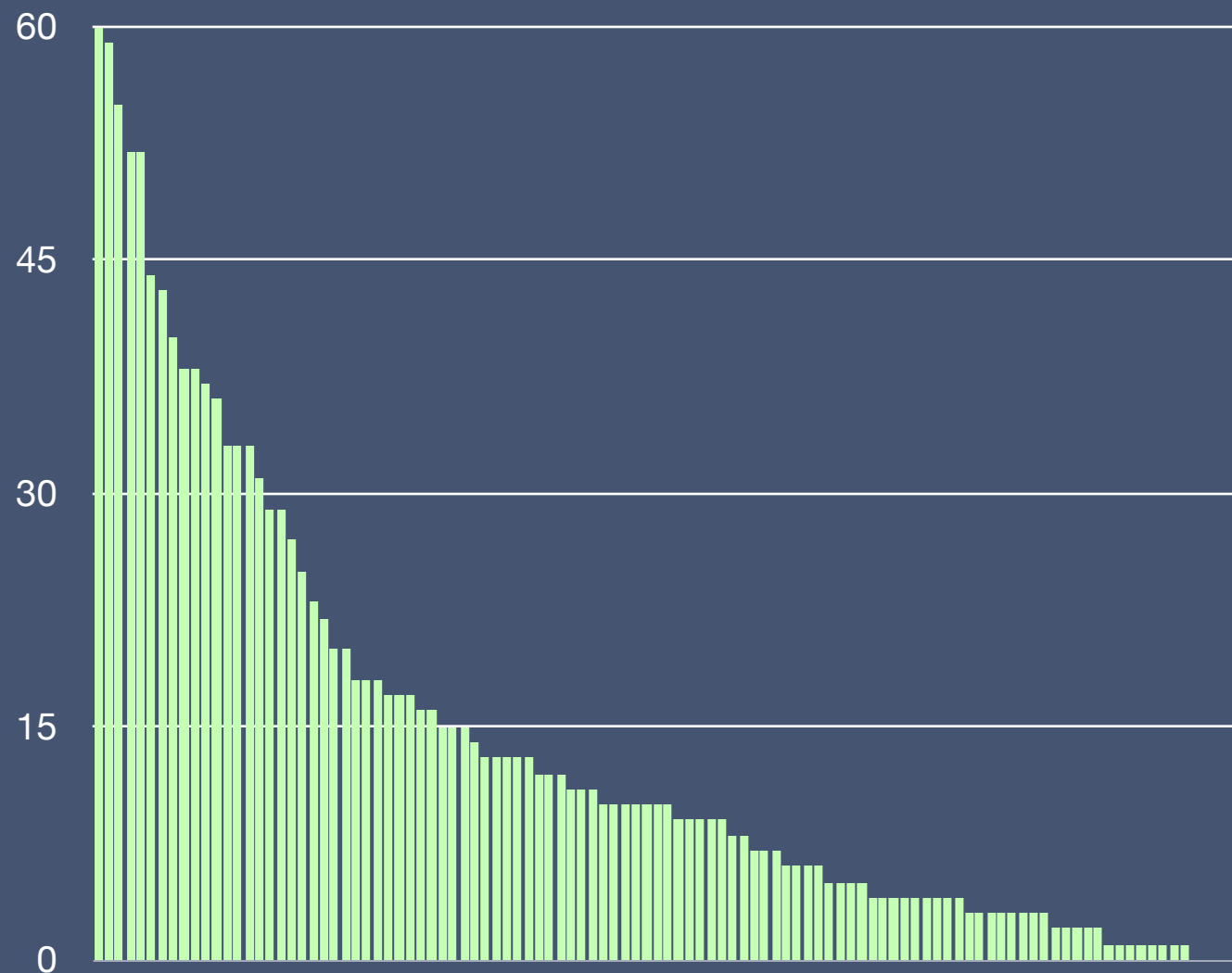
Without QV

With QV



Quadratic Voting results in Colorado (USA).

Colorado 2019 Quadratic Vote distribution:



Without Quadratic Voting:

*In 2018, before using QV, Rep. Hansen implemented a simpler version where each House Democrat received 15 votes to cast for the 15 bills they felt deserved funding. **The process generated “a big blob” of bills with roughly the same number of votes and no clear preferences.***

*“Colorado tried a new way to vote”,
Wired Magazine. March 2019*

Results from first official QV implementation by a US Government (2019).

Quadratic Voting in the press.

WIRED SUBSCRIBE

ADAM ROBERS SCIENCE 04.16.19 07:00 AM


COLORADO TRIED A NEW WAY TO VOTE: MAKE PEOPLE PAY—QUADRATICALLY



In a modified version of quadratic voting, Colorado legislators each got 100 virtual tokens to buy votes on a number of measures. "There was a pretty clear signal on which items, which bills, were the most important for the caucus to fund," says one state rep.

JOE AMON/THE DENVER POST/GETTY IMAGES

THE COLORADO SUN



The chambers of Colorado House at the Capitol. (Kathryn Scott, Special to The Colorado Sun)

POLITICS AND GOVERNMENT

\$120 million in requests and \$40 million in the bank. How an obscure theory helped prioritize the Colorado budget.

State Rep. Chris Hansen made Colorado one of the first test cases for quadratic voting in the public policy realm in the 2019 session

Bloomberg Businessweek

May 1, 2019, 4:45 AM EDT

REMARKS

A New Way of Voting That Makes Zealotry Expensive

Some lawmakers in Colorado tried so-called quadratic voting—and it worked.

By Peter Coy

An intriguing new tool of democracy just had its first test in the real world of politics, and it passed with flying colors.

The tool is called quadratic voting, and it's just as nerdy as it sounds. The concept is that each voter is given a certain number of tokens—say, 100—to spend as he or she sees fit on votes for a variety of candidates or issues. Casting one vote for one candidate or issue costs one token, but two votes cost four tokens, three votes cost nine tokens, and so on up to 10 votes costing all 100 of your tokens. In other words, if you really care about one candidate or issue, you can cast up to 10 votes for him, her, or it, but it's going to cost you all your tokens.

“

Quadratic voting is the one vote pricing rule under which voters who intend only their own gain are led, as if by an invisible hand, to advance the interests of society.

”



"The one vulnerability being exploited across all systems is Identity"

Edward Snowden — Web3 2019 (Berlin)

Humans on the Blockchain.

Is Proof of Personhood (PoP) possible?

If a PoP protocol existed, then the **social blockchain** would emerge.



Dapps pending to be built:

- Democracy
- Universal Basic Income
- Portable Credit
- Alternatives to KYC
- Fair Airdrops

Anything facing society, not capital.

Political initiatives that require Proof of Human.

Constraints: AI & Sybils.

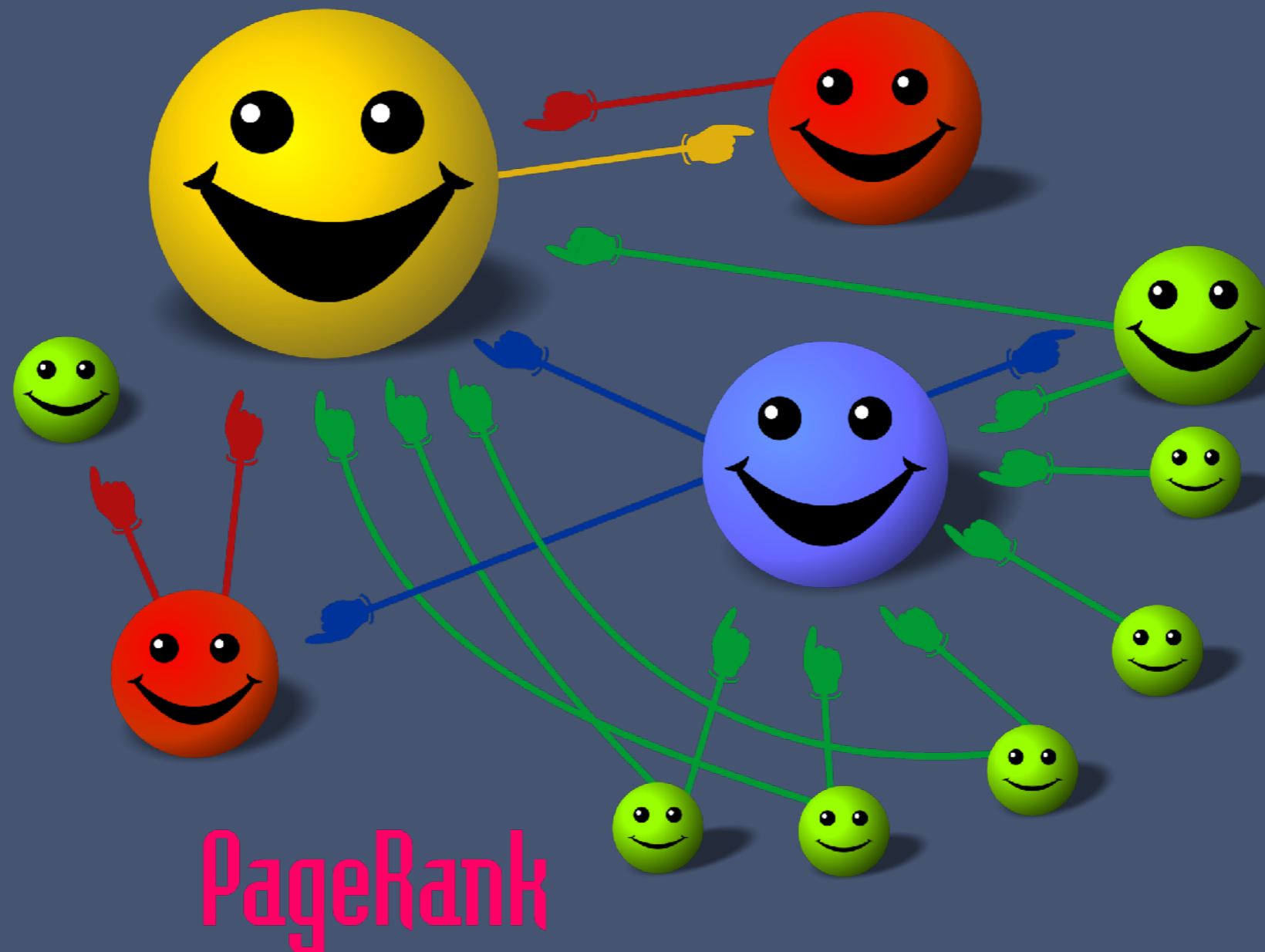
Avoid recreating either Facebook or the Chinese Communist Party.

Deep Fakes — or how cheap Information relativizes truth.



No more *uncanny valley* with Generative Adversarial Networks (GANs). These human pictures belong to people that never existed — thispersondoesnotexist.com

Reputation Algos — Prevent sybils but also centralize.

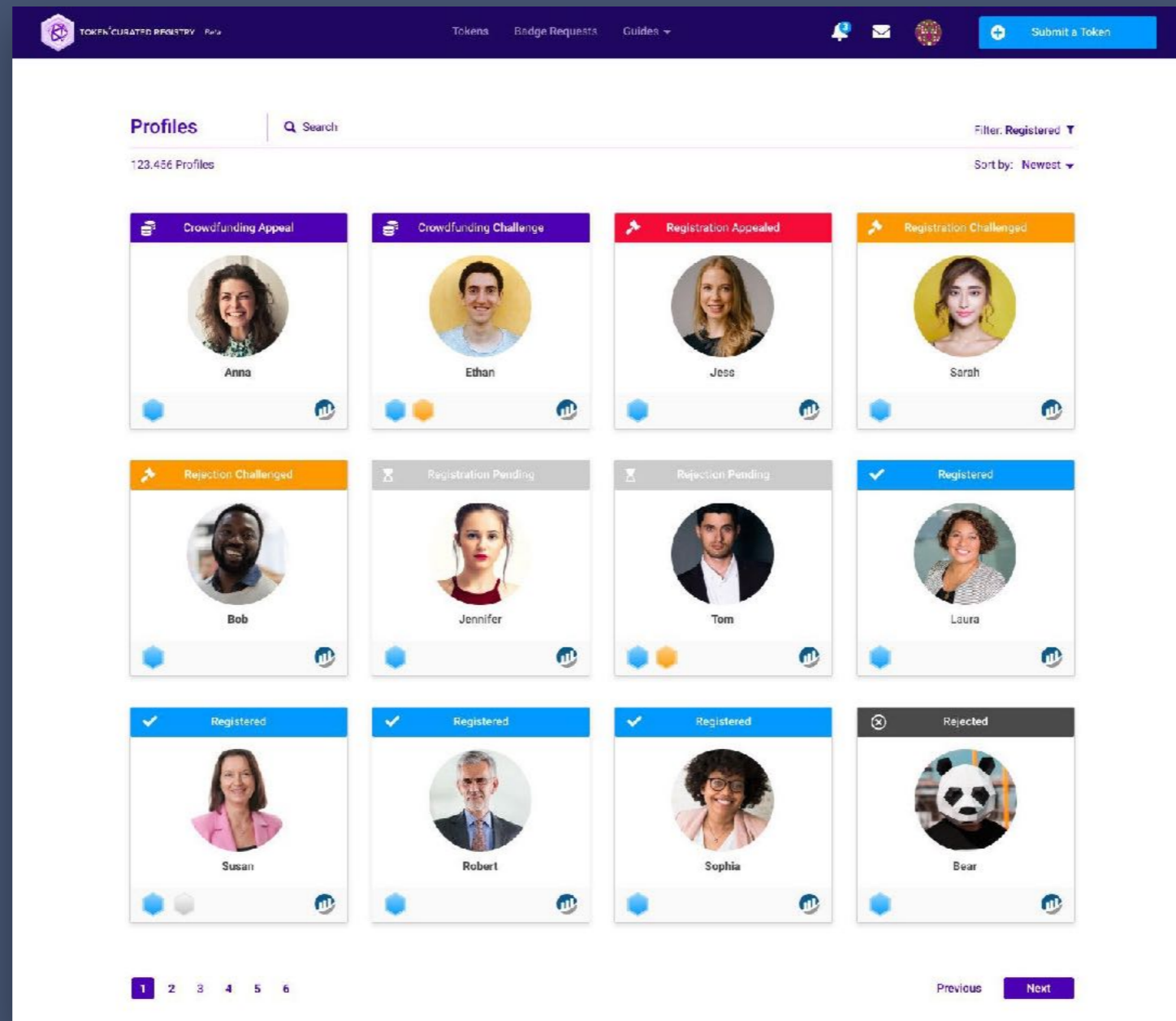


PageRank and similar algorithms lead to nodes with more centrality than others.

Proof of Personhood Prototypes.

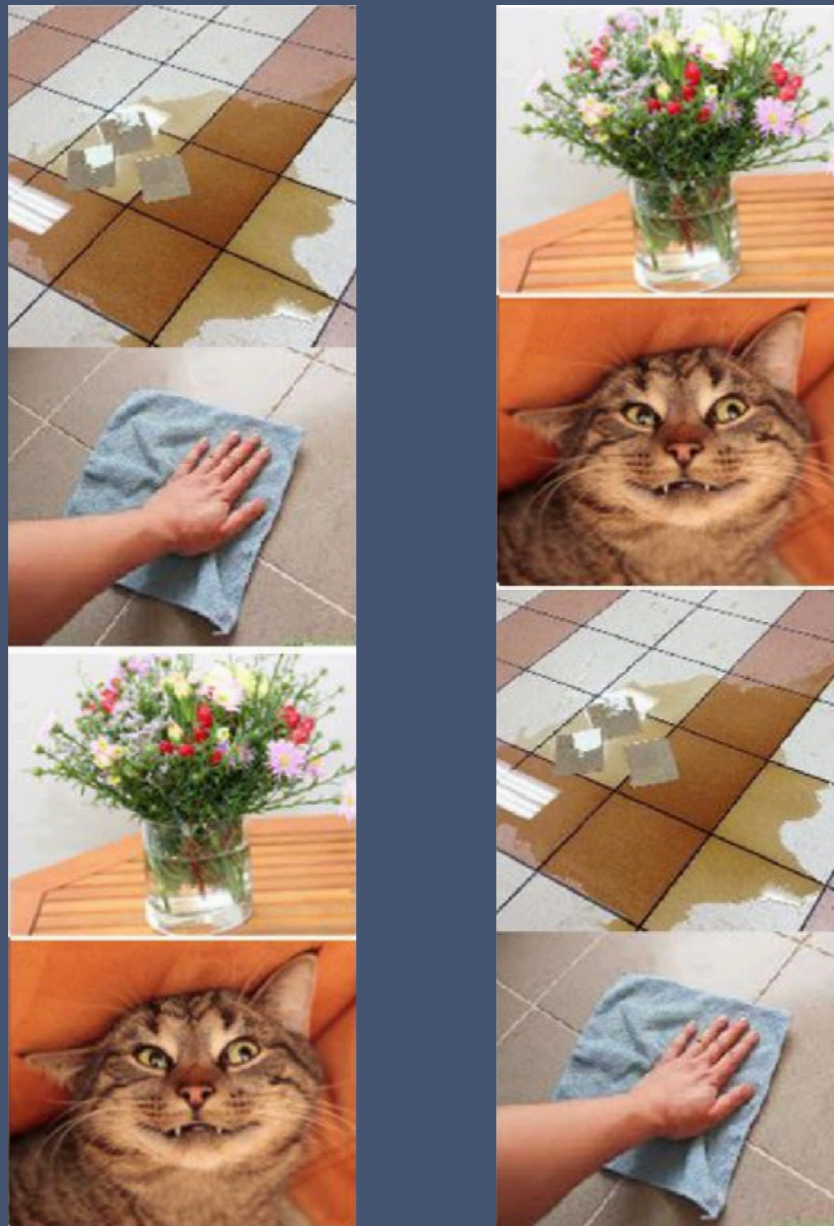
Ongoing experiments aiming to verify human participants.

Kleros — Web of Trust TCR with Video Proofs.



Use a Kleros TCR that randomly elects jurors that verify video of candidate IDs.

Ikena Network — Synchronous Turing Tests.



Ikena implements a synchronous event held over the entire network where participants are required to solve Turing tests that are hard for Machine Learning systems to solve.

This provides a proof of personhood assuming the tests cannot be captured by existing AI.

Which one of the two strips is the right one?

Idena Network — Synchronous Turing Tests.



Machine Learning resistant games:

Belonging to the class of AI-hard problems.

Not based on pattern recognition (and hence exploitable by neural networks) but able to interpret information using common sense reasoning or reading the *unsaid* between the lines.

Created by Humans.

Must not be created algorithmically in order to escape being a pattern recognition task, very much in reverse to how Google creates captchas.

Unpredictable and an infinity of possible captchas.

The range of possible tasks should not be limited (similarly as in the tasks of understanding the meaning of a text, where there can be an infinite range of texts and meanings).

No major systemic vulnerabilities.

We don't mean the vulnerability of one single captcha, but a systemic vulnerability, which allows the algorithmic solving of hundreds of thousands of captchas with high probability, above 80 percent.

Which one of the two strips is the right one?

Who Watches The Watchmen — Paper

Who Watches the Watchmen?

A Review of Subjective Approaches for Sybil-resistance in Proof of Personhood Protocols

Divya Siddarth¹, Sergey Ivliev², Santiago Siri³, and Paula Berman⁴

Keywords: decentralized identity, Sybil-protection, crypto-governance

Abstract. Most current self-sovereign identity systems may be categorized as strictly objective, consisting of cryptographically signed statements issued by trusted third party attestors. This failure to provide an input for subjectivity accounts for a central challenge: the inability to address the question of "Who verifies the verifier?". Instead, these protocols outsource their legitimacy to mechanisms beyond their internal structure, relying on traditional centralized institutions such as national ID issuers and KYC providers to verify the claims they hold. This reliance has been employed to safeguard applications from a vulnerability previously thought to be impossible to address in distributed systems: the Sybil attack problem, which describes the abuse of an online system by creating many illegitimate virtual personas. Inspired by the progress in cryptocurrencies and blockchain technology, there has recently been a surge in networked protocols that make use of subjective inputs such as voting, vouching, and interpreting, to arrive at a decentralized and sybil-resistant consensus for identity. In this article, we will outline the approaches of these new and natively digital sources of authentication - their attributes, methodologies strengths, and weaknesses - and sketch out possible directions for future developments.

Introduction

For blockchain networks to move from strictly providing financial services into enabling social and political applications, decentralized protocols for identity must be devised. Lacking reliable means to fingerprint unique human identities, most current blockchain governance practices employ Proof of Stake voting: stakeholders validate their membership through their ownership of a given cryptocurrency (or mining hardware in the case of Proof of Work). These resource-based membership systems have rendered most crypto-governance practices into plutocracies, with a few powerful players able to control choices according to their own interests (Wright, 2017; De Filippi, 2019). Clearly, this is antithetical to democratic principles. If blockchains are to become a significant public infrastructure, particularly in the space of civic engagement, then Proof of Work's "one-CPU-one-vote" or Proof of Stake's "one-dollar-one-vote" systems will not suffice: in order to enable democratic governance, protocols that signal unique human identities to enable "one-person-one-vote" systems must be created.

¹ Microsoft Research

² Perm State University

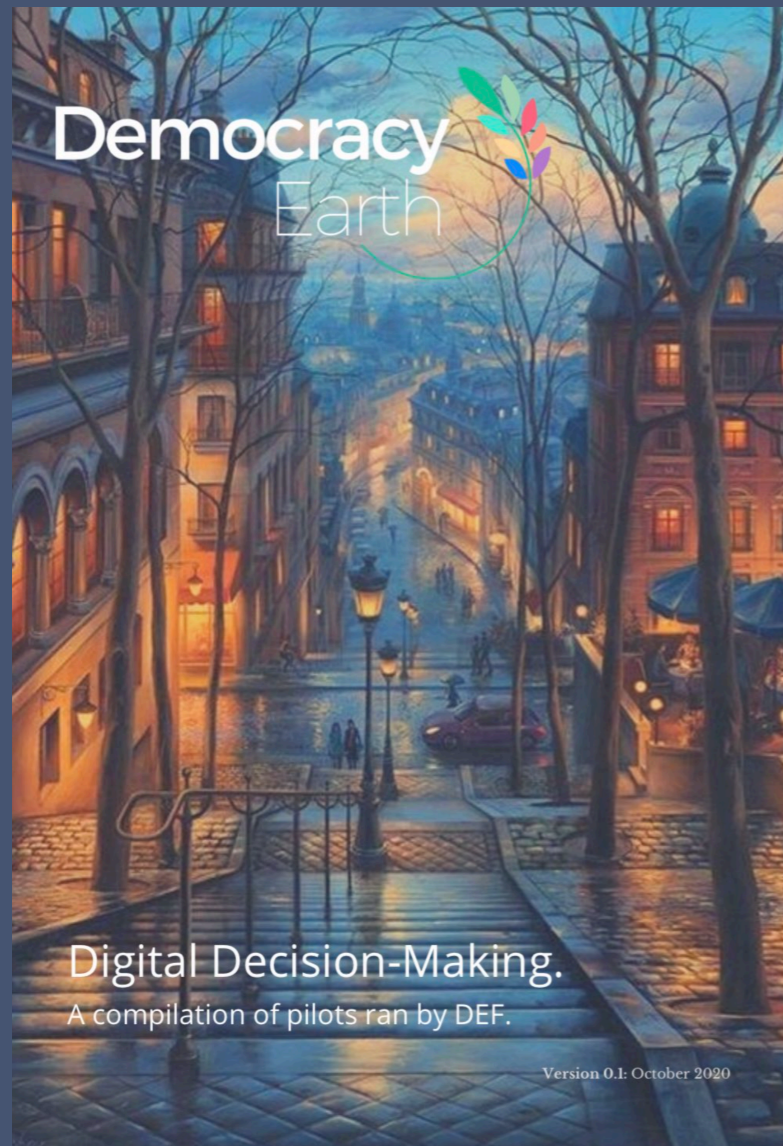
³ Democracy Earth Foundation

⁴ Re-State Foundation, Democracy Earth Foundation

In this review, we will outline the approaches of these new and natively digital sources of authentication - their attributes, methodologies strengths, and weaknesses - and sketch out possible directions for future developments.

bit.ly/personhoodproof

More about Democracy Earth



VERSION 0.1

Digital Decision-Making

Democracy Earth Foundation
democracy.earth

Paula Berman & Sofia Cossar

Democracy Earth Foundation is a U.S. (CA) 501 (c) (3) non-profit founded in 2015 building open source & censorship-resistant democracies able to be deployed anywhere where there's an internet connection. This report aims to gather, in an accessible manner, some of the data and lessons learned from pilots carried out by the Foundation over the past five years. The data collected for this report comes from primary sources, including members of Democracy Earth and organizations involved in the pilots, as well as reliable secondary sources like articles and papers documenting the experiences.

i. Introduction

"While the pandemic has had many devastating effects, it has also propelled us a few years ahead when it comes to digitalization. For politics, we have already started to see changes. Now it is time to reflect on how we can better use technology for our democracy."

Dita Charanzová, Vice-President of the European Parliament and the Coordinator of the Renew Group on the Internal Market and Consumer Protection Committee

The democratizing promise of the Internet has succeeded to transform the cultural layer of humanity, while its potential to improve the institutional layer remains mostly unrealized. Despite increasing global connectivity,¹ democracies around the world have failed to leverage technology to increase societal participation in its processes and decisions. On the contrary: the past 13 years recorded global declines in political rights and civil liberties with participation rates reaching all-time lows,² whereas 'digital authoritarianism' - governments utilizing automated surveillance systems against their citizens - is on the rise.³

The response to the COVID-19 health crisis has seen Eastern and Western governments doubling-down on their digital overreach,⁴ which is detrimental to the citizen's right to privacy, the right to participate in public affairs, and the right to access public data. In parallel, parliaments around the world⁵ have been forced to venture into digital democracy and have shifted to video-conferencing to run their debates.

¹ Internet World Stats, World Internet Users and 2020 Population Stats (2020)

² Freedom House, Freedom in the World 2019: Democracy in Retreat (2019)

³ Freedom House, Freedom on the Net 2018: The Rise of Digital Authoritarianism (2018)

⁴ S. Cossar, COVID-19 84? Data Appropriation as a Feminist Issue (Part 1) & (Part 2) (2020)

⁵ Javid-ur-Rahman, "Parliament on road to digital democracy amid coronavirus pandemic", The Nation (2020)

2

VERSION 0.1

In this context, experimenting with the possibilities offered by state-of-the-art technology to make governance practices more inclusive holds pressing relevance. From diasporas or disenfranchised populations under authoritarian regimes; to the newly-born crypto networks that need effective ways to collaborate at scale; to democratic governments in need to adapt to the demands of citizens of the 21st century, including navigating the socio-economic aftermaths of the current pandemic, the ability to provide inclusive governance through digital means will play a key role in shaping the future of our societies.

Democracy Earth Foundation is a U.S. (CA) 501 (c) (3) non-profit founded in 2015 building open source & censorship-resistant democracies able to be deployed anywhere where there's an internet connection. Backed by Y Combinator, Fast Forward, Shuttleworth Foundation and Templeton World Charity Foundation, Democracy Earth won the 2016 Global Grand Challenge of Singularity University in the Governance category and its co-Founder Santiago Siri was named Visionary of the Year 2017 in Latin America by MIT Tech Review.

"Social change is not going to come from just knowing more information, but from doing something with it."

Pia Mancini at TEDGlobal (2014)



The Foundation traces its roots to a political party in Argentina: before starting Democracy Earth, co-Founders Santiago Siri and Pia Mancini, alongside their peers in Buenos Aires, started Partido de La Red, or the Net Party. It was the first digital political party in the Americas to run for elections with candidates committed to people's will as expressed online, on the DemocracyOS platform. Their pioneering work reverberated across the globe - much aided by a viral Ted talk given by Pia Mancini⁶ - significantly contributing to the creation of several new organizations, political parties and movements with similar proposals, including Partido Digital (Digital Party) in Uruguay and joining a broader global movement towards digitizing democratic practices with a view to increasing participation in decision-making instances.

⁶ P. Mancini, How to upgrade democracy for the internet era, TEDGlobal (2014)

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bit.ly/DemocracyEarthPilots

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Democracy Earth is a 501 (c) 3 non-profit
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[democracy.earth](https://www.democracy.earth)

