ETH
Eidgenössische Technische Hochschule Zürich
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Distributed Computing

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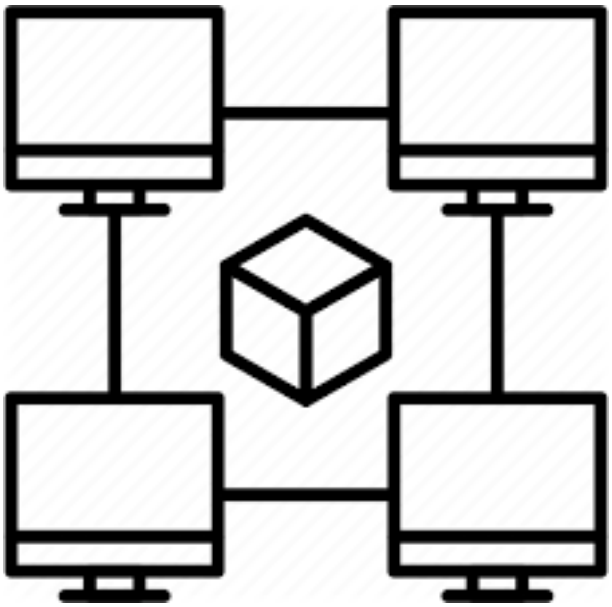
Proof of Stake Cryptocurrency Networks

Blockchain-based distributed systems—such as Bitcoin and Ethereum—are now a major part of the global financial infrastructure, and have been proposed to serve as the basis for other services like domain registries and medical records. A blockchain is, at its core, a mechanism for storing state and performing computation across a network of machines without any centralized trust. These systems run atop a global peer-to-peer (P2P) network over the internet responsible for disseminating network messages including blockchain data and information on network participants.



The structure and operation of these P2P networks directly impact the security and usability of these systems. Traditionally these networks have operated as permissionless (anyone can join), unstructured (little to no rules on who should connect to each other) networks. Such a set up is more in line with Proof-of-Work (PoW) mining based currencies (Such as Bitcoin) where a key feature is anyone is able to participate in mining at any given point.

New generations of these networks are moving to a new model of block mining called Proof-of-Stake (PoS), where users must purchase a chunk of stake in the system to be involved in the mining lottery. The objective of this thesis is to generally explore proposals for more structured network models and how existing PoS systems (e.g., Ethereum 2.0) fit into these proposals.

Candidate Profile: Prior knowledge of blockchain protocols and cryptocurrencies, while helpful, is not a requirement. An ideal candidate for this project is interested in gathering and analyzing data on existing systems as well as understanding some theoretical concepts related to graph theory and basic cryptography. *Master's* students will work on an extensive project, participating in developing the methodology of the project.

Interested? Please contact us for more details!

Contact

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