



Measuring 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. This includes susceptibility to consensus-level attacks that break foundational security guarantees such as network fairness, centralization, and the ability of actors to manipulate the network. Properties of the P2P network also directly impact user experience related to privacy, censorship, scams, and financial attacks such as arbitrage.

The objective of this thesis is to further our understanding of how these networks are operating through real-world measurements of one or more system. These measurements may include both scraping data from online sources as well as active measurements from within a cryptocurrency network.



Candidate Profile: Prior knowledge of blockchain protocols and cryptocurrencies, while helpful, is not a requirement. The main requirement of this project is a strong coding background, and ability to read and make adjustments in a new coding language (the language depends on which system(s) we decide to measure). *Master's* students will work on an extensive project, participating also in the development of the measurement methodology.

Interested? Please contact us for more details!

Contact

- Dr. Lucianna Ki er: lki ffer@ethz.ch, ETZ G97
- Lioba Heimbach: hl ioba@ethz.ch, ETZ G95