EPSRC CDT in Distributed Algorithms

PhD Project: Algorithms and Mechanisms on Blockchain

University of Liverpool

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Project Description

This project has been developed by the University of Liverpool in partnership with TriliTech.

This project is focused on studying and designing mechanisms on decentralized settings and particularly on blockchains. The field of (Algorithmic) Mechanism Design has been well studied for many years. Blockchain is a distributed ledger that stores records of peer-to-peer transactions (and not only with the advent of smart contracts), with the underlying goal of being decentralised and publicly accessible. Permissionless blockchains such as Bitcoin, Ethereum and Tezos have their own native currency. Such difference enlarges the design space and hence certain known mechanisms need to be modified or new ones need to be designed from scratch.

Moreover, blockchain is a dynamically changing environment and it can be considered as repeated game. Thus, in this project we will study the equilibria and the dynamics of such games.

Certain blockchains, such as Tezos have on-chain governance, whereby users can vote for amendments of the network. This is a totally novel field and the design of truthful and socially optimal mechanisms is worth studying.

Our collaboration with TriliTech is critical since it will give us the opportunity to test our theoretic results by conducting experimental evaluations with real data. TriliTech and the industrial supervisor Mr. Arthur Breitman, the co-founder of Tezos will give us handful directions about the needs of the blockchain industry.

Blockchain is a setting that captures multiple fields of research such as computer science, cryptography, (macro and micro)-economics and hence the open problems that arise are multidisciplinary.

Go to the EPSRC CDT In Distributed Algorithms website.