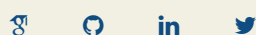


Kaihua Qin

Curriculum Vitae

September 2021

📍 China & UK
🏠 kaihuaqin.com
✉ kaihua.qin@imperial.ac.uk



Research Interests

My research interests span blockchains and system security with a recent focus on decentralized finance (DeFi). DeFi is one of the most promising applications of blockchains. I'm motivated to understand the risks and vulnerabilities of the DeFi ecosystem. Many of the DeFi security issues are caused by the inherent properties of blockchains and flawed protocol designs. In my research, I'm trying to improve the security of DeFi from both the underlying blockchain and the high-level DeFi protocol perspective.

Education and Qualifications

- 2019–** **Ph.D. Imperial College London, UK**
 - > Centre for Cryptocurrency Research and Engineering
 - > Advisor: Dr. Arthur Gervais
 - > Focus on security, privacy, mechanism design, etc. related to blockchains and cryptocurrencies
- 2014–2015** **M.Sc. Imperial College London, UK**
 - > Major in Communications and Signal Processing
 - > Advisor: Dr. Wei Dai
 - > Degree with Distinction (top 10%)
- 2010–2014** **B.Sc. Southeast University, China**
 - > Major in Information Engineering
 - > GPA 87% (top 15%)
 - > Mitsubishi Electric Scholarship, Excellent Award in Innovation Practice, numerous course scholarships

Professional Experience

- 2016–2018 Software Engineer CISCO**
 - > Working on high-availability features for the cBR-8 and Remote PHY Device product lines including supervisor card HA, line card HA, in-service software upgrade and L2TP stateful switchover.
 - > Founding team member working on innovative NoSQL solutions of real-time data storage and recovery for cBR-8.

Publications [Google Scholar](#)

Preprint

- > *A2MM: Mitigating Frontrunning, Transaction Reordering and Consensus Instability in Decentralized Exchanges*
Liyi Zhou, **Kaihua Qin**, Arthur Gervais
- > *CeFi vs. DeFi — Comparing Centralized to Decentralized Finance*
Kaihua Qin*, Liyi Zhou*, Yaroslav Afonin, Ludovico Lazzaretti, Arthur Gervais (*equal contribution)
- > *Quantifying Blockchain Extractable Value: How dark is the forest?*
Kaihua Qin, Liyi Zhou, Arthur Gervais

Peer-reviewed

- > *An Empirical Study of DeFi Liquidations: Incentives, Risks, and Instabilities*
Kaihua Qin, Liyi Zhou, Pablo Gamito, Philipp Jovanovic, Arthur Gervais
ACM Internet Measurement Conference (IMC'21)
- > *On the Just-In-Time Discovery of Profit-Generating Transactions in DeFi Protocols*
Liyi Zhou, **Kaihua Qin**, Antoine Cully, Benjamin Livshits, Arthur Gervais
IEEE Symposium on Security and Privacy (S&P'21)
- > *High-Frequency Trading on Decentralized On-Chain Exchanges*
Liyi Zhou, **Kaihua Qin**, Christof Ferreira Torres, Duc V Le, Arthur Gervais
IEEE Symposium on Security and Privacy (S&P'21)
- > *Attacking the DeFi Ecosystem with Flash Loans for Fun and Profit*
Kaihua Qin, Liyi Zhou, Benjamin Livshits, Arthur Gervais
Financial Cryptography and Data Security (FC 2021)

- > *FileBounty: Fair Data Exchange*
Simon Janin*, **Kaihua Qin***, Akaki Mamageishvili, Arthur Gervais (*equal contribution)
IEEE European Symposium on Security and Privacy Workshops (S&B'20)
- > *Applying private information retrieval to lightweight bitcoin clients*
Kaihua Qin, Henryk Hadass, Arthur Gervais, Joel Reardon
Crypto Valley Conference on Blockchain Technology (CVCBT 2019)

Report

- > *An overview of blockchain scalability, interoperability and sustainability*
Kaihua Qin, Arthur Gervais

Talks

- > 2021/05/25@IEEE Symposium on Security and Privacy
On the Just-In-Time Discovery of Profit-Generating Transactions in DeFi Protocols
- > 2021/05/19@Theory and Practice of Blockchains
Attacking the DeFi Ecosystem with Flash Loans for Fun and Profit
- > 2021/03/01@Financial Cryptography and Data Security
Attacking the DeFi Ecosystem with Flash Loans for Fun and Profit
- > 2020/09/07@IEEE Security & Privacy on the Blockchain
FileBounty: Fair Data Exchange
- > 2020/06/05@Open Blockchain — Workshop Series
Attacking the DeFi Ecosystem with Flash Loans for Fun and Profit
- > 2019/06/25@Crypto Valley Conference on Blockchain Technology
Applying Private Information Retrieval to Lightweight Bitcoin Clients

Recent honours and awards

2019	Scaling Bitcoin Workshop	Subsidy
2013	Mathematical Contest in Modeling	Honorable Mention
2013	National Undergraduate Electronic Design Contest	First Prize
2013	Southeast University 16th Extra-Curricular Academic Technology Works Competition	Second Prize

Projects

Blockchain Workbench

- > <https://blockchainworkbench.com> 2019
- > I design, implement and maintain Blockchain Workbench, a blockchain online learning platform. This platform aims to provide basic knowledge of blockchains and interactive solidity programming exercises to beginners. Blockchain Workbench has been used as the solidity educational platform for the blockchain courses at Imperial College London and HSLU.

Teaching

Decentralized Finance

- by Dan Boneh, Arthur Gervais, Andrew Miller, Christine Parlour, Dawn Song MOOC
- > *Teaching Assistant* Autumn'21

Principles of Distributed Ledgers

- by Arthur Gervais Imperial College London
- > *Teaching Assistant* Spring'20, Spring'21

Skills & Others

Languages	Chinese — Native Speaker, English — Fluent
Programming	Advanced in Go, Python, C/C++, Proficient in Javascript, Rust
Machine Learning	Familiar with deep learning and reinforcement learning
Operating Systems	Linux, macOS, Windows