

I focus on **Security** and **Privacy**. My work often integrates **System Analysis**<sup>1</sup> and **Machine Learning** methodologies, particularly within the domains of Blockchain, Decentralized Finance (DeFi) and Blockchain Extractable Value (**BEV**<sup>2</sup>).

Affiliations

Computer Science Lecturer (~Assistant Professor) @ **The Univeristy of Sydney**  
Co-founder @ **Decentralized Intelligence AG (D23E)**

June 2024 – Present  
Dec 2022 – Present

Publications

The **CORE ranking** is one assessment metric for academic conference quality. Of the 792 assessed venues, **A\*** occupies the top 7.45%, whereas **A** encompasses the top 16.41%. The first author indicates a primary contribution, “co-first(\*)” authors denote equivalent principal contributions, following authors are sequenced by diminishing contributions, and the last author(s) signify supervisory roles.

**SoK: Decentralized Finance (DeFi) Attacks** **Security**

Liyi Zhou, Xihan Xiong, Jens Ernstberger, Stefanos Chaliasos, Zhipeng Wang, Ye Wang, Kaihua Qin, Roger Wattenhofer, Dawn Song, Arthur Gervais  
**A\*** *IEEE Symposium on Security and Privacy (SP’23)*

**High-Frequency Trading on Decentralized On-Chain Exchanges** **Security** **BEV**

Liyi Zhou, Kaihua Qin, Christof Ferreira Torres, Duc V Le, Arthur Gervais.  
**A\*** *IEEE Symposium on Security and Privacy (SP’21)*

**On the Just-In-Time Discovery of Profit-Generating Transactions in DeFi Protocols** **Security** **BEV** **System Analysis**

Liyi Zhou, Kaihua Qin, Antoine Cully, Benjamin Livshits, Arthur Gervais.  
**A\*** *IEEE Symposium on Security and Privacy (SP’21)*

**Quantifying Blockchain Extractable Value: How dark is the forest?** **Security** **BEV**

Kaihua Qin, Liyi Zhou, Arthur Gervais.  
**A\*** *IEEE Symposium on Security and Privacy (SP’22)*

**Speculative Denial-of-Service Attacks in Ethereum** **Security**

Aviv Yaish, Kaihua Qin, Liyi Zhou, Aviv Zohar, Arthur Gervais.  
**A\*** *Usenix Security Symposium (USENIX-Security’24)*

**The Blockchain Imitation Game** **Security** **BEV** **System Analysis**

Kaihua Qin, Stefanos Chaliasos, Liyi Zhou, Ben Livshits, Dawn Song, Arthur Gervais.  
**A\*** *Usenix Security Symposium (USENIX-Security’23)*

**Blockchain Censorship** **Security**

Anton Wahrstätter, Jens Ernstberger, Aviv Yaish, Liyi Zhou, Kaihua Qin, Taro Tsuchiya, Sebastian Steinhorst, Davor Svetinovic, Nicolas Christin, Mikolaj Barcentewicz, Arthur Gervais  
**A\*** *International World Wide Web Conference (WWW’24)*

**On How Zero-Knowledge Proof Blockchain Mixers Improve, and Worsen User Privacy** **Privacy**

Zhipeng Wang, Stefanos Chaliasos, Kaihua Qin, Liyi Zhou, Lifeng Gao, Pascal Berrang, Ben Livshits, Arthur Gervais  
**A\*** *International World Wide Web Conference (WWW’23)*

**Smart Contract and Defi Security Tools: Do They Meet the Needs of Practitioners?** **Security**

Stefanos Chaliasos, Marcos Antonios Charalambous, Liyi Zhou, Rafaila Galanopoulou, Arthur Gervais, Dimitris Mitropoulos, Ben Livshits.  
**A\*** *International Conference on Software Engineering (ICSE’24)*

**Mitigating Decentralized Finance Liquidations with Reversible Call Options** **BEV**

Kaihua Qin, Jens Ernstberger, Liyi Zhou, Philipp Jovanovic, Arthur Gervais  
**A** *Financial Cryptography and Data Security (FC’23)*

**Attacking the DeFi ecosystem with flash loans for fun and profit** **Security** **System Analysis**

Kaihua Qin, Liyi Zhou, Benjamin Livshits, Arthur Gervais.  
**A** *Financial Cryptography and Data Security (FC’21)*

**An Empirical Study of DeFi Liquidations: Incentives, Risks, and Instabilities** **BEV**

Kaihua Qin, Liyi Zhou, Pablo Gamito, Philipp Jovanovic, Arthur Gervais.  
**A** *ACM Internet Measurement Conference (IMC’21)*

**SoK: Data Sovereignty**

Jens Ernstberger, Jan Lauinger, Fatima Elsheimy, Liyi Zhou, Sebastian Steinhorst, Ran Canetti, Andrew Miller, Arthur Gervais, Dawn Song.  
*IEEE European Symposium on Security and Privacy (EuroS&P’23)*

**Cyclic Arbitrage in Decentralized Exchanges** **BEV**

Ye Wang, Yan Chen, Haotian Wu, Liyi Zhou, Shuiguang Deng, Roger Wattenhofer.  
*Companion Proceedings of the Web Conference (WWW’22)*

**CeFi vs. DeFi – Comparing Centralized to Decentralized Finance**

Kaihua Qin\* (equal), Liyi Zhou\* (equal), Arthur Gervais.  
*Crypto Valley Conference (CVC’21)*

Preprints

**Do You Need a Zero Knowledge Proof?** **Security** **Machine Learning**

Isaac David, Liyi Zhou, Kaihua Qin, Dawn Song, Lorenzo Cavallaro, Arthur Gervais.  
**Do you still need a manual smart contract audit?** **Security** **Machine Learning**

Jens Ernstberger, Stefanos Chaliasos, Liyi Zhou, Philipp Jovanovic, Arthur Gervais.

**Blockchain Large Language Models** **Security** **Machine Learning**

Yu Gai\* (equal), Liyi Zhou\* (equal), Kaihua Qin, Dawn Song, Arthur Gervais.

**Time to Bribe: Measuring Block Construction Market** **Security**

Anton Wahrstätter, Liyi Zhou, Kaihua Qin, Davor Svetinovic, Arthur Gervais.

**Towards Automated Security Analysis of Smart Contracts based on Execution Property Graph** **Security**

Kaihua Qin, Zhe Ye, Zhun Wang, Weilin Li, Liyi Zhou, Chao Zhang, Dawn Song, Arthur Gervais.

**A2MM: Mitigating Frontrunning, Transaction Reordering and Consensus Instability in Decentralized Exchanges** **BEV** **System Analysis**

Liyi Zhou, Kaihua Qin, Arthur Gervais.

Teaching

**Guest Lecturer** @ The Hong Kong Polytechnic University, Speculative DoS attacks  
**Guest Lecturer** @ Univeristy College London, CeFi vs DeFi  
**Guest Lecturer** @ University of Zurich Summer School, Smart contract security  
**Teaching Assistant** @ **DeFi MOOC** (Stanford, UC Berkeley, UIUC, and UCL)

March 2024  
December 2023  
July 2023  
2021, 2022

Services

**Program Committee Co-Chair**  
ACM CCS Workshop on Decentralized Finance and Security  
**Program Committee**  
**A** Financial Cryptography and Data Security (FC)  
The Science of Blockchain (SBC)  
The Latest in DeFi Research (TL;DR),  
CESC Crypto Economics Security Conference  
ACM CCS Workshop on Decentralized Finance and Security  
**Invited Reviewer**  
Transactions on Information Forensics & Security  
Financial Innovation  
Transactions on Dependable and Secure Computing  
**External Reviewer**  
IEEE Symposium on Security and Privacy

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2021, 2022, 2023  
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Grants

UC Berkeley RDI Frontier Research Fellows, 20k USD, DeFi’s Composable Quirks,  
**Ethereum Academic Grant 2023**, 72k USD, Blockchain Censorship DoS (part of a team),  
**Ethereum Academic Grant 2023**, 25k USD, Blockchain Censorship Measurement (part of a team)  
Ethereum Academic Grant 2024, 55k USD, Training an EVM-native GPT (part of a team)

Not-started  
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Talks

**Web3 Scholar Conference**, Hong Kong  
**Ecole Polytechnique**, Blockchain@polytechnique-OMI workshop  
**Imperial College London Summer School**, DeFi Hack Detection and Prevention  
**Second DeFi Security Summit (DSS Paris)**, DeFi Hack Detection and Prevention  
**The Hong Kong Polytech University**, Real-time DeFi IDS/IPS  
**0xU Hong Kong Blockchain Club**, Real-time DeFi IDS/IPS  
**Decentralised Finance Research Group Oxford–Man Institute**, Real-time DeFi IDS/IPS  
**8th International Workshop P2PFISY workshop DeFi Attacks**  
**The Science of Blockchain (SBC) Dark Forest**  
**IEEE S&P**, Dark Forest  
**IEEE S&P**, High Frequency Trading (Sandwich Attacks)  
**Monash University**, DeFi Security (Invited Presentation)  
**University of Guelph**, DeFi Security (Group Research Seminar)

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Education

**PhD candidate in Computer Science**  
Supervisor: Professor Arthur Gervais  
**MRes in Web Science and Big Data Analytics**  
Supervisor: Associate Professor Shi Zhou  
**MSci & ARCS in Mathematics and Computer Science (4 years)**  
Supervisor: Professor Yike Guo / Research Professor Chao Wu

Imperial College London  
Oct 2019 – Present  
University College London  
Oct 2017 – Sep 2018  
Imperial College London  
Oct 2010 – Sep 2014

Experiences

Research Intern @ **Chainlink Labs**, London, United Kingdom  
Software Engineer @ **Imperial College London**, Data Science Institute, United Kingdom  
Full-Stack Software Engineer @ **Automic**, Sydney, Australia  
Software Engineer @ **SuperChoice**, Sydney, Australia  
Internship @ **NewVoiceMedia**, Basingstoke, United Kingdom  
Internship @ **J P Morgan**, London, United Kingdom

Sep 2022 – Dec 2022  
24th June 2019 – 7th Oct 2019  
23rd Mar 2017 – 20th June 2017  
20th Oct 2014 – 4th Jan 2016  
3rd Jun 2013 – 20th Sep 2013  
25th July 2012 – 31st Aug 2012

<sup>1</sup> **System Analysis** denotes the examination of systems using algorithmic techniques, such as taint analysis, SMT solvers, optimization, and transaction synthesis.  
<sup>2</sup> **BEV** refers to the opportunity to extract value from transaction order manipulation, encompassing activities like arbitrage, liquidations, attacks, and more.