

I focus on **Security** and **Privacy**. My work often integrates **System Analysis**¹ and **Machine Learning** methodologies, particularly within the domains of Blockchain, Decentralized Finance (DeFi) and Blockchain Extractable Value (BEV²).

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 Barczentewicz, 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)

¹ **System Analysis** denotes the examination of systems using algorithmic techniques, such as taint analysis, SMT solvers, optimization, and transaction synthesis.

² **BEV** refers to the opportunity to extract value from transaction order manipulation, encompassing activities like arbitrage, liquidations, attacks, and more.

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?

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

March 2024

Guest Lecturer @ Univeristy College London, CeFi vs DeFi

December 2023

Guest Lecturer @ University of Zurich Summer School, Smart contract security

July 2023

Teaching Assistant @ DeFi MOOC (Stanford, UC Berkeley, UIUC, and UCL)

2021, 2022

Services

Program Committee Co-Chair

ACM CCS Workshop on Decentralized Finance and Security

2024

Program Committee

A Financial Cryptography and Data Security (FC)

2024

The Science of Blockchain (SBC)

2023, 2024

The Latest in DeFi Research (TL;DR),

2024

CESC Crypto Economics Security Conference

2022

ACM CCS Workshop on Decentralized Finance and Security

2021, 2022, 2023

Invited Reviewer

Transactions on Information Forensics & Security

2023

Financial Innovation

2021, 2022, 2023, 2024

Transactions on Dependable and Secure Computing

2023

External Reviewer

IEEE Symposium on Security and Privacy

2023

Grants

UC Berkeley RDI Frontier Research Fellows, 20k USD, DeFi's Composable Quirks,

Not-started

Ethereum Academic Grant 2023, 72k USD, Blockchain Censorship DoS (part of a team),

Completed

Ethereum Academic Grant 2023, 25k USD, Blockchain Censorship Measurement (part of a team)

Completed

Ethereum Academic Grant 2024, 55k USD, Training an EVM-native GPT (part of a team)

Not-started

Talks

Web3 Scholar Conference, Hong Kong

2024

Ecole Polytechnique, Blockchain@polytechnique-OMI workshop

2023

Imperial College London Summer School, DeFi Hack Detection and Prevention

2023

Second DeFi Security Summit (DSS Paris), DeFi Hack Detection and Prevention

2023

The Hong Kong Polytech University, Real-time DeFi IDS/IPS

2023

0xU Hong Kong Blockchain Club, Real-time DeFi IDS/IPS

2023

Decentralised Finance Research Group Oxford–Man Institute, Real-time DeFi IDS/IPS

2023

8th International Workshop P2PFISY workshop DeFi Attacks

2022

The Science of Blockchain (SBC) Dark Forest	2022
IEEE S&P , Dark Forest	2022
IEEE S&P , High Frequency Trading (Sandwich Attacks)	2021
Monash University , DeFi Security (Invited Presentation)	2021
University of Guelph , DeFi Security (Group Research Seminar)	2021

Education	PhD candidate in Computer Science	Imperial College London
	Supervisor: Professor Arthur Gervais	<i>Oct 2019 – Present</i>
	MRes in Web Science and Big Data Analytics	University College London
	Supervisor: Associate Professor Shi Zhou	<i>Oct 2017 – Sep 2018</i>
	MSci & ARCS in Mathematics and Computer Science (4 years)	Imperial College London
	Supervisor: Professor Yike Guo / Research Professor Chao Wu	<i>Oct 2010 – Sep 2014</i>

Experiences	Research Intern @ Chainlink Labs , London, United Kingdom	<i>Sep 2022 – Dec 2022</i>
	Software Engineer @ Imperial College London , Data Science Institute, United Kingdom	<i>24th June 2019 – 7th Oct 2019</i>
	Full-Stack Software Engineer @ Automic , Sydney, Australia	<i>23rd Mar 2017 – 20th June 2017</i>
	Software Engineer @ SuperChoice , Sydney, Australia	<i>20th Oct 2014 – 4th Jan 2016</i>
	Internship @ NewVoiceMedia , Basingstoke, United Kingdom	<i>3rd Jun 2013 – 20th Sep 2013</i>
	Internship @ J P Morgan , London, United Kingdom	<i>25th July 2012 – 31st Aug 2012</i>