

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 University of Sydney** June 2024 – Present  
Co-founder @ **Decentralized Intelligence AG (D23E)** 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** **Privacy** **BEV**

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)*

<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.

## 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 (ACM CCS A\* Co-located Event)

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 (ACM CCS A\* Co-located Event)

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

A\* IEEE Symposium on Security and Privacy

2023

### Grants

[Innosuisse Start-Up Innovation Project](#), 703k CHF (~770k USD), AI-Enhanced Smart Contract Auditing

Ongoing, 2024

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

Not-started, 2024

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

Not-started, 2024

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

Completed, 2023

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

Completed, 2023

### 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

<b>8th International Workshop P2PFISY workshop DeFi Attacks</b>	2022
<b>The Science of Blockchain (SBC) Dark Forest</b>	2022
<b>IEEE Symposium on Security and Privacy, Dark Forest</b>	2022
<b>IEEE Symposium on Security and Privacy, High Frequency Trading (Sandwich Attacks)</b>	2021
<b>Monash University, DeFi Security (Invited Presentation)</b>	2021
<b>University of Guelph, DeFi Security (Group Research Seminar)</b>	2021

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

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