

Zerui Cheng

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EDUCATION

Princeton University, Electrical and Computer Engineering	Aug 2023 - Jul 2028 (anticipated)
<i>Ph.D. student, working on blockchains and AI, Advisor: Prof. Pramod Viswanath</i>	<i>Current GPA: 4.00/4.00</i>
Tsinghua University, “Yao Class” Talent Program	Aug 2019 - Jun 2023
<i>B.Eng. with Hons in Computer Science, summa cum laude, “Yao Award” recipient</i>	<i>GPA: 3.91/4.00</i>

PAPERS

1. **Zerui Cheng**, Edoardo Contente, Ben Finch, Oleg Golev, Jonathan Hayase, Andrew Miller, Niusha Moshrefi, Anshul Nasery, Sandeep Nailwal, Sewoong Oh, Himanshu Tyagi, and Pramod Viswanath. “OML: Open, Monetizable, and Loyal AI”, in *arXiv preprint arXiv:2411.03887* (2024).
2. Suma Bhat, Canhui Chen, **Zerui Cheng**, Zhixuan Fang, Ashwin Hebbbar, Sreeram Kannan, Ranvir Rana, Peiyao Sheng, Himanshu Tyagi, Pramod Viswanath, and Xuechao Wang. “SAKSHI: Decentralized AI Platforms”, in *arXiv preprint arXiv:2307.16562* (2023).
3. Canhui Chen*, **Zerui Cheng***, Shutong Qu, and Zhixuan Fang. “Crowdsourcing Work as Mining: A Decentralized Computation and Storage Paradigm”, In *Proceedings of the 7th Asia-Pacific Workshop on Networking*, pp. 174-175. 2023 (* denotes co-first author).
4. Tiancheng Xie, Jiaheng Zhang, **Zerui Cheng**, Fan Zhang, Yupeng Zhang, Yongzheng Jia, Dan Boneh, and Dawn Song. “zkBridge: Trustless cross-chain bridges made practical”, in *Proceedings of the 2022 ACM SIGSAC Conference on Computer and Communications Security* (pp. 3003-3017).

INDUSTRIAL EXPERIENCE

JQ Investment, Quantitative Research Intern	Aug 2024 - Sep 2024
Quantitative research intern at JQ Investment (Shanghai). Working on chasing alpha in a dynamic market through large-scale data analysis.	
Sentient, AI Fellow	May 2024 - Aug 2024
AI Fellow at sentient.foundation. Working on OML (Open, Monetizable, Loyal) for intellectual property protection of AI models with AI-native cryptographic primitives. First author of the Sentient whitepaper on OML. Collaborating closely with Prof. Sewoong Oh and Prof. Pramod Viswanath.	
PolyHedra, Intern	Jul 2022 - Dec 2022
Intern at polyhedra.network. Working on the implementation of cross-chain bridges backed by zero-knowledge proof (zkBridge). Collaborating closely with Tiancheng Xie.	

ACADEMIC HONORS AND AWARDS

First-year Fellowship for Graduate student at Princeton University	Aug 2023
Excellent Diploma Thesis Award at Tsinghua University 5 out of 94 are selected in Yao Class.	Jun 2023
Yao Class Departmental summa cum laude 23 out of 94 students are selected in Yao Class.	Jun 2023

Yao Award (the most prestigious honor for a Yao Class student) Bronze Medal (Top 6 in Yao Class), with winning rate $\leq 10\%$ across all Yao Class students.	Sep 2022
Scholarship for Comprehensive Excellence in All Aspects	Sep 2022
Scholarship for Excellence in Academic Achievements	Sep 2021
Scholarship for Excellence in Scientific and Technological Innovation	Sep 2021
Scholarship for Excellence in Social Activities and Voluntary Work	Sep 2020
Xuetang Scholarship (Tuition Fee Exemption for Undergraduate Study) Only awarded to a small portion of selected students in “Xuetang talent program”.	Annual, 2019 - 2023

COMPETITION HONORS AND AWARDS

CODING COMPETITIONS - ICPC CONTESTS

4th Place in ICPC¹ Greater New York Regional Contest 2024 Member of team “Princeton-We Play with Mud in the Northeast”. Final scoreboard: http://acmgnyr.org/year2024/scoreboard/ The only team in Princeton that qualified for ICPC North America Championship 2025.	Oct 2024
22nd Place in ICPC North America Championship 2024 Member of team “Princeton-1”. Final scoreboard: https://image.icpc.global/nac2024/scoreboard/index.html Awardee of “First Solution in the Contest” “First Solve of Problem D” (prize: \$3000).	May 2024
3rd Place in ICPC Greater New York Regional Contest 2023 Member of team “Princeton-1”. Final scoreboard: http://acmgnyr.org/year2023/scoreboard_final/index.html The only team in Princeton that qualified for ICPC North America Championship 2024.	Oct 2023
Silver Medal in CCPC² Mianyang Site	Oct 2022
Gold Medal in CCPC Harbin Site 7 th place across China nationwide.	Nov 2021
Gold Medal in ICPC Yinchuan Regional Contest 5 th place across China nationwide.	May 2021
Silver Medal in ICPC East-Asia Continental Final	Apr 2021
Gold Medal in CCPC Changchun Site 8 th place across China nationwide.	Nov 2020

CODING COMPETITIONS - OI (OLYMPIAD IN INFORMATICS)

Silver Medal in Chinese National Olympiad in Informatics * 2 65 th place across China nationwide in 2018.	Jul 2017, Jul 2018
Gold Medal in Chinese Team Selection Contest for Informatics Olympiad 2018 14 th place across China nationwide.	May 2018
1st Place in Anhui Provincial Olympiad in Informatics 2018	Apr 2018
Gold Medal in China National Olympiad in Informatics Winter Camp 2018 12 th place across China nationwide.	Jan 2018

CODING COMPETITIONS - ONLINE CODING COMPETITIONS

93th worldwide (top 0.4%) in Meta HackerCup 2024 Scoreboard: https://www.facebook.com/codingcompetitions/hacker-cup/2024/round-3/scoreboard	Nov 2024
124th worldwide (top 0.6%) in Meta HackerCup 2023 Scoreboard: https://www.facebook.com/codingcompetitions/hacker-cup/2023/round-3/scoreboard	Nov 2023

CCPC is short for International Collegiate Programming Contest.
CCPC is short for Chinese Collegiate Programming Contest.

155th worldwide (top 0.5%) in Google CodeJam 2022	Jun 2022
2nd Place nationwide in “Leetcode Cup” National Programming Contest	Oct 2019

CODING COMPETITIONS - UNIVERSITY PROGRAMMING COMPETITIONS

2nd place in Princeton Computer Science Contest 2024 Member of team 91. See https://princetonacm.github.io/coscon2024/ for details.	Dec 2024
7th place worldwide in Codesprint LA Contest held by UCLA See https://codesprintla.uclaacm.com/ for details.	May 2024
Finalist (Top 16 in the U.S.) of MIT Informatics Tournament Spring Invitational Only top 16 contestants across the USA advance to the final. See https://codeforces.com/blog/entry/129342 for details.	May 2024
1st place in Princeton Competitive Programming Club Spring Special Contest See https://competitive-programming.cs.princeton.edu/hello_spring_24 for details.	Feb 2024
1st place in Princeton Computer Science Contest 2023 Member of team “temp name”. See https://princetonacm.github.io/coscon/ for details.	Dec 2023

HACKATHONS

Winner of IC3 Blockchain Summer Camp Hackathon Member of project “Client Security”. Event Website: https://www.initc3.org/events/2022-08-01-ic3-blockchain-camp-2022	Aug 2022
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COMPETITIONS IN OTHER SUBJECTS

First Prize in China Collegiate Mathematical Contest	Dec 2020
Second Prize in China Mathematics Olympiad (Anhui Site)	Sep 2016, 2017, 2018
Third Prize in China Physics Olympiad (Anhui Site)	Sep 2016

EXAMS

22th place (out of ~513,000) in the National College Entrance Exam in Anhui Province	Jun 2019
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RESEARCH EXPERIENCE AND PROJECTS

Research Project, Princeton University and Sentient <i>Advisor: Prof. Pramod Viswanath</i> <ul style="list-style-type: none"> Worked on establishing a decentralized, open, and transparent platform for AI development, enabling the community to contribute, monetize, and take ownership of AI models. Integrate AI copyright with cryptography, which contributes a new area AI-native cryptography. By decentralizing control and ensuring transparency through blockchain technology, OML prevents the concentration of power and provides accountability in AI development that has not been possible before. First author of the paper: OML: Open, Monetizable, and Loyal AI models. It is also the whitepaper of Sentient. The paper is live on Arxiv in November 2024. 	Feb 2024 - Nov 2024
Course Project, Princeton University <i>Instructor: Prof. Pramod Viswanath</i> <ul style="list-style-type: none"> Worked on SCTest: AI-assisted Unit test generation for smart contracts written in Solidity along with Jianzhu Yao, Mahsa Bastankhah, and Constantine Dumanidis. Presented on Princeton Decenter Spring Conference 2024. 	Feb 2024 - Apr 2024
Undergraduate Diploma Thesis, Tsinghua University <i>Advisor: Prof. Zhixuan Fang</i> <ul style="list-style-type: none"> Worked on designing a decentralized platform on top of blockchains for fair and transparent AI service, mainly exploring how to leverage techniques in cryptography (zero-knowledge proof) to deliver trust in the platform, namely “Proof-of-Inference” (PoI). Wins the “Excellent Diploma Thesis Award” of Tsinghua University (only 5 out of 94 in Yao Class). 	Feb 2023 - Jun 2023

- As part of the “SAKSHI” project, collaborated with a set of perfect talents from across the world, and co-authored the whitepaper “SAKSHI: Decentralized AI Platforms” for the project (live on ArXiv in July 2023).

Research Intern, University of California, Berkeley | *Advisor: Prof. Dawn Song* Jan 2022 - Aug 2022

- Mentored by Dawn’s Ph.D. student Tiancheng Xie (CTO of Polyhedra).
- Worked on cross-chain bridge protocol design and implementation with zero-knowledge proofs.
- Collaborated with a set of fantastic people from both industry and academia, and learned quite a lot.
- Co-authored the paper “zkBridge: Trustless Cross-chain Bridges Made Practical” (published in ACM CCS 2022).

Research Intern, Duke University | *Advisor: Prof. Fan Zhang* Jan 2022 - Aug 2022

- Worked on designing, analyzing, and simulating side contracts against EIP-1559 protocol on Ethereum.
- Used C++, Python to interact with an Ethereum full node, do data analysis, and simulate the protocol.

Student Research Training Program, Tsinghua University | *Advisor: Prof. Zhixuan Fang* Sep 2021 - Feb 2022

- Worked on mechanism design and implementation of a new protocol aimed at re-utilizing computation power for general and useful computation in PoW blockchains.
- Collaborated with Canhui, Ph.D. student in Prof. Fang’s group, and Shutong, one of my best friends during my undergraduate, on both protocol design and prototype implementation.
- The paper “Crowdsourcing Work as Mining: A Decentralized Computation and Storage Paradigm”, of which I am the co-first author, is published in APNET 2023.

Research Intern, Shanghai Qizhi Institute | *Advisor: Prof. Zhixuan Fang* Jul 2021 - Aug 2021

- Worked on modeling and mathematical analysis (using queueing theory) of blockchain transaction waiting time.

Student Research Training Program, Tsinghua University | *Advisor: Prof. Zhixuan Fang* Oct 2020 - Jun 2021

- Worked on analysis of multi-agent selfish mining on Bitcoin in both theory and simulation.
- The results were presented at IC3 Blockchain Summer Camp in 2022.

SOCIAL WORK AND ACTIVITIES

Participant of TV program “Super Brain” broadcast at Jiangsu Channel Jan 2023

Only Top 50 across China can appear at the final stage.

President, Yao Class Students’ Congress, Tsinghua University Oct 2022 - Jun 2023

Organized regular social activities for Yao Class students.

Connected students with leading tech companies and investment companies.

Took responsibility for managing the money and accounts of Yao Class Students’ Congress.

Held the yearly Students’ Congress work report to all students, and led the yearly new member recruitment.

Deputy Secretary, Yao Class Youth League, Tsinghua University Oct 2021 - Sep 2022

Attended bi-weekly meetings hosted by Tsinghua University, and delivered announcements from university to students.

Also did a lot of statistical work and paperwork for Yao Class students.

Vice President, Yao Class Students’ Congress, Tsinghua University Oct 2021 - Sep 2022

Took responsibility for departmental public space management (noise control, access control, regular cleaning, etc.)

Volunteer of the 110th Anniversary of Tsinghua University Apr 2021

Member, Organization and Activities Department, Yao Class Students Congress Aug 2020 - Sep 2021

PROFESSIONAL SERVICES

Reviewer of IEEE Journal on Selected Areas in Communications May 2022

Provide thorough and detailed reviews for 2 papers submitted to the Special Issue of IEEE JSAC: Intelligent Blockchain for Future Communications and Networking: Technologies, Trends and Applications.

Student Expert and Problem Setter, National Olympiad in Informatics of China (NOI 2021) Jul 2021

Set the first problem in Day 2’s contest (out of a total of 6 problems across 2 days).

Received positive feedback from contestants.

Voted as the best problem in the entire contest from the post-contest survey.

Member, Tsinghua University Algorithm Association Jul 2020 - Feb 2022

Problem setter and contest organizer of Tsinghua University Programming Contest (THUPC) in 2020 and 2021.

Head TA, Princeton COS/ECE 470 Principles of Blockchains

Sep 2024 - Jan 2025

Provide both weekly and on-demand office hours to around 80 students of the course.

Guide students to Rust programming and distributed system building hand-by-hand.

Lead 3 in-class labs for hands-on activities on interesting topics of blockchains.

Coordinator of the grading process and task splitting among the course team.

Completely re-designed the course final project which aims to use crowdsourcing to collect blockchain data and train an AI agent with the collected data, so that the course keeps staying at the frontier of technology innovation which combines blockchains and AI. This renovation received very positive feedback from students.

Mentor, Olympiad in Informatics Private Summer Camp for Talented Students July 2019, 2020, 2021

Provided both online and in-person lectures and corresponding exercises on advanced olympiad-level data structure and algorithms to a class of around 20 selected high-school talents, aiming at gold medals in NOI contests.

Received very positive feedback from students.

SKILLS**Spoken Languages:**

Chinese/Mandarin (native), English (111pts in TOEFL iBT, R30 L27 S24 W30)

Programming Languages:

Most Proficient: C/C++ Frequently Used: Python

Also familiar with: Golang, Matlab, Solidity, SQL, Verilog