

Mingzhe Li

Assistant Professor
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Research Interests

My research interests span the broad domain of blockchain systems and Web 3.0, with a particular focus on **blockchain interoperability**, **sharding**, **security**, and **intelligent blockchain systems**. I am especially interested in designing scalable and efficient blockchain protocols, leveraging AI-driven techniques to enhance security and performance, and exploring decentralized finance (DeFi) and network economics. My work aims to address fundamental challenges in blockchain scalability, security, and usability by developing innovative and practically deployable solutions that push the boundaries of blockchain technology for real-world applications.

Employment

- Jan. 2026 – Present ◇ **Assistant Professor**, School of Computing and Information Technology (SCIT), Great Bay University, Dongguan, China.
- Nov. 2025 – Present ◇ **Invited Instructor**, Centre in Computational Technologies for Finance, Nanyang Technological University, Singapore.
- Sept. 2022 – Oct. 2025 ◇ **Research Scientist**, Institute of High Performance Computing (IHPC), Agency for Science, Technology and Research (A*STAR), Singapore.
▷ **Champion** (team leader) of the department's blockchain team.
- Nov. 2024 – May. 2025 ◇ **Mentor** in Blockchain Capstone Project, Centre in Computational Technologies for Finance, Nanyang Technological University, Singapore.
- Nov. 2024 – Feb. 2025 ◇ **Invited Instructor**, Centre in Computational Technologies for Finance, Nanyang Technological University, Singapore.
- Nov. 2023 – May. 2024 ◇ **Mentor** in Blockchain Capstone Project, Centre in Computational Technologies for Finance, Nanyang Technological University, Singapore.
- Nov. 2023 – Feb. 2024 ◇ **Invited Instructor**, Centre in Computational Technologies for Finance, Nanyang Technological University, Singapore.
- Jan. 2018 – Jan. 2020 ◇ **Teaching Assistant**, Department of Computer Science and Engineering, Southern University of Science and Technology, Shenzhen, China.

Education

- 2016 – 2022 ◇ **Ph.D.** in Computer Science and Engineering,
Hong Kong University of Science and Technology (HKUST), Hong Kong, China.
▷ *Advisors:* Prof. Wei Wang and Prof. Jin Zhang.
▷ *Dissertation:* "Towards Efficient and Secure Sharding-Based Blockchain".
▷ **Selected PhD Graduates.**
- 2012 – 2016 ◇ **B.E.** in Communication Engineering,
Southern University of Science and Technology (SUSTech), Shenzhen, China.
▷ *Advisor:* Prof. Jin Zhang.
▷ *Core GPA:* 3.91/4.0.
▷ *Major Rank:* Top 1.
▷ **Outstanding Graduates.**

Publications

*: Equal Contribution, Names: (Co-)Supervised Students.

Published

1. Chaoyue Yin*, **Mingzhe Li***, Jin Zhang, You Lin, Qingsong Wei, and Siow Mong Rick Goh. "Atomic Smart Contract Interoperability with High Efficiency via Cross-Chain Integrated Execution". *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, 2025.
2. You Lin*, **Mingzhe Li***, and Jin Zhang. "SpiralShard: Highly Concurrent and Secure Blockchain Sharding via Linked Cross-shard Endorsement". *IEEE/ACM Transactions on Networking (TON)*, 2025.
3. **Mingzhe Li**, You Lin, Jin Zhang, and Wei Wang. "SP-Chain: Boosting Intra-Shard and Cross-Shard Security and Performance in Blockchain Sharding". *IEEE Internet of Things Journal (IoTJ)*, 2025.
4. **Mingzhe Li**, Jin Zhang, and Wei Wang. "Towards Efficient and Deposit-Free Blockchain-Based Spatial Crowdsourcing". *ACM Transactions on Sensor Networks (TOSN)*, 2024.
5. **Mingzhe Li**, Jin Zhang, and Wei Wang. "LB-Chain: Load-Balanced and Low-Latency Blockchain Sharding via Account Migration". *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, 2023.
6. **Mingzhe Li**, You Lin, Jin Zhang, and Wei Wang. "CoChain: High Concurrency Blockchain Sharding via Consensus on Consensus". *IEEE International Conference on Computer Communications (INFOCOM)*, 2023 (19.2% acceptance rate).
7. **Mingzhe Li**, You Lin, Jin Zhang, and Wei Wang. "Jenga: Orchestrating Smart Contracts in Sharding-Based Blockchain for Efficient Processing". *42nd IEEE International Conference on Distributed Computing Systems (ICDCS)*, 2022 (19.9% acceptance rate).
8. **Mingzhe Li**, Jin Zhang, Wei Wang, and Qian Zhang. "Incentivizing WiFi-based Multilateration Location Verification". *IEEE Internet of Things Journal (IoTJ)*, 2021.
9. **Mingzhe Li**, Jingrou Wu, Jin Zhang, and Wei Wang. "Towards Privacy-Preserving Task Assignment for Fully Distributed Spatial Crowdsourcing". *IEEE Internet of Things Journal (IoTJ)*, 2021.
10. **Mingzhe Li**, Jin Zhang, and Wei Wang. "Task Selection and Scheduling for Food Delivery: A Game-Theoretic Approach". *IEEE Global Communications Conference (GLOBECOM)*, 2018.
11. **Mingzhe Li**, Yue Zhang, Zidong Han, and Yi Gong. "Measurement of Respiration Frequency in Ultra-Wide Band Radar System". *Big Data technology and applications*, 2015.

In Submission

1. Kentaroh Toyoda, Xiao Wang, **Mingzhe Li**, Bo Gao, Yuan Wang, and Qingsong Wei. "Blockchain Data Analysis in the Era of Large-Language Models". arXiv preprint arXiv:2412.09640v1, 2024.
2. **Mingzhe Li**, Bo Gao, Kentaroh Toyoda, Yechao Yang, Juniarto Samsudin, Haibin Zhang, Sifei Lu, Tai Hou Ting, Kerching Choo, Andy Ting, Siow Mong Rick Goh, and Qingsong Wei. "MStableChain: Towards Multi-Native Stablecoins in EVM-Compatible Blockchain for Stable Fee and Mass Adoption". arXiv preprint arXiv:2410.22100, 2024.
3. Hulin Yang*, **Mingzhe Li***, Jin Zhang, Alia Asheralieva, Qingsong Wei, and Siow Mong Rick Goh. "BriDe Arbitrager: Enhancing Arbitrage in Ethereum 2.0 via Bribery-enabled Delayed Block Production". arXiv preprint arXiv:2407.08537, 2024.
4. **Mingzhe Li***, **You Lin***, and Jin Zhang. "StableShard: Stable and Scalable Blockchain Sharding with High Concurrency via Collaborative Committees". arXiv preprint arXiv:2407.06882v2, 2024.

Projects and Grants

1. Project Member. Development of Decentralized High Performance GPU Computing Network. 1,079,924 SGD (Cash + Funding + In-Kind). Oct. 2024 – Sept. 2025.
 - ▷ Assisted the project in developing a scalable decentralized high performance GPU computing network infrastructure for AI and Web3 applications.
 - ▷ Personal contribution accounted for 10% of the overall project.
2. Project Member. Research and Development of Mesh Gold. 510,000 SGD (Cash + Funding + In-Kind). Oct. 2023 – Oct. 2024.
 - ▷ Assisted the blockchain project's technical team in designing and developing the consensus protocol.
 - ▷ Personal contribution accounted for 20% of the overall project.
3. **Lead PI**. Development of Layer One Blockchain. **1,541,370 SGD** (Cash + In-Kind). Mar. 2023 – Mar. 2024.
 - ▷ Led a team of **over 10 members** in the development of a next-generation Layer 1 blockchain protocol.
 - ▷ With our support, the blockchain successfully **launched its mainnet**: Hela in 2024 and has been running stably since then.
 - ▷ Transformed the project's outcomes into an **academic paper as the first author**: "MStableChain: Towards Multi-Native Stablecoins in EVM-Compatible Blockchain for Stable Fee and Mass Adoption", which is currently under submission.
4. Project Member. Guangdong Provincial Key Laboratory of Brain-inspired Intelligent Computation, Guangdong Provincial Key Laboratory (Grant No. 2020B121201001), 3,000,000 RMB, Feb. 2020 – July 2022.
 - ▷ Conducted research on load balancing in blockchain sharding.
 - ▷ Published an academic paper as the first author: "LB-Chain: Load-Balanced and Low-Latency Blockchain Sharding via Account Migration".
5. Project Member. Intelligent Analysis Techniques on Gastrointestinal Mucosal Lesions, Shenzhen Science, Technology and Innovation Commission Discipline Planning Project (Grant No. JCYJ 20180507181527806), 2,000,000 RMB, Mar. 2019 – Mar. 2022.
 - ▷ Conducted research on efficient smart contract execution in blockchain sharding.
 - ▷ Published an academic paper as the first author: "Jenga: Orchestrating Smart Contracts in Sharding-Based Blockchain for Efficient Processing".
6. Project Member. Hong Kong RGC GRF Grant 16202121. High Concurrency Blockchain Sharding. Aug. 2021 – Jan. 2022.

- ▷ Conducted research on highly concurrent and secure blockchain sharding.
 - ▷ Published an academic paper as the first author: "CoChain: High Concurrency Blockchain Sharding via Consensus on Consensus".
7. Project Member. National Natural Science Foundation for Young Scientist of China (Grant No. 61173156), 265,000 RMB, Jan. 2018 – Dec. 2020.
 - ▷ Conducted research on incentive mechanisms in location verification services.
 - ▷ Published an academic paper as the first author: "Incentivizing WiFi-based Multilateration Location Verification".
 8. Project Member, Team Leader for Developing IOS Software. Hong Kong Smart City Development. Sept. 2016 – Sept. 2019.
 - ▷ Developed an iOS application for the Hong Kong Smart City project.
 9. Project Member. SUSTech Smart Sensing and Virtual Reality Maker Service Platform, Shenzhen Science, Technology and Innovation Commission Maker Service Platform Project (Grant No. CKPT 20160831115457987), 2,000,000 RMB, Sept. 2016 – Aug. 2018.
 - ▷ Conducted research on privacy-preserving and secure task allocation mechanisms in decentralized crowdsourcing systems.
 - ▷ Published two academic papers as the first author: "Towards Privacy-Preserving Task Assignment for Fully Distributed Spatial Crowdsourcing", and "Towards Efficient and Deposit-Free Blockchain-Based Spatial Crowdsourcing".
 10. Project Member. Task Allocation and Incentive Mechanism for Mobile Crowdsourcing System, Shenzhen Science, Technology and Innovation Commission Basic Research Project (Grant No. JCYJ 20160531190935987), 300,000 RMB, July 2016 – June 2018.
 - ▷ Conducted research on task allocation in food delivery crowdsourcing.
 - ▷ Published an academic paper as the first author: "Task Selection and Scheduling for Food Delivery: A Game-Theoretic Approach".

Patents

1. **Mingzhe Li**, and Jin Zhang. Blockchain Sharding Method and Blockchain System Based on Account Migration. CN Patent 202310292501, 2025.
2. **Mingzhe Li**, Changchao Sun, and Jin Zhang. Spacial Crowdsourcing Task Assignment Method, Device, Equipment and Storage Medium. CN Patent 201910411282, 2022.
3. **Mingzhe Li**, Jingrou Wu, Jin Zhang, and Wei Wang. Spacial Crowdsourcing Task Assignment Method and System. CN Patent 201811424597, 2021.
4. **Mingzhe Li**, You Lin, Jin Zhang, and Wei Wang. Efficient and Secure Intra-Shard Consensus and Cross-Shard Transaction Processing Scheme. CN Patent, 2022. Patent Pending
5. **Mingzhe Li**, You Lin, Jin Zhang, and Wei Wang. Blockchain Sharding System for Efficient Smart Contract Processing. CN Patent, 2022. Patent Pending
6. **Mingzhe Li**, You Lin, Jin Zhang, and Wei Wang. Highly Concurrent and Recoverable Blockchain Sharding System. CN Patent, 2022. Patent Pending

Presentations and Talks

Invited Talks

1. "Orchestration between Blockchain and AI", Singapore University of Technology and Design, Nov. 2024.
2. "Towards Highly Concurrent and Secure Blockchain", Singapore University of Technology and Design, Nov. 2023.
3. "Towards Highly Concurrent and Secure Blockchain", NTU-CCTF and A*STAR IHPC Blockchain Workshop, Aug. 2023.
4. "Blockchain and Healthcare: An Introduction", Shenzhen Second People's Hospital, Oct. 2022.
5. "Towards Efficient and Secure Blockchain: Solutions and Future Directions", Shandong Technology and Business University, Oct. 2022.
6. "Efficiency and Security of Blockchain Sharding: Problems and Methods", OPPO, May 2022.

Paper Presentations

1. "CoChain: High Concurrency Blockchain Sharding via Consensus on Consensus", IEEE International Conference on Computer Communications (INFOCOM), May 2023.
2. "Jenga: Orchestrating Smart Contracts in Sharding-Based Blockchain for Efficient Processing", 42nd IEEE International Conference on Distributed Computing Systems (ICDCS), July 2022.
3. "Task Selection and Scheduling for Food Delivery: A Game-Theoretic Approach", IEEE Global Communications Conference, Dec. 2018.

Teaching Experience

Master Course

- **SC6108: Blockchain and Smart Contract Security**, NTU External Instructor, Master of Science in Blockchain, Centre in Computational Technologies for Finance, Nanyang Technological University, Winter 2024.
 - ▷ Invited as the sole *external instructor* to co-teach with Prof. Yi Li and Prof. Tianwei Zhang from NTU.
 - ▷ The course was attended by *over 60 master students* from Nanyang Technological University.
 - ▷ Taught students about security issues in decentralized finance and engaged in discussions on cutting-edge academic papers.
 - ▷ Received *highly positive feedback* from students.
- **SC6108: Blockchain and Smart Contract Security**, NTU External Instructor, Master of Science in Blockchain, Centre in Computational Technologies for Finance, Nanyang Technological University, Winter 2023.
 - ▷ Invited as the sole *external instructor* to co-teach with Prof. Yi Li and Prof. Tianwei Zhang from NTU.
 - ▷ The course was attended by *over 50 master students* from Nanyang Technological University.
 - ▷ Taught students about security issues in decentralized finance and engaged in discussions on cutting-edge academic papers.
 - ▷ Received *highly positive feedback* from students.

Undergraduate Course

- **CS202: Computer Organization**, TA Duty, Fall 2019.

- **CS305: Computer Networks**, TA Duty, Spring 2019.
- **CS202: Computer Organization**, TA Duty, Fall 2018.
- **CS305: Computer Networks**, TA Duty, Spring 2018.

Mentorship

PhD Students (Current)

- Zhao Zhao. (Co-supervising with Prof. Jin Zhang from Southern University of Science and Technology), 2025 – Present.
- Hulin Yang. (Co-supervising with Prof. Jin Zhang from Southern University of Science and Technology), 2024 – Present.

Master Students (Current)

- Chaoyue Yin, Yuyang Peng. (Co-supervising with Prof. Jin Zhang from Southern University of Science and Technology), 2024 – Present.

Master Students (Past)

- Jianzhang Li, Fanhui Yao, Ting Yang, Han Gao. (NTU CCTF Blockchain Capstone Project, 2024), 2024 – 2025.
- You Lin. (Co-supervised with Prof. Jin Zhang from Southern University of Science and Technology), 2022 – 2024.
- Hexiang Qi, Renjian Lin, Sicong Wang, Jiaxiang Zou. (NTU CCTF Blockchain Capstone Project, 2023), 2023 – 2024.

Honors and Awards

- **Selected for the National-level Talent Recruitment Program “Qiming Program” (Youth Track)**, Ministry of Industry and Information Technology (MIIT), China, Nov. 2025.
- **Winner of National Singapore Blockchain Innovation Challenge**, “Blockchain-based Federated Learning Platform”, Singapore, May 2024.
- **Selected PhD Graduates**, from HKUST CSE Department, Dec. 2022.
- **Outstanding Graduates**, from Southern University of Science and Technology, July 2016.

Community Involvement

Reviewer

- International World Wide Web Conference 2025.
- IEEE Transactions on Parallel and Distributed Systems.
- Journal of Parallel and Distributed Computing.
- IEEE Transactions on Services Computing.
- IEEE Transactions on Information Forensics and Security.
- IEEE Transactions on Computers.

- IEEE Internet of Things Journal.
- Cluster Computing.

Organization of Events

- **Co-organizer**, IEEE Conference on Artificial Intelligence Workshop (Blockchain and Artificial Intelligence), 2024.

Skills

Programming	◇ GoLang, Rust, Python, MATLAB, C++, Swift
Document Creation	◇ Microsoft Office Suite, LaTeX, Markdown
Languages	◇ Mandarin (native), English (fluent)