

ZHIXUAN FANG

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Institute for Interdisciplinary Information Sciences

Tsinghua University

PROFESSIONAL EXPERIENCE

Assistant Professor Sep 2020 - Present
Institute for Interdisciplinary Information Sciences (IIIS), Tsinghua University

Postdoctoral Researcher Aug 2018 - Aug 2020
Department of Information Engineering, The Chinese University of Hong Kong
Advisor: Prof. Jianwei Huang
(Joint supervision with Prof. Biying Shou
at Department of Management, City University of Hong Kong since Feb 2020.)

EDUCATION

PhD degree in computer science, Tsinghua University Jul 2018
In Institute for Interdisciplinary Information Sciences (IIIS), Tsinghua University, China.
Thesis: Strategies and Optimization in the Sharing Economy
Advisors: Prof. Andrew Chi-Chih Yao and Prof. Longbo Huang

Visiting PhD student, University of California, Berkeley Aug 2016 - Dec 2016
Hosted by Prof. Jean Walrand at EECS.

B.S. degree, Peking University Jul 2013
School of Physics, Peking University, China.

RESEARCH INTERESTS

My research focuses on developing methods and solutions to address challenges in social/multi-agent systems consist of interest-driven individuals. Typically, I model and analyze the systems through the lens of mechanism design, mathematics optimization, economics, and algorithms.

My recent studies are mostly on the design and analysis of *blockchain systems* and *online platforms*.

PUBLICATIONS

• Journal Publications (* denotes corresponding author)

- (J1) Canhui Chen, Xu Chen, and Zhixuan Fang*, "TIPS: Transaction Inclusion Protocol with Signaling in DAG-Based Blockchain," IEEE Journal on Selected Areas in Communications (JSAC), to appear.
- (J2) Yunshu Liu, Shulin Ke, Zhixuan Fang, Man Hon Cheung, Wei Cai, and Jianwei Huang, "A Storage Sustainability Mechanism with Heterogeneous Miners in Blockchain," IEEE Journal on Selected Areas in Communications (JSAC), to appear.
- (J3) Yunshu Liu, Zhixuan Fang, Man Hon Cheung, Wei Cai, and Jianwei Huang, "An Incentive Mechanism for Sustainable Blockchain Storage" IEEE/ACM Transactions on Networking (ToN), 2022.
- (J4) Qingsong Liu, Wenfei Wu, Longbo Huang, and Zhixuan Fang*, "Simultaneously Achieving Sub-linear Regret and Constraint Violations for Online Convex Optimization with Time-varying Constraints," Elsevier's Performance Evaluation (PEVA), volume 152, 2021. [Accepted directly through IFIP Performance 2021]

- (J5) Ningning Ding, Zhixuan Fang, Lingjie Duan, and Jianwei Huang, "Optimal Incentive and Load Design for Distributed Coded Machine Learning," *IEEE Journal on Selected Areas in Communications (JSAC)*, volume 39, issue 7, 2021.
- (J6) Ningning Ding, Zhixuan Fang, and Jianwei Huang, "Optimal Contract Design for Efficient Federated Learning With Multi-Dimensional Private Information," *IEEE Journal on Selected Areas in Communications (JSAC)*, volume 39, issue 1, 2021.
- (J7) Zhixuan Fang*, Longbo Huang, and Adam Wierman, "Loyalty programs in the sharing economy: Optimality and competition," *Elsevier's Performance Evaluation (PEVA)*, volume 143, 2020.
- (J8) Zhixuan Fang*, Longbo Huang, and Adam Wierman, "Prices and Subsidies in the Sharing Economy," *Elsevier's Performance Evaluation (PEVA)*, volume 136, 2019.

• **Conference Publications**

- (C1) Jiayuan Liu, Canhui Chen, Lulu Zhou, and Zhixuan Fang, "Real-Time Recursive Routing in Payment Channel Network: A Bidding-based Design," *Proceedings of the 20th International Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks (WiOpt)*, September 2022.
- (C2) Qingsong Liu, Zhuoran Li, and Zhixuan Fang, "Online Convex Optimization with Switching Costs: Algorithms and Performance," *Proceedings of the 20th International Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks (WiOpt)*, September 2022.
- (C3) Hongbo Zhang, Sizheng Fan, Zhixuan Fang, and Wei Cai, "Economic Analysis of Decentralized Exchange Market with Transaction Fee Mining", In *2022 ACM International Symposium on Blockchain and Secure Critical Infrastructure (BSCI)*, May 2022. (**Best Paper Award**)
- (C4) Yihan Du, Siwei Wang, Zhixuan Fang, and Longbo Huang, "Continuous Mean-Covariance Bandits," *Proceedings of the 35th Conference on Neural Information Processing Systems (NeurIPS)*, December 2021.
- (C5) Qingsong Liu, Wenfei Wu, Longbo Huang, and Zhixuan Fang, "Simultaneously Achieving Sub-linear Regret and Constraint Violations for Online Convex Optimization with Time-varying Constraints," *Proceedings of the 39th International Symposium on Computer Performance, Modeling, Measurements and Evaluation (Performance)*, November 2021.
- (C6) Ningning Ding, Zhixuan Fang, Lingjie Duan, and Jianwei Huang, "Incentive Mechanism Design for Distributed Coded Machine Learning," *Proceedings of IEEE International Conference on Computer Communications (INFOCOM)*, May 2021.
- (C7) Ningning Ding, Zhixuan Fang and Jianwei Huang, "Information Disclosure Game on Sharing Platforms," *Proceedings of The 2020 IEEE Global Communications Conference (GLOBECOM)*, December 2020.
- (C8) Zhixuan Fang and Jianwei Huang, "When Reputation Meets Subsidy: How to Build High Quality On Demand Service Platforms," *Proceedings of IEEE International Conference on Computer Communications (INFOCOM)*, July 2020.
- (C9) Ningning Ding, Zhixuan Fang and Jianwei Huang, "Incentive Mechanism Design for Federated Learning with Multi-Dimensional Private Information," *Proceedings of the 18th International Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks (WiOpt)*, June 2020.
- (C10) Yunshu Liu, Zhixuan Fang, Man Hon Cheung, Wei Cai and Jianwei Huang, "Economics of Blockchain Storage," *Proceedings of IEEE International Conference on Communications (ICC)*, June 2020.

- (C11) Ling Pan, Qingpeng Cai, Zhixuan Fang, Pingzhong Tang and Longbo Huang, “A Deep Reinforcement Learning Framework for Rebalancing Dockless Bike Sharing Systems,” Proceedings of the Thirty-Third AAAI Conference on Artificial Intelligence (AAAI), February 2019.
- (C12) Zhize Li, Le Zhang, Zhixuan Fang and Jian Li, “A Two-Stage Mechanism for Ordinal Peer Assessment,” Proceedings of the the 11th International Symposium on Algorithmic Game Theory (SAGT), September 2018.
- (C13) Zhixuan Fang, Longbo Huang and Adam Wierman, “Loyalty Programs in the Sharing Economy: Optimality and Competition,” Proceedings of the 19th ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc), June 2018.
- (C14) Zhixuan Fang, Longbo Huang and Adam Wierman, “Prices and Subsidies in the Sharing Economy,” Proceedings of the International Conference on World Wide Web (WWW), April 2017.
- (C15) Zhixuan Fang and Longbo Huang, “Market Share Analysis with Brand Effect,” Proceedings of IEEE Conference on Decision and Control (CDC), December 2016.
- (C16) Zhixuan Fang and Longbo Huang, “Market Share Analysis with Brand Effect,” Proceedings of the International Conference on Autonomous Agents and Multiagent Systems (AAMAS)(Extended abstract), May 2016.

PROFESSIONAL SERVICES

Organizing Committee Member

- 2022 Publicity Co-Chair: ACM MobiHoc
- 2021 Local Arrangement Co-Chair & Web Chair: ACM Sigmetrics
- 2021 Publicity Co-Chair: WiOpt
- 2020 Web Chair: WiOpt

Technical Program Committee (TPC) Member

- 2022 ICDCS
- 2022 AAMAS
- 2022 AAAI
- 2021 WiOpt
- 2021 AAMAS
- 2021 AAAI
- 2021 ITC-33
- 2020 AAAI
- 2019 EAI GameNets

Technical Reviewer

- IEEE Journal on Selected Areas in Communications (JSAC)
- IEEE/ACM Transactions on Networking (TON)
- IEEE Transactions on Mobile Computing (TMC)
- IEEE Transactions on Communications (TCOM)
- IEEE Transactions on Network Science and Engineering (TNSE)
- IEEE Transactions on Vehicular Technology (TVT)
- IEEE Transactions on Smart Grid (TSG)
- IEEE MultiMedia (MM)
- Journal of Systems Science and Systems Engineering (JSSSE)
- IEEE Conference on Decision and Control (CDC)