Zishuo Zhao 赵梓硕

zishuoz2@illinois.edu, wiku30@mit.edu

ISE, University of Illinois Urbana-Champaign

1   Background

- **2023/09 - 2024/08** Visiting Student, Institute for Data Systems and Society (IDSS), Massachusetts Institute of Technology
  Advisor: David Simchi-Levi

- **2021/01 - now** PhD student, Department of Industrial & Enterprise Systems Engineering, University of Illinois Urbana-Champaign
  Research Area: Operations Research
  Advisor: Yuan Zhou
  Expected Graduation: Summer 2025
  Tentative Thesis Title: *Reliable and Sustainable Design for Digital Economic Platforms*

- **2020/08 - 2021/01** Research Assistant, Haihua Institute for Frontier Information Technology

- **2016/05 - 2020/07** Undergraduate student, Institute for Interdisciplinary Information Sciences (Yao Class), Tsinghua University

- **2015/08 - 2016/05** Undergraduate student, Department of Computer Science and Technology, Tsinghua University

2   Research Interests

I am a fourth-year PhD student in UIUC, majoring in operations research, and currently doing research in mechanism design. In general, my research interests span a wide scope related to incentive-aware design and optimization for emerging applications in digital economy, including blockchain systems, e-commerce, ridesharing platforms and so on. I am also interested in data-driven mechanism design based on statistical/online learning, and topics in cryptography and distributed systems with applications in blockchain.

On a very high level, my (starry-eyed) dream for research lies in the following fields, which are also the topics I am most actively working on:

- **AI for mechanism design** [#A4M]: e.g., using data-driven methods to improve the performance of economic platforms.

- **Mechanism design for AI** [#M4A]: e.g., using economic incentives to reinforce the efficiency and security of AI systems.

- **Sustainability in AI & Economy** [#SUS]: e.g. using interdisciplinary methodologies to foster long-term social welfare and environmental friendliness for new-era AI and economic platforms.

Additionally, I was interested in geometry-based computer graphics and vision at my undergraduate times. Although I no longer focus on that research field, I am still happy to discuss about related topics, especially the recently fruitful field of embodied AI [#EAI].

3 Research

3.1 Publications

Personalized Pricing with Group Fairness Constraint [#A4M] [#SUS] [Link]

Xin Chen*, Zexing Xu*, Zishuo Zhao*, Yuan Zhou*. (alphabetical order)

ACM Conference on Fairness, Accountability, and Transparency (ACM FAccT 2023)

Bayesian Mechanism Design for Blockchain Transaction Fee Allocation[1] [#M4A] [Link]

Xi Chen*, David Simchi-Levi*, Zishuo Zhao*, Yuan Zhou*. (alphabetical order)

Best Paper Award, *NeurIPS Workshop on Decentralization and Trustworthy Machine Learning in Web3, 2022.*

Crypto Economics Security Conference (CESC 2022).

Invited to *INFORMS Annual Meeting 2022.*

Dynamic Car Dispatching and Pricing: Revenue and Fairness for Ridesharing Platforms [#A4M] [#SUS] [Link]

Zishuo Zhao, Xi Chen, Xuefeng Zhang, Yuan Zhou

International Joint Conference on Artificial Intelligence (IJCAI 2022), **Long Oral (3.75%)**.

Invited to *INFORMS Annual Meeting 2021.*

ClusterSLAM: A SLAM Backend for Simultaneous Rigid Body Clustering and Motion Estimation [#EAI] [Link]

Jiahui Huang, Sheng Yang, Zishuo Zhao, Yukun Lai, Shi-Min Hu.

International Conference on Computer Vision (ICCV 2019).

---

[1]A preliminary version of this research has the title "Bayesian-Nash-Incentive-Compatible Mechanism for Blockchain Transaction Fee Allocation"

3.2 Working Projects

Proof-of-Learning with Incentive Security [#M4A] [#SUS]

Zishuo Zhao, Zhixuan Fang, Xuechao Wang, Yuan Zhou

Presented on INFORMS Annual Meeting 2023.

Incentive-Aware Dynamic Auction for Budgeted Bidders [#A4M]

David Simchi-Levi*, Zishuo Zhao*, Yuan Zhou*. (alphabetical order)

Peer Prediction for Verifier's Dilemma [#M4A]

(Collaborators TBA)

4 Academic Activities

- Invited to OR Talk by 运筹OR帷幄 (OR China) in 2024.

- Facilitator in section Revenue & Pricing, INFORMS Annual Meeting, 2021.

- Invited to the Alumni Forum for the 10th Anniversary of IIIS, Tsinghua University in 2021.

5 Awards

5.1 Academic

- **Best Paper Award**, NeurIPS Workshop on Decentralization and Trustworthy Machine Learning in Web3, 2022

- Crypto Economics Security Conference (CESC) Travel Award, 2022

- UIUC Graduate College Conference Presentation Award, 2021

- 12th place in 2nd THUCTF Information Security Contest in Tsinghua University, 2020

- 12th place in 24th Artificial Intelligence Programming Contest in Tsinghua University, 2020

- Xuetang Scholarship in Tsinghua University, 2016-2020

- 15th place in 20th Artificial Intelligence Programming Contest in Tsinghua University, 2016.

- Second Prize in Chinese Mathematical Olympiad (CMO), 2014

- First Prize in National Olympiad in Informatics in Provinces (NOIP), 2013

5.2   Arts

- Finalist Award in the "一盏茶时 (*IIIS Tea Time*)" photography exhibition for the 12th Anniversary of IIIS, Tsinghua University, 2023.

- Scholarship for Arts Excellence in Tsinghua University, 2018.

- Third Prize in the Art Festival of No.1 Middle School affiliated to CCNU, 2013.

6   Miscellaneous

6.1   Languages

- Mandarin Chinese (native)

- English (fluent)

- Classical Chinese (writing as a hobby)

6.2   Extracurricular Activities

- I have an amateur interest in Capture-The-Flag (CTF) competitions, and developed two Reverse challenges in the TQLCTF 2022.

- I have a wide scope of hobbies in arts and aerobic sports, especially in vocal music, photography, piano, table tennis and orienteering. Particularly, my photographs "梦影(*Dreamland Impression*)" and "$2\pi i$" won the Finalist Award in the photography exhibition for the 12th Anniversary of IIIS, Tsinghua University in 2023.

6.3   Coding Skills

- Mainly using C++, MATLAB and Mathematica, also with command of Python, Java, PHP.

- With some knowledge in Verilog HDL and assembly language.

- Open to learn new programming languages when in need.

(Updated on Mar 16, 2024)