

JIAYUAN LIU

Computer Science Department, Carnegie Mellon University, Pittsburgh, USA

✉ jiayuan4@andrew.cmu.edu 🏠 liu-jiayuan.github.io

Education

Carnegie Mellon University

Aug 2023 – present

Ph.D. student in Computer Science, School of Computer Science

Pittsburgh, USA

- Member of [Foundations of Cooperative AI Lab](#)
- Advised by [Prof. Vincent Conitzer](#)

Research Interests: Large Language Model, AI Agents, Multi-agent System, Mechanism Design, Game Theory

Tsinghua University

Aug 2019 – June 2023

*Bachelor's in Computer Science and Technology at [Yao Class](#), *summa cum laude**

Beijing, China

- GPA: 3.99/4.00, Ranking: 1/94
- National Scholarship Winner, Outstanding Graduate of Tsinghua University

Publications and Manuscripts

- Jiayuan Liu, Shiyi Du, Weihua Du, Mingyu Guo, Vincent Conitzer, “The Consensus Trap: Rescuing Multi-Agent LLMs from Adversarial Majorities via Token-Level Collaboration,” Manuscript 2026 [\[pdf\]](#).
- Jiayuan Liu*, Tianqin Li*, Shiyi Du*, Xin Luo*, Haoxuan Zeng, Emanuel Tewolde, Tai Sing Lee, Tonghan Wang, Carl Kingsford, Vincent Conitzer, “The Memory Curse: How Expanded Recall Erodes Cooperative Intent in LLM Agents,” Manuscript 2026.
- Shiyi Du, Jiayuan Liu, Weihua Du, Yue Huang, Jiayi Li, Yingtao Luo, Xiangliang Zhang, Vincent Conitzer, Carl Kingsford, “Why Search When You Can Transfer? Amortized Agentic Workflow Design from Structural Priors,” Manuscript 2026.
- (α - β) Ratip Emin Berker, Vincent Conitzer, Eden Hartman, Jiayuan Liu, Caspar Oesterheld, “How Many Votes Is a Lie Worth? Measuring Strategyproofness through Resource Augmentation,” the eighth Games, Agents, and Incentives Workshop at AAMAS 2026 [\[pdf\]](#).
- Jiayuan Liu, Mingyu Guo, Jiarui Gan, Vincent Conitzer, “Truthful and Cost-Minimizing Model Routing in Graph-Based Agentic Workflows,” Manuscript 2025 [\[pdf\]](#).
- Jiayuan Liu, Barry Wang, Jiarui Gan, Tonghan Wang, Leon Xie, Mingyu Guo, Vincent Conitzer, “Incentive-Aware Multi-Fidelity Optimization for Generative Advertising in Large Language Models,” Manuscript 2025 [\[pdf\]](#).
- Long Phan, Alice Gatti, Ziwen Han, Nathaniel Li, Josephina Hu, Hugh Zhang, Chen Bo Calvin Zhang, et al., “Humanity’s Last Exam,” 2025 [\[pdf\]](#).
- Jiayuan Liu, Mingyu Guo, Vincent Conitzer, “An Interpretable Automated Mechanism Design Framework with Large Language Models,” Workshop on Information Economics and LLMs at the twenty-sixth ACM Conference on Economics and Computation (EC), July 2025 [\[pdf\]](#).
- Jiayuan Liu, Siwei Wang, Zhixuan Fang, “Policy Gradient Algorithm for Multi-armed Bandits Robust to Adversarial Corruptions,” the twenty-fourth International Conference on Autonomous Agents and Multiagent Systems (AAMAS), May 2025 [\[pdf\]](#).
- Mingyu Guo, Jiayuan Liu, Vincent Conitzer, “Extending Myerson’s Optimal Auctions to Correlated Bidders via Neural Network Interpolation,” the eighth International Conference on Algorithmic Decision Theory (ADT), October 2024 [\[pdf\]](#).
- Jiayuan Liu, Shuran Zheng, Yiling Chen, “Cost-Efficient Information Aggregation in Hierarchical Information Structure,” Manuscript 2023 [\[pdf\]](#).
- Heng Dong, Tonghan Wang, Jiayuan Liu, Chongjie Zhang, “Low-Rank Modular Reinforcement Learning via Muscle Synergy,” the thirty-sixth Conference on Neural Information Processing Systems (NeurIPS), November 2022 [\[pdf\]](#).
- Jiayuan Liu*, Canhui Chen*, Lulu Zhou, Zhixuan Fang, “Real-Time Recursive Routing in Payment Channel Network: A Bidding-based Design,” the twentieth International Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks (WiOpt), September 2022 [\[pdf\]](#).
- Heng Dong, Tonghan Wang, Jiayuan Liu, Chi Han, Chongjie Zhang, “Birds of a Feather Flock Together: A Close Look at Cooperation Emergence via Multi-Agent RL,” Manuscript 2021 [\[pdf\]](#).

Research Internship Experiences

Research Intern, Microsoft Research Asia | *Advised by Dr. Siwei Wang* **Dec 2022 – Mar 2023**

- *Multi-armed Bandits Algorithm Robust to Bounded Adversarial Corruptions*: proved the asymptotic optimality of policy gradient algorithms for corrupted bandits and demonstrated empirical robustness against baselines; published at AAMAS

Research Intern, University of Chicago (remote) | *Advised by Prof. Haifeng Xu* **Sept 2022 – Dec 2022**

- *Optimal Mechanism for Pricing a Machine Learning Model*: designed pricing schemes capturing the uncertainty of the quality-cost relationship in training ML models

Research Intern, EconCS Group, Harvard University | *Advised by Prof. Yiling Chen* **Feb 2022 – Aug 2022**

- *Cost-efficient Information Aggregation in Hierarchical Information Structure*: defined a mathematical model for hierarchical aggregation and designed a novel mechanism that minimizes the aggregator's expected payment
- *Extremization Analysis in Information Aggregation*: theoretically analyzed how extremization schemes improve Bayesian aggregation and validated the performance advantage on real-world datasets

Research Intern, Shanghai Qizhi Institute (founded by Prof. Andrew C. Yao) | *Advised by Prof. Zhixuan Fang* **2021**

- *Mechanism and Protocol Design in Blockchain Systems*: proposed a real-time recursive routing scheme (RTRR) and secure bidding protocol (HTLC-bid) for payment channel networks; validated with Lightning Network data and incorporated economic extensions (various bidding and transaction fee mechanisms); published at WiOpt 2022

Research Intern, the University of Hong Kong (remote) | *Advised by Prof. Zhiyi Huang* **July 2021 – Sept 2021**

- *AdWords in Recommendation Systems and Online Bipartite Matching*: reasoned the difficulty in AdWords w.r.t. Ranking algorithm family, improved the online correlated selection method

Research Intern, Tsinghua University | *Advised by Prof. Chongjie Zhang* **Apr 2020 – Mar 2021**

- *Cooperation Emergence and Leadership Emergence in Multi-agent Systems*: formally analyzed second-order social dilemmas from the perspective of evolutionary game theory and theoretical RL; used homophily to incentivize cooperation emergence, experimented in multi-agent reinforcement learning environments

Awards

- Excellent Graduation Thesis Award, Tsinghua University, 2023
- Second Prize for Outstanding Project in the 2022 Student Research Training (SRT) Program, Tsinghua University, 2022
- Gold Medal in the National Finals of the thirty-fifth China Physics Olympiad (CPhO), 2018
- Ranked 1st among 400 finalists (selected from over 50,000 contestants nationwide through two rounds of preliminaries) in the experiment section of the thirty-fifth CPhO, 2018
- First Prize in the thirty-second Shanghai Adolescent Science and Technology Innovation Contest, 2017

Honors and Scholarships

- Outstanding Graduate of Beijing, Beijing Municipal Commission of Education, 2023
- Outstanding Graduate of Tsinghua University (top 2% university-wide), Tsinghua University, 2023
- Departmental Outstanding Graduate, Institute for Interdisciplinary Information Sciences, Tsinghua University, 2023
- China National Scholarship (top 0.2% nationwide), Ministry of Education of the People's Republic of China, 2022
- Yao Award for Academic and Research Achievements, presented by Dean Andrew C. Yao of IIIS, Tsinghua, 2022
- Tang Lixin Scholarship for Merit Student, Tang Lixin Education Foundation, 2021
- Comprehensive Merit Award (three times), Tsinghua University, 2020, 2021, 2022
- ICBC Scholarship, Industrial and Commercial Bank of China, 2020
- Freshman Scholarship, Tsinghua University, 2019
- Xuetang Scholarship for Merit Student (four times), Tsinghua University, 2019, 2020, 2021, 2022
- Merit Student of No.2 High School of East China Normal University, 2018

Academic Services

- Reviewer for Journal of Artificial Intelligence Research (JAIR), IEEE Transactions on Networking, ACL, COLM
- Committee Member at Carnegie Mellon University Computer Science Department PhD Admissions Committee, 2025
- Volunteer at Tsinghua University Undergraduate Admissions Committee, 2020, 2021
- Teaching Assistant to Prof. Vincent Conitzer in *Computational Microeconomics* course at Carnegie Mellon University, Fall 2024 and Spring 2026
- Teaching Assistant to Prof. Zhixuan Fang in *Game Theory* course at Tsinghua University, 2023
- Teaching Assistant to Prof. Ran Duan in *Theory of Computation* course at Tsinghua University, 2023