

XIAOJIE MAO

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Lihua Building (李华楼) B418, Tsinghua University

EDUCATION BACKGROUND

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| Cornell University | New York, NY |
| Ph.D. in Statistics, with minor in Operations Research. | 2016.09 – 2021.05 |
| <ul style="list-style-type: none">• Thesis: <i>Machine Learning Methods for Data-Driven Decision Making</i>.• Thesis Committee: Nathan Kallus (Chair), Madeleine Udell (Co-Chair), Peter Frazier, Thorsten Joachims. | |
| M.S. in Statistics. | 2019.12 |
| Wuhan University | Wuhan, China |
| B.A. in Mathematical Economics. | 2012.09 – 2016.06 |
| Top 1% of 2016 graduates (among 7000+) awarded with 100% tuition waiver, major GPA 3.96 (rank 1/117), National Scholarship (国家奖学金) for 3 times. | |

WORK EXPERIENCE

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| Tsinghua University, School of Economics and Management (SEM) | Beijing, China |
| Associate Professor (untenured) in Management Science and Engineering. | 2024.07 – present |
| Assistant Professor in Management Science and Engineering. | 2021.07 – 2024.07 |
| <ul style="list-style-type: none">• Research Areas: data-driven decision making, causal inference, statistical machine learning. | |
| Tsinghua University, Research Center for Contemporary Management | Beijing, China |
| Associate Research Fellow | 2024.01 – present |
| Capital One | New York, NY |
| Data Science Researcher Intern | 2018.06 – 2018.08 |

PUBLICATIONS AND PREPRINTS (AUTHORSHIP IN ALPHABETICAL ORDER)

† indicates student mentees

Journal Publications

7. Guido Imbens, Nathan Kallus, Xiaojie Mao, Yuhao Wang. **Long-term causal inference under persistent confounding via data combination.** *Forthcoming in Journal of the Royal Statistical Society Series B.*
6. Nathan Kallus, Xiaojie Mao. **On the Role of Surrogates in the Efficient Estimation of Treatment Effects with Limited Outcome Data.** *Forthcoming in Journal of the Royal Statistical Society Series B.*
5. Nathan Kallus, Xiaojie Mao, Masatoshi Uehara. **Localized Debiased Machine Learning: Efficient Estimation of Quantile Treatment Effects, Conditional Value at Risk, and Beyond.** *Journal of Machine Learning Research, 2024.*
4. Nathan Kallus, Xiaojie Mao. **Stochastic Optimization Forests.** *Management Science, 2023.*
3. Yichun Hu, Nathan Kallus, Xiaojie Mao. **Fast Rates for Contextual Linear Optimization.** *Management Science (Fast Track), 2022.*

2. Yichun Hu, Nathan Kallus, Xiaojie Mao. **Smooth Contextual Bandits: Bridging the Parametric and Non-differentiable Regret Regimes.** *Operations Research*, 2022.
 - **Finalist for Applied Probability Society 2020 Best Student Paper Competition.**
 - Preliminary version accepted by the 33rd Annual Conference on Learning Theory (COLT 2020).
1. Nathan Kallus, Xiaojie Mao, Angela Zhou. **Assessing Algorithmic Fairness with Unobserved Protected Class Using Data Combination.** *Management Science (Special Section on Data-Driven Prescriptive Analytics)*, 2021.
 - Preliminary version accepted by NeurIPS 2019 workshop on Fair Machine Learning for Health and ACM FAT* 2020.
 - NeurIPS 2019 travel award.

Peer-Reviewed Conference Publications

7. Yichun Hu, Nathan Kallus, Xiaojie Mao, Yanchen Wu[†]. **Contextual Linear Optimization with Bandit Feedback.** *Forthcoming in Annual Conference on Neural Information Processing Systems*, 2024.
6. Andrew Bennett, Nathan Kallus, Xiaojie Mao, Whitney Newey, Vasilis Syrgkanis, Masatoshi Uehara. **Inference on Strongly Identified Functionals of Weakly Identified Functions.** *Conference on Learning Theory*, 2023.
5. Andrew Bennett, Nathan Kallus, Xiaojie Mao, Whitney Newey, Vasilis Syrgkanis, Masatoshi Uehara. **Minimax Instrumental Variable Regression and L2 Convergence Guarantees without Identification or Closedness.** *Conference on Learning Theory*, 2023.
4. Nathan Kallus, Xiaojie Mao, Kaiwen Wang[†], Zhengyuan Zhou. **Doubly Robust Distributionally Robust Off-Policy Evaluation and Learning.** *International Conference on Machine Learning*, 2022.
3. Nathan Kallus, Xiaojie Mao, and Angela Zhou. **Interval Estimation of Individual-level Causal Effects under Unobserved Confounding.** *International Conference on Artificial Intelligence and Statistics*, 2019.
2. Jiahao Chen, Nathan Kallus, Xiaojie Mao, Geoffrey Svacha, Madeleine Udell. **Fairness Under Unawareness: Assessing Disparity When Protected Class is Unobserved.** *ACM Conference on Fairness, Accountability, and Transparency in Machine Learning*, 2019.
1. Nathan Kallus, Xiaojie Mao, and Madeleine Udell. **Causal Inference with Noisy and Missing Covariates via Matrix Factorization.** *Annual Conference on Neural Information Processing Systems*, 2018.

Working Papers

7. Yong Liang, Xiaojie Mao, Shiyuan Wang[†]. **Online Joint Optimization of Inventory and Dynamic Assortment.**
6. Bowen Shi[†], Xiaojie Mao, Mochen Yang, Bo Li. **What, Why, and How: An Empiricist's Guide to Double/Debiased Machine Learning.** *SSRN working paper 4677153*.
5. Andrew Bennett, Nathan Kallus, Xiaojie Mao, Whitney Newey, Vasilis Syrgkanis, Masatoshi Uehara. **Source Condition Double Robust Inference on Functionals of Inverse Problems.** *arxiv preprint 2307.13793*.
4. Jian Chen, Zhehao Li[†], Xiaojie Mao. **Learning under Selective Labels with Data from Heterogeneous Decision-makers: An Instrumental Variable Approach.** *arxiv preprint 2306.07566*.

3. Yong Liang, Xiaojie Mao, Shiyuan Wang[†]. **Online Joint Assortment-Inventory Optimization under MNL Choices.** *arxiv preprint 2304.02022*.
2. Guido Imbens, Nathan Kallus, Xiaojie Mao. **Controlling for Unmeasured Confounding in Panel Data Using Minimal Bridge Functions: From Two-Way Fixed Effects to Factor Models.** *arXiv preprint arXiv: 2108.03849*.
1. Nathan Kallus, Xiaojie Mao, Masatoshi Uehara. **Causal Inference Under Unmeasured Confounding With Negative Controls: A Minimax Learning Approach.** *arXiv preprint arXiv: 2103.14029*.

TEACHING

Tsinghua University

Instructor

- Probability Theory and Mathematical Statistics (概率论与数理统计), 2022 - 2024 Fall (rated as top 5% of Tsinghua undergraduate level courses by students in 2023 Fall).
- Data Analytics: Inference and Decision-Making (数据分析: 推断与决策), 2022 - 2023 Spring, 2023 - 2024 Fall (rated as top 5% of Tsinghua graduate level courses by students in 2023 Fall).
- Empirical Methods in Management Science (管理科学中的实证方法), 2022 - 2024 Spring, 2024 Fall.

Cornell University

Teaching assistant

- ORIE 5750/CS 5785 Applied Machine Learning, 2019 Fall.
- STSCI 5110/ILRST 5110 Statistical Methods for Social Science, 2018 Spring.
- BTRY 6010/ILRST 6100 Statistical Methods I, 2016 Fall, 2017 Fall.

Wuhan University

Teaching assistant

- Introduction to Probability Theory, 2015 Fall.
- Introduction to Mathematical Statistics, 2015 Spring.

GRANTS

Theory and Methods of Data-driven Decision-Making, National Science Fund for Excellent Young Scholars (优秀青年科学基金项目), Principal Investigator (2024.01 - 2026.12)

Long-term Causal Inference and Decision-Making via Data Combination, Young Scientists Fund of NSFC (青年科学基金项目), Principal Investigator (2023.01 - 2025.12)

Intelligent Control Systems under Hardware Constraints, National Key R&D Program of China (科技创新 2030 重大项目), Participant (2023.01 - 2025.12)

Decision Theory and Methods for Supply Chain Resilience and Security, Major Program of NSFC (自然重大项目子课题), Participant (2023.01 - 2027.12)

AWARDS

Tsinghua University

- 2023 Award for Excellence in Teaching (学校年度教学优秀奖)

Tsinghua School of Economics and Management

- 2024 First Prize for Excellence in Teaching (学院教学优秀一等奖)
- 2023 Outstanding Faculty Award (学院先进工作者), 2023 Award for Excellence in Research (学院科研优秀奖), 2023 Second Prize for Excellence in Teaching (学院教学优秀二等奖)

AISTATS 2023 Top 10% Reviewer (2023.02)

Applied Probability Society Best Student Paper Competition, Finalist (2020)

Undergraduate National Scholarship (本科生国家奖学金), Ministry of Education (2013, 2014, 2015)

STUDENT MENTORING

Postdocs

- Xixi Li (李茜茜, PhD in Statistics from University of Manchester), Shuimu Tsinghua Scholar (水木学者), 2024-present.

Ph.D. Students (Main/Co-Advisor)

- Zhehao Li (李哲浩, 清华管科博士 21 级), 2021-present, co-advised with Jian Chen
- Shiyuan Wang (王诗媛, 清华管科博士 20 级), 2021-present, co-advised with Yong Liang
- Shangkun Che (车尚锟, 清华管科博士 20 级), 2021-present, co-advised with Hongyan Liu
- Tianrun Zhao (赵添润, 清华管科博士 23 级), 2024-present, co-advised with Yong Liang

Ph.D. Students (Ad-hoc Project Mentor)

- Yanchen Wu (吴彦辰, 清华管科博士 23 级), 2024-present, project mentor
- Bowen Shi (史博文, 清华管科博士 22 级), 2021-present, project mentor, joint with Bo Li

Master Students

- Hao Zhang (章昊, MBA 23 级), 2024-present
- Yuanju Fang (房远举, 清华金融硕士 24 级), 2024-present
- Shicheng Li (李柿澄, 清华-哥大商务分析硕士 23 级), 2023-present
- Haonan Zhou (周昊男, 清华-哥大商务分析硕士 23 级), 2023-present
- Yaning Xu (徐雅凝, 清华金融硕士 21 级), 2021-2023, first position: 上海鸣石私募基金

Undergraduate Students

- Songliang Chen (陈松良, 清华数学 21 级), 2023-present
- Chao Liu (刘超, 清华未央 21 级), 2024-present
- Peiran Su (苏沛然, 清华未央 22 级), 2024-present
- Bolin Fan (范博霖, 清华信管 22 级), 2024-present
- Zijia Chen (陈梓佳, 清华经金 21 级), 2024-present, first position: PhD in Management Science and Engineering, Tsinghua University.
- Boxuan Dong (董博宣, 清华经金 21 级), 2023, first position: Tsinghua-Columbia Dual Master's Degree Program in Business Analytics.
- Yihui He (何熠辉, 北大数学 20 级), 2023, first position: PhD in Statistics, Upenn Wharton.
- Sijia Liu (刘思嘉, 清华信管 20 级), 2023, first position: Tsinghua-Columbia Dual Master's Degree Program in Business Analytics.
- Yuhui Li (李禹辉, 清华致理 20 级), 2023, first position: Master in OR, Columbia University.
- Sijia Meng (孟思嘉, 清华信管 20 级), 2023-2024, first position: Master in Business Analytics, Guanghua School of Management at Peking University.

- Fuling Zhang (张福铃, 清华信管 20 级), 2023-2024, first position: Tsinghua-Columbia Dual Master's Degree Program in Business Analytics.
- Baojun Liao (廖葆均, 清华信管 19 级), 2022-2023, first position: 衍盛资产
- Zhiyuan Tang (唐致远, 清华自动化 18 级), 2022-2023, first position: PhD in Operations Management, Naveen Jindal School of Management at UT Dallas

ACADEMIC SERVICE

Editorial Service

Journal of System Science and System Engineering

- Associate editor 2025 - present
- Guest editor 2023 - 2024

Journal and Conference Paper Reviewer:

- Statistics and Econometrics: *Biometrika*, *Econometrica*, *Journal of the American Statistical Association*, *Journal of Econometrics*, *Journal of the Royal Statistical Society (Series B)*, *Review of Economics and Statistics*, *Statistics and Computing*, *Statistica Sinica*.
- Business and Management: *Information & Management*, *Information Systems Research*, *Management Science*, *Operations Research*, *Production and Operations Management*.
- Machine Learning and Data Mining: *Journal of Machine Learning Research*, *Data Mining and Knowledge Discovery*, *NeurIPS 2018 - 2023*, *ICML 2019 - 2022*, *AISTATS 2019 - 2023*, *ACM FAccT 2021 - 2022*.
- Others: *Mathematical Programming*, *Transportations Research*.

Conference Service

Area Chair: *NeurIPS 2024*, *ICML 2025*, *NeurIPS 2025*.

Session Chair:

- *INFORMS International Meeting 2025 (Singapore)*, session “Frontiers in Data-driven Decision Making Methods”.
- *POMS-HK 2024 (HKUST)*, session “Frontiers in Data-driven Decision Making Algorithms”.
- *American Causal Inference Conference 2024 (Seattle Washington)*, session “Long-Term Causal Inference”.

Member of Academic Committee (学术委员会), *National Conference on Supply Chain and Operation Management (ISCOM) 2024*.

Program committee for *NeurIPS 2018 workshop “Challenges and Opportunities for AI in Financial Services: the Impact of Fairness, Explainability, Accuracy, and Privacy”* and *NeurIPS 2020 workshop “Fair AI in Finance”*.

Administrative Service

- Tsinghua MS&E Faculty Hiring Committee Member 2021 - present
- Tsinghua MS&E Undergraduate Student Affairs Committee Member 2021 - present
- Tsinghua MS&E Master Student Affairs Committee Member 2021 - present
- Tsinghua MS&E Ph.D. Student Affairs Committee Member 2021 - present
- Tsinghua MS&E Research and Conference Coordination Committee Member 2021 - present
- Organizer, Tsinghua MS&E PhD student study group on Data-driven Decision-Making 2021 - 2024

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| Organizer, Tsinghua MS&E PhD student study group on Causal Inference + AI | 2023 - present |
| Undergraduate Student Advisor, SEM Class 41 (经 41 班班主任) | 2024 - present |

Other Service

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| Reviewer for grant proposals for National Science Foundation of China | 2024 - present |
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INVITED PRESENTATIONS

Conference or Workshop Presentations

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| Workshop on “Causal Inference: Bridging Theory and Practice”, Tsinghua Sanya International Mathematics Forum | 2025.01 |
| Excellent Scholar Talk (杰出学者论坛报告), National Conference on Supply Chain and Operation Management (ISCOM) | 2024.12 |
| Workshop on Data-Driven Decision-Making, University of Chinese Academy of Sciences | 2024.11 |
| Workshop on the Frontiers of Statistics and Management Science (第一届统计与管理科学前沿交叉论坛), University of Science and Technology of China | 2024.11 |
| Plenary talk, NSFC Young Scientist Fund Workshop (青年基金项目交流会特邀大会报告) | 2024.09 |
| Workshop on “Robustness meets Causality”, Shanghai Qizhi Institute | 2024.07 |
| Chinese Scholars Association for Management Science And Engineering Annual Conference | 2024.07 |
| Summer Workshop on AI for Business, INFORMS College on Artificial Intelligence | 2024.07 |
| Hangzhou International Conference on Frontiers of Data Science | 2024.07 |
| International Chinese Statistical Association Conference, Wuhan | 2024.06 |
| The 30th Anniversary of Wuhan University Institute of Advanced Study | 2024.06 |
| American Causal Inference Conference | 2024.04 |
| Chinese Causal Inference Conference | 2024.03 |
| The 14th POMS-HK International Conference | 2024.01 |
| National Conference on Supply Chain and Operation Management (ISCOM) | 2023.12 |
| INFORMS Annual Meeting 2023 Invited Session “Optimization for Experimentation and Personalization in Managerial Settings” | 2023.10 |
| Annual Conference on E-Commerce and Digital Innovations | 2023.08 |
| Hangzhou International Conference on Frontiers of Data Science | 2023.08 |
| International Conference on Service Systems and Service Management | 2023.08 |
| Chinese Scholars Association for Management Science and Engineering Annual Conference | 2023.07 |
| Productions and Operations Management Society Annual Conference | 2023.05 |
| American Causal Inference Conference | 2023.05 |
| INFORMS Annual Meeting 2021 Invited Session “Learning and Decision Making with Contextual Information” | 2021.11 |
| Tsinghua Symposium on Statistics and Data Science for Young Scholars | 2021.10 |
| INFORMS Annual Meeting 2021 Award Session for Applied Probability Society | 2021.11 |
| Kellogg-Wharton OM Workshop | 2020.07 |
| Conference of Learning Theory 2020 | 2020.07 |
| Atlantic Causal Inference Conference (cancelled due to COVID19) | 2020.05 |
| INFORMS Annual Meeting 2019 invited session “Learning & Optimization in Healthcare” | 2019.10 |
| INFORMS Annual Meeting 2019 invited session “Data-Driven Models and Algorithms” | 2019.10 |
| Annual Young Researchers Workshop, Cornell ORIE Department | 2019.10 |
| ACM FAT* 2019 | 2019.01 |

Department Seminars

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| Huazhong University of Science and Technology, School of Management | 2025.01 |
| Remin University, Institute of Statistics and Big Data | 2024.11 |
| University of Chinese Academy of Sciences, School of Economics and Management | 2024.09 |
| Beijing Jiaotong University, School of Economics and Management | 2024.06 |

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| Chinese University of Hong Kong (Shenzhen), School of Data Science | 2024.04 |
| Peking University, Guanghua School of Management | 2024.03 |
| Remin University, School of Statistics | 2023.05 |
| HKUST, Industrial Engineering and Decision Analytics | 2023.05 |
| New York University Shanghai | 2023.04 |
| Shanghai Jiaotong University, Antai College of Economics and Management | 2023.03 |
| Tsinghua University, Lab of Computational Social Science and State Governance | 2022.12 |
| Wuhan University, Department of Mathematical Economics and Mathematical Finance | 2021.06 |
| Tsinghua University, Department of Management Science and Engineering | 2020.12 |
| City University of Hong Kong, Department of Management Science | 2020.12 |
| Chinese University of Hong Kong, Department of Decision Science and Managerial Economics | 2020.12 |
| University of Hong Kong, Faculty of Business and Economics | 2020.11 |
| Shanghai University of Finance and Economics, Institute for Interdisciplinary Sciences | 2020.11 |
| Chinese University of Hong Kong, Department of Statistics | 2020.11 |
| Chinese University of Hong Kong (Shenzhen), School of Data Science | 2020.11 |
| Tsinghua University, Department of Management Science and Engineering | 2020.01 |
| Shanghai University of Finance and Economics, Institute for Interdisciplinary Sciences | 2020.01 |
| Shanghai Jiaotong University, John Hopcroft Center for Computer Science | 2020.01 |
| Wuhan University, Department of Mathematical Economics and Mathematical Finance | 2020.01 |

Other Presentations

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| Bear Club (狗熊会) Online Seminar | 2024.07 |
| Online Causal Inference Seminar | 2021.08 |
| University College London, Arthur Gretton's Group in Center for CSML | 2021.06 |
| Peking University, Xiaohua Zhou's Group in Department of Biostatistics | 2021.06 |
| Online Causal Inference Seminar | 2020.09 |
| Capital One workshop on Fair and Responsible AI in Finance | 2018.10 |