XIAOJIE MAO

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Lihua Building B418, Tsinghua University

EDUCATION BACKGROUND

Cornell University New York, NY

Ph.D. in Statistics, with minor in Operatiors Research. 2016.09 – 2021.05

- Thesis: *Machine Learning Methods for Data-Driven Decision Making.*
- 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 4 years.

WORK EXPERIENCE

Tsinghua University, School of Economics and Management (SEM) Beijing, China

Assistant Professor in Management Scince and Engineering (MS&E). 2021.07 – Present

- Research Areas: data-driven decision making, causal inference, statistical machine learning.

PUBLICATIONS AND PREPRINTS (AUTHORSHIP IN ALPHABETICAL ORDER)

Journal Publications

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

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, Geoffry 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

9. Yong Liang, Xiaojie Mao, Shiyuan Wang. **Online Joint Optimization of Inventory and Dynamic Assortment.**

8. 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.*

7. 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.*

6. Jian Chen, Zhehao Li, Xiaojie Mao. **Learning under Selective Labels with Data from Heterogeneous Decision-makers: An Instrumental Variable Approach.** *arxiv preprint 2306.07566.*

5. Yong Liang, Xiaojie Mao, Shiyuan Wang. **Online Joint Assortment-Inventory Optimization under MNL Choices.** *arxiv preprint 2304.02022.*

4. Guido Imbens, Nathan Kallus, Xiaojie Mao. **Long-term causal inference under persistent confounding via data combination**. *arxiv preprint 2202.07234.*

3. 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.*

2. Nathan Kallus, Xiaojie Mao, Masatoshi Uehara. **Causal Inference Under Unmeasured Confounding With Negative Controls: A Minimax Learning Approach.** *arXiv preprint arXiv: 2103.14029.*

1. Nathan Kallus, Xiaojie Mao. **On the Role of Surrogates in the Efficient Estimation of Treatment Effects with Limited Outcome Data.** *arXiv preprint arXiv: 2003.12408.*

TEACHING

Tsinghua University

Instructor

- Probability Theory and Mathematical Statistics, 2022 - 2024 Fall.
- Data Analytics: Inference and Decision-Making, 2022 - 2023 Spring, 2023 Fall
- Empirical Methods in Management Science, 2022 - 2023 Spring.

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 Resilance and Security, Major Program of NSFC (国自然重大项目子课题), Participant (2023.01 - 2027.12)

AWARDS

Tsinghua SEM: 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 (国家奖学金), Ministry of Education (2012 - 2016)

STUDENT MENTORING

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 (陈剑)
- Shiyuan Wang (王诗媛, 清华管科博士 20 级), 2021-present, co-advised with Yong Liang (梁湧)

Ph.D. Students (Project Mentor, Advising/Defense Committee Member)

- Bowen Shi (史博文, 清华管科博士 22 级), 2021-2023, project mentor
- Shangkun Che (车尚锟, 清华管科博士 20 级), 2021-2022, project mentor
- Zhe Wang (王哲, 清华管科博士 18 级), Defense Committee Member, first position: Assistant Professor in Information Systems, City University of Hong Kong

Master Students

- 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

- Yihui He (何熠辉, 北大数学 20 级), 2023-present

- Sijia Liu (刘思嘉, 清华信管 20 级), 2023, first position: Tsinghua-Columbia Business Analytics Master.

- Yuhui Li (李禹辉, 清华致理 20 级), 2023

- Sijia Meng (孟思嘉, 清华信管 20 级), 2023-2024, first position: Master in Business Analytics, Peking University.

- Fuling Zhang (张福铃, 清华信管 20 级), 2023-2024, first position: Tsinghua-Columbia Business Analytics Master.

- 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 at UT Dallas

ACADEMIC SERVICE

Editorial Service

Guest editor for Journal of System Science and System Engineering   2023 - present

Referee for Biometrika, Data Mining and Knowledge Discovery, Econometrica, Information & Management, Journal of the American Statistical Association, Journal of Econometrics, Management Science, Mathematical Programming, Operations Research, Production and Operations Management, Statistica Sinica, Transportations Research, NeurIPS 2018 - 2023, ICML 2019 - 2022, AISTATS 2019 - 2023, ACM FAccT 2021 - 2022.

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

MS&E Faculty Hiring Committee	2021 - present
MS&E Undergraduate Student Affairs Committee	2021 - present
MS&E Master Student Affairs Committee	2021 - present
MS&E Ph.D. Student Affairs Committee	2021 - present
MS&E Research and Conference Coordination Committee	2021 - present

INVITED PRESENTATIONS

Conference Presentations

Workshop on robustness meets causality, Shanghai Qizhi Institute	2024.07
Chinese Scholars Association for Management Science And Engineering Annual Conference	2024.07
Hangzhou International Conference on Frontiers of Data Science	2024.07
International Chinese Statistical Association Conference	2024.06
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

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 Governace	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

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