Ke Xu

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Google Scholar
Homepage

Education

- **University of Notre Dame** — Indiana, United States
  Ph.D. in Applied and Computational Mathematics and Statistics — Aug. 2023 - May 2028 (expected)
  Advisor: Prof. Yuefeng Han
- **University of Chicago** — Illinois, United States
  M.Sc. in Statistics — Sep. 2021 - Jun. 2023
  Advisors: Prof. Guillaume Bal and Prof. Lin S. Chen
- **Fudan University** — Shanghai, China
  B.Sc. in Statistics — Sep. 2016 - Jun. 2021
  Advisor: Prof. Xinsheng Zhang
- **University of Sydney** — New South Wales, Australia
  University-wide Exchange - School of Mathematics and Statistics — Jul. 2018 - Dec. 2018

Research Interests

- **Theory:** High-dimensional statistical inference for complex and structured data, with an emphasis on matrix and tensor data, dependent data, and adaptively collected data.
- **Methodology:** Design and theoretical analysis of regularized estimators, spectral methods, iterative algorithms, and nonconvex optimization methods for high-dimensional statistical models.

Preprints

[1] Elynn Chen, Yuefeng Han, Jiayu Li, and **Ke Xu@**. Modewise additive factor model for matrix time series. *arXiv preprint arXiv:2512.25025*, 2025. Under major revision at *Annals of Statistics*. https://doi.org/10.48550/arXiv.2512.25025.

[2] **Ke Xu**, Elynn Chen, and Yuefeng Han. Statistical inference for low-rank tensor models. *arXiv preprint arXiv:2501.16223*, 2025. https://doi.org/10.48550/arXiv.2501.16223.

(@ indicates alphabetical ordering authorship.)

Publications

[3] **Ke Xu** and Yuefeng Han. Guaranteed Noisy CP Tensor Recovery via Riemannian Optimization on the Segre Manifold. In *NeurIPS 2026*, 2026. Accepted (main track, poster). Earlier preprint: https://doi.org/10.48550/arXiv.2510.00569.

[4] Bowei Kang, David Li, **Ke Xu**, Jianhai Chen, Sihao Feng, Jinyu Wang, Guimin Gao, Shinya Tasaki, Brandon L Pierce, David A Bennett, et al. A flexible and unified framework for single-and multi-outcome mendelian randomization using summary statistics. *The American Journal of Human Genetics*, 2026. https://doi.org/10.1016/j.ajhg.2026.03.017.

[5] **Ke Xu**, Nathaniel Maydanchik*, Bowei Kang, Jianhai Chen, Qixiang Chen, Gongyao Xu, Shinya Tasaki, David A Bennett, and Lin S Chen. Integrative mendelian randomization for detecting exposure-by-group interactions using group-specific and combined summary statistics. *PLoS Genetics*, 21(9):e1011819, 2025. https://doi.org/10.1371/journal.pgen.1011819.

[6] Yihao Lu, **Ke Xu**, Nathaniel Maydanchik, Bowei Kang, Brandon L Pierce, Fan Yang, and Lin S Chen. An integrative multi-context mendelian randomization method for identifying risk genes across human tissues. *The American Journal of Human Genetics*, 111(8):1736–1749, 2024. https://doi.org/10.1016/j.ajhg.2024.06.012.

[7] Xinming Xu, Qingying Feng, Tao Zhang, Yunlong Gao, Qu Cheng, Wanqiu Zhang, Qinglong Wu, **Ke Xu**, Yucan Li, Nhu Nguyen, et al. Infant age inversely correlates with gut carriage of resistance genes, reflecting modifications in microbial carbohydrate metabolism during early life. *Imeta*, 3(2):e169, 2024. https://doi.org/10.1002/imt2.169.

(* indicates mentees.)

Honors

- **Winter 2022 (Statistical) Consulting Cup Award**, Dept. of Statistics, University of Chicago 2022
- **Tuition Scholarship**, University of Chicago 2021-2023
- **Third Prize Scholarship for Graduating Seniors**, Fudan University 2021
- **Second Prize Scholarship for Academic and Extracurricular Excellence**, Fudan University 2020

Presentations

- Invited Speaker, 2025 International Chinese Statistical Association (ICSA) China Conference, Zhuhai, China - Jul. 2025.
- Poster Presentation, Statistics Meets Tensors Workshop, Institute for Mathematical and Statistical Innovation (IMSI), Chicago - May. 2025.

Teaching

- **University of Notre Dame** Indiana, United States
  Graduate Teaching Assistant & Instructor Aug. 2023 - Present
  - **Instructor**
    ACMS 31600: Statistical Methods & Data Analysis I (Lab Sections 1–2) Spring 2025; Fall 2026
  - **Teaching Assistant**
    ACMS 60888: Statistical Computing and Monte Carlo Methods Fall 2023
    ACMS 60786: Applied Linear Models Fall 2023
    ACMS 60801: Statistical Inference Spring 2024, 2026
    ACMS 60850: Applied Probability Fall 2025
    ACMS 30530: Introduction to Probability Spring 2024, 2026; Fall 2024, 2025
    DS 60632: Behavioral Data Science Fall 2024
    DS 60645: Advanced Data Visualization Fall 2024

Service

- **Journal Referee:** Journal of the American Statistical Association; Journal of Business & Economic Statistics; PLOS Genetics.
- **Research Mentorship:** Nathaniel Maydanchik, now an undergraduate student at UCLA. [Our paper]
- **Professional Memberships:** Institute of Mathematical Statistics, American Statistical Association

Skills

- **Programming:** R (Rcpp, Shiny), Python, MATLAB.
- **Qualifications:** Society of Actuaries Exam P (Probability), SRM (Statistics for Risk Modeling), and FM (Financial Mathematics).
- **Languages:** English (Proficient), Mandarin (Native).