Zhimei Ren

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Employment

University of Pennsylvania
Assistant Professor of Statistics and Data Science, the Wharton School, 07/2023 - present
Affiliated Faculty, Applied Mathematics and Computational Science (AMCS), 07/2024 - present

University of Chicago
Postdoctoral Researcher, 07/2021 - 06/2023
Advisor: Rina Foygel Barber

Bain & Company
External Advisor, 07/2021 - 06/2022

Education

Stanford University
Ph.D. in Statistics, 06/2021
Advisor: Emmanuel Candès

Peking University
B.S. in Statistics, 07/2016

Visiting positions

Yale University
Student research intern, 08/2015 - 10/2015
Host: Harrison Huibin Zhou

Honors & awards

Rising Star in Data Science (University of Chicago), 2022

ACIC (American Causal Inference Conference) Travel Award, 2022

Waterloo Student Conference Presentation Award, 2021

Finalist of INFORMS Service Science Section 2021 Best Cluster Paper Award, 2021

Jerome H. Friedman Applied Statistics Dissertation Award, 2021

NeurIPS (Neural Information Processing Systems) Travel Award, 2019

First Prize of 2018 Citadel Datathon at Stanford, 2018

National Scholarship, Peking University, 2015

Yizheng Top Scholarship, Peking University, 2014

Academic Excellent Award, Peking University, 2014

Lee Wai Wing Scholarship, Peking University, 2013

Research interests

Statistics, machine learning, selective inference, distribution-free inference, data-driven decision making, causal inference, survival analysis

Publications

* stands for the alphabetical order or equal contribution.

30. Raphael Rossellini, Jake A. Soloff, Rina F. Barber, **Zhimei Ren**, and Rebecca Willett. "Can a calibration metric be both testable and actionable?" (2025). arXiv: arXiv:2502.19851 [stat.ME]. Pre-published.

29. Charlie K. Guan, **Zhimei Ren**, and Daniel Apley. "One-at-a-time knockoffs: controlled false discovery rate with higher power" (2025). arXiv: arXiv:2502.18750 [stat.ME]. Pre-published.

28. Junu Lee, Ilia Popov, and **Zhimei Ren**. "Full-conformal novelty detection: A powerful and non-random approach" (2025). arXiv: arXiv:2501.02703 [stat.ME]. Pre-published.

27. Yonghoon Lee and **Zhimei Ren**. "Selection from Hierarchical Data with Conformal e-values" (2025). arXiv: arXiv:2501.02514 [stat.ME]. Pre-published.

26. Jingyuan Wang, **Zhimei Ren**, Ruohan Zhan, and Zhengyuan Zhou. "Distributionally Robust Policy Learning under Concept Drifts" (2024). arXiv: arXiv:2412.14297 [cs.LG]. Pre-published.

25. Baiting Chen, **Zhimei Ren**, and Lu Cheng. "Conformalized Time Series with Semantic Features." (2024). *Advances in Neural Information Processing Systems 38 (NeurIPS 2024).*

24. Xiaomeng Wang, **Zhimei Ren**, and Jiancheng Ye. "Predicting survival time for critically ill patients with heart failure using conformalized survival analysis" (2024). medRxiv.

23. Yu Gui*, Ying Jin*, and **Zhimei Ren***. "Conformal Alignment: Knowing When to Trust Foundation Models with Guarantees". *Advances in Neural Information Processing Systems 38 (NeurIPS 2024).* arXiv: arXiv:2405.10301 [stat.ML].

22. Junu Lee and **Zhimei Ren**. "Boosting e-BH via conditional calibration" (2024). Submitted to *Journal of the Royal Statistical Society Series B: Statistical Methodology*. arXiv: arXiv:2404.17562 [stat.ME]. Under review.

21. Ying Jin* and **Zhimei Ren***. "Confidence on the Focal: Conformal Prediction with Selection-Conditional Coverage". *Journal of the Royal Statistical Society Series B: Statistical Methedology, to appear.* arXiv: arXiv:2403.03868 [stat.ME].

20. Parith Wongkittichote, Se Hyun Cho, Artis Miller, Kaitlyn King, Zackary M. Herbst, **Zhimei Ren**, Michael H. Gelb, and Xinying Hong. "UPLC-MS/MS Analysis of Urinary Oligosaccharides and Glycoamino Acids for the Diagnosis of Mucopolysaccharidosis and Glycoproteinosis". *Clinical Chemistry 70.6 (2024).*

19. Jiahao Ai and **Zhimei Ren**. "Not all distributional shifts are equal: Fine-grained robust conformal inference" (2024). *International Conference on Machine Learning (ICML 2024).* arXiv: arXiv:2402.17042 [stat.ME].

18. **Zhimei Ren**, Emil Y. Sidky, Rina Foygel Barber, Chien-Min Kao, and Xiaochuan Pan. "Simultaneous activity and attenuation estimation in TOF-PET with TV-constrained nonconvex optimization". *IEEE Transactions on Medical Imaging (2024).* arXiv: arXiv:2023.17042 [physics.med-ph].

17. Yuetian Luo, **Zhimei Ren**, and Rina F. Barber. "Iterative approximate cross-validation." *International Conference on Machine Learning (ICML 2023).*

16. Ying Jin*. **Zhimei Ren***, Zhuoran Yang, and Zhaoran Wang. "Policy learning 'without' overlap: Pessimism and generalized empirical Bernstein's inequality" (2022). *Annals of Statistics, to appear.* arXiv: arXiv:2212.09900 [cs.LG].

15. Yu Gui*, Rohan Hore*, **Zhimei Ren***, and Rina F. Barber. "Conformalized survival analysis with adaptive cutoffs". *Biometrika 111.2 (2024): 459-477.* arXiv: arXiv:2211.01227 [stat.ME].

14. **Zhimei Ren** and Rina F. Barber. "Derandomized knockoffs: leveraging e-values for false discovery rate control" (2022). *Journal of the Royal Statistical Society Series B: Statistical Methodology 86.1 (2024): 122-154.* arXiv: arXiv:2205.15461 [stat.ME].

13. Ying Jin*, **Zhimei Ren***, and Zhengyuan Zhou. "Sensitivity analysis under the f-sensitivity models: a distributional robustness perspective" (2022). Minor revision requested at *Operations Research.* arXiv: arXiv:2203.04373 [stat.ME]. Under review.

12. Ying Jin*, **Zhimei Ren***, and Emmanuel Candès. "Sensitivity analysis of individual treatment effects: a robust conformal inference approach". *Proceedings of the National Academy of Sciences 120.6 (2023): e2214889120.* arXiv: arXiv:2111.12161 [stat.ME].

11. Jiancheng Ye and **Zhimei Ren**. "Examining the impact of sex differences and the COVID-19 pandemic on health and health care: findings from a national cross-sectional study." *JAMIA Open (2022).* DOI: 10.1093/jamiaopen/ooac076.

10. Shuangning Li*, **Zhimei Ren***, Chiara Sabatti*, and Matteo Sesia*. "Transfer learning in genome-wide association studies with knockoffs". *Sankhya B (2022): 1-39.* arXiv: arXiv:2018.08813 [stat.AP].

9. Ruohan Zhan*, **Zhimei Ren***, Susan Athey, and Zhengyuan Zhou. "Policy learning with adaptively collected data". *Management Science 70.8 (2024): 5270-5297.* arXiv: arXiv:2105.02344 [stat.ML].

8. Emmanuel J. Candès*, Lihua Lei*, and **Zhimei Ren***. "Conformalized survival analysis". *Journal of the Royal Statistical Society (Series B) 85.1(2023): 24-45.* arXiv: arXiv:2103.09763 [stat.ME].

7. Maria Dimakopoulou, **Zhimei Ren**, and Zhengyuan Zhou. "Online multi-armed bandits with adaptive inference". *Advances in Neural Information Processing Systems 34 (NeurIPS 2021).* arXiv: arXiv:2102.13202 [cs.LG].

6. **Zhimei Ren**, Yuting Wei, and Emmanuel J. Candès. "Derandomizing knockoffs." *Journal of American Statistical Association 118.542 (2023): 948-958.* arXiv: 2012.02717 [stat.ME].

5. **Zhimei Ren** and Zhengyuan Zhou. "Dynamic batch learning in high-dimensional sparse linear contextual bandits". *Management Science 70.2 (2024): 1315-1342.* arXiv: arXiv:2008.11918 [stat.ML].

4. **Zhimei Ren**, Zhengyuan Zhou, and Jayant R. Kalagnanam. "Batched learning in generalized linear contextual bandits with general decision sets". *IEEE Control Systems Letters 6 (2020): 37-42.*

3. **Zhimei Ren** and Emmanuel J. Candès. "Knockoffs with side information." *The Annals of Applied Statistics 17.2 (2023):1152-1174.* arXiv: 2001.07835 [stat.ME].

2. Zijun Gao*, Yanjun Han*, **Zhimei Ren***, and Zhengqing Zhou*. "Batched multi-armed bandits problem". *Advances in Neural Information Processing Systems 32 (NeurIPS 2019).* (Oral, 0.5% acceptance.)

1. Garikoitz Lerma-Usabiaga, Pratik Mukherjee, **Zhimei Ren**, Michael L. Perry, and Brian A. Wandell. "Replication and generalization in applied neuroimaging". *Neuroimage* 202 (2019): 116048.

Talks

81. Joint Conference on Statistics and Data Science, Zhejiang, China, July 2025.
80. BIRS Workshop, Chennai, India, June 2025.
79. Economics Seminar, Rutgers University, April 2025.
78. Statistics Seminar, University of Wisconsin, Madison, April, 2025.
77. Econometrics and Statistics Colloquium, Booth School, University of Chicago, March 2025.
76. International Seminar on Selective Inference, January 2025.
75. PSOM Biomedical Data Science Seminar, University of Pennsylvania, January 2025.
74. Statistics Empowering Data Science (SEEDS) Conference, University of Southern California, January 2025.
73. International Conference on Statistics and Data Science, Nice, France, December 2024.
72. Workshop on Privacy and Interpretability in Generative AI: Peering into the Black Box, IDEAL, Chicago, Nov 2024.

71. Statistics Seminar (Virtual Talk), Xiamen University, Oct 2024.
70. INFORMS Annual Meeting, Oct 2024.
69. Epidemiology Seminar, University of Pennsylvania, Oct 2024.
68. Biostatistics Seminar, Vanderbilt University, August 2024.
67. Works-in-Progress Meeting, PAIR Center, University of Pennsylvania, August 2024.
66. Clubear Statistics Organization (Virtual Talk), China, August 2024.
65. Nankai University, Tianjin, China, July 2024.
64. EcoSta, Beijing, China, July 2024.
63. Seminar on Statistics and Data Science, Hong Kong University of Science and Technology, July 2024.
62. Joint Conference on Statistics and Data Science, Yunnan, China, July 2024.
61. Pacific Causal Inference Conference, Shanghai, China, July 2024.
60. WNAR Annual meeting, Colorado, June 2024.
59. Oberwolfach Workshop, Germany, May 2024.
58. Statistics and Data Science Seminar, Washington University in St. Louis, April 2024.
57. Department Seminar, Statistics, Harvard University, April 2024.
56. International Conference on Statistics and Data Science, Lisbon, Portugal, December 2023.
55. Econometrics seminar, Yale University, December 2023.
54. Institue of System Science, Chinese Academy of Sciences, October 2023.
53. INFORMS Annual Meeting, October 2023.
52. Joint IEDA/MATH Seminar, Hong Kong University of Science and Technology, July 2023.
51. Department Seminar, Statistics and Data Science, Fudan University, July 2023.
50. Northwestern Institute of Complex Systems, Northwestern University, April 2023.
49. Department Seminar, Technology, Operations, and Statistics, New York University, February 2023.
48. Department Seminar, Statistics and Data Science, Yale University, February 2023.
47. The Political Science Quantitative Methods Workshop, University of Chicago, February 2023.
46. Department Seminar, ISyE, Georgia Tech, February 2023.
45. Department Seminar, Statistics, University of California, Berkeley, February 2023.
44. Department Seminar, Statistcis, University of Toronto, February 2023.
43. Department Seminar, Statistics and Data Science, University of Pennsylvania, February 2023.
42. Department Seminar, Statistics, University of Chicago, January 2023.
41. Department Seminar, Statistics, University of Michigan, January 2023.
40. Department Seminar, IEMS, Northwestern University, January 2023.
39. Department Seminar, Statistics and Data Science, Carnegie Mellon University, January 2023.
38. Statistics Seminar, University of California, Los Angeles, January 2023.
37. Statistics Seminar, University of Washington, January 2023.

36. Department Seminar, Statistics and Data Sciences, University of Texas at Austin, January 2023.
35. Department Seminar, Statistics and Actuarial Science, University of Waterloo, December 2022.
34. Department Seminar, the Fuqua School of Business, Duke University, December 2022.
33. Statistics Seminar, Marshall School of Business, University of Southern California, December 2022.
32. The University of Chicago Rising Stars in Data Science Workshop, November 2022.
31. International Seminar on Selective Inference, November 2022.
30. Workshop in Operations Research and Data Science, Duke University, November 2022.
29. Matthew Stephens' Group Meeting, October 2022.
28. INFORMS Annual Meeting, October 2022.
27. AMS panel on recent advances in causal inference, University of Massachusetts Amherst, October 2022.
26. Multiple Comparison Procedure Conference, Breman, Germany, August 2022.
25. Distribution-Free Uncertainty Quantification Workshop, ICML, July 2022.
24. IEMS Seminar, Northwestern University, July 2022.
23. ICSA Applied Statistics Symposium, University of Florida, June 2022.
22. Bain & Company, June 2022.
21. Neyman Seminar, University of California, Berkeley, April 2022.
20. University of Massachusetts, Amherst, February 2022.
19. London School of Economics, February 2022.
18. Online Causal Inference Seminar, February. 2022.
17. Will Fithian's Group Meeting, December 2021.
16. Waterloo Student Conference in Statistics, Actuarial Science and Finance, November 2021.
15. TTIC Machine Learning Seminar, November 2021.
14. INFORMS Annual Meeting, October 2021.
13. INFORMS Annual Meeting, October 2021.
12. Joint Statistical Meeting, August 2021.
11. IFDS-MADLab Workshop, August 2021.
10. INFORMS Healthcare Conference, July 2021.
9. Seminar on Statistics and Data Science, the Hong Kong University of Science and Technology, June 2021.
8. American Control Conference, May 2021.
7. MOILS (Operation Management Lunch Seminar), New York University, November 2020.
6. INFORMS Annual Meeting, October 2020.
5. International Seminar on Selective Inference, October 2020.
4. Bernoulli-IMS One World Symposium, August 2020.

3. Seminar on Statistics and Data Science, the Hong Kong University of Science and Technology, March 2020.
2. 54th Annual Conference on Information Sciences and Systems, March 2020. (Canceled due to COVID-19).
1. Banff Workshop, March 2020. (Canceled due to COVID-19).

Software

3. `cfsurvival`: R package on conformalized survival analysis (on github).
2. `derandomKnock`: R package on derandomizing knockoffs (on github).
1. `adaptiveKnockoffs`: R package on knockoffs with side information (on github).

PhD students

3. Junu Lee, Ph.D. in Statistics and Data Science, 2023 - present (co-advised with T. Tony Cai).
2. Zhanran Lin, Ph.D. in Statistics and Data Science, 2024 - present (co-advised with Yuxin Chen and Yuting Wei).
1. Xiaomeng Wang, Ph.D. in Statistics and Data Science, 2023 - present.

Doctoral committee membership

2. Woonyoung Chang (Carnegie Mellon University, Statistics and Sata Science)
1. Yunda Hao (Centrum Wiskunde *&* Informatica, Mathematics and Statistics).

Teaching

As an instructor at the University of Pennsylvania

- Statistics 4310: Statistical inference, Fall 2023, Fall 2024.

As an instructor at Stanford University

- Statistics 302: Qualifying Exams Workshop (Theoretical Statistics), Summer 2018-2019.

As a teaching assistant at Stanford University

- Statistics 362: Monte Carlo Methods, Winter 2019-2020.
- Statistics 305: Methods for Applied Statistics, Spring 2018-2019.
- Statistics 200: Introduction to Statistical Inference, Autumn 2019-2020, Autumn 2018-2019, Winter 2017-2018, Winter 2016-2017.
- Statistics 237P: Theory of Investment Portfolios and Derivative Securities, Summer 2017-2018.

- Statistics 334: Mathematics and Statistics of Gambling, Spring 2017-2018.
- Statistics 206: Applied Multivariate Analysis, Autumn 2017-2018.
- Statistics 60/160: Introduction to Statistical Methods: Precalculus, Spring 2019-2020, Summer 2016-2017.
- Statistics 101: Data Science 101, Spring 2016-2017.
- Statistics 48N: Riding the Data Wave, Fall 2020-2021.

Grants

1. **NSF**: Trusted selective and predictive inference tools for modern data-driven applications (Award 2413135); $180,000; 07/01/2024-06/30/2027; Ren (PI).

Professional service

6. Organizer and chair of the session "The interplay between statistical inference and data-driven decision making" at the 2nd Joint Conference on Statistics and Data Science, 2024.
5. Organizer and chair of the session "Recent advances in distribution-free inference" at International Conference on Frontiers of Data Science, 2024.
4. PhD admissions committee, UPenn Statistics and Data Science department, 2023-2024.
3. Co-organizer of International Seminar on Selective Inference, 2023 - present.
2. Organizer of the session "Recent Advances in Statistical Methodology" at Joint Statistical Meeting (JSM), 2023.
1. Chair of session "Recent Advances in Statistical Methodology for Big Data" at Joint Statistical Meeting (JSM), 2021.

Invited discussion

3. For the talk "Summary statistics knockoffs inference with family-wise error rate control" by Jiaqi Gu, at the IBS journal club, Oct 2024.
2. For the talk "Leveraging sparsity in the Gaussian linear model for improved inference" by Lucas Janson, at International Seminar on Selective Inference, December 2023.
1. For the talk "Post-selection inference for e-value based confidence intervals" by Ziyu (Neil) Xu, at International Seminar on Selective Inference, March 2022.

Reviewer for Journals (56)[1]: (# papers in parentheses) Annals of Statistics (5), Artificial Intelligence (1), Bernoulli (1), Bioinformatics (1), Biometrics (4), Biometrika (1), BMC Medical Research Methodology (1), Electronic Journal of Statistics (2), Environmental and Ecological Statistics (1), IEEE Transactions on Information Theory (1), International Journal of Data Science and Analytics (1), Frontiers in Genetics(1), Journal of Applied Statistics (1), Journal of Computational and

[1]Reviews of revision not included.

Graphical Statistics (1), Journal of Machine Learning Research (1), Journal of the American Statistical Association (10), Journal of the Royal Statistical Society (Series B) (7), Machine Learning (2), Management Science (1), Mathematics (1), Nature Machine Intelligence (1), Operations Research (4), Scandinavian Journal of Statistics (1), Scientific Reports (1), Statistics (1), Statistics in Medicine (2), Statistical Science (2)

Reviewer for Conferences: (year in parentheses) American Control Conference (ACC, 2022), IEEE International Symposium on Information Theory (ISIT, 2021) International Conference on Machine Learning (ICML, 2022-2024), International Conference on Learning Representations (ICLR, 2022-2025), Neural Information Processing Systems (NeurIPS, 2021-2024)