Yuling Yan

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Appointments

Massachusetts Institute of Technology, Cambridge, MA *July. 2023 - Now*

- Norbert Wiener Postdoctoral Associate
- Affiliation: Institute for Data, Systems, and Society
- Mentors: Philippe Rigollet and Martin Wainwright

University of Wisconsin-Madison, Madison, WI *Starting Aug. 2024*

- (Incoming) Assistant Professor, Department of Statistics

Education

Princeton University, Princeton, NJ *Sept. 2018 - June 2023*

- Ph.D. in Operations Research and Financial Engineering
- Advisors: Yuxin Chen and Jianqing Fan
- Dissertation: Statistical Learning and Optimal Decision Making under Uncertainty

Peking University, Beijing, China *Sept. 2014 - July 2018*

- B.S. in Statistics (graduated with high distinction), School of Mathematical Sciences

Research Interests

Statistics, optimization, mathematics of data science, and their applications in economics and social sciences.

Awards

IMS Lawrence D. Brown Award, Institute of Mathematical Statistics *2024*
ICCM Best Thesis Award (Silver Medal), International Consortium of Chinese Mathematicians *2023*
Norbert Wiener Postdoctoral Fellowship, MIT *2023*
Charlotte Elizabeth Procter Honorific Fellowship, Princeton University *2022*
Best Student Paper Award (Statistical Learning & Data Science), American Statistical Association *2022*

Journal Publications

J1. **Yuling Yan**, Yuxin Chen, Jianqing Fan, "Inference for Heteroskedastic PCA with Missing Data," *Annals of Statistics*, vol. 52, no. 2, pp. 729-756, 2024.

J2. **Yuling Yan**, Gen Li, Yuxin Chen, Jianqing Fan, "Model-based Reinforcement Learning for Offline Zero-Sum Markov Games," accepted to *Operations Research*, 2024.

J3. **Yuling Yan**, Gen Li, Yuxin Chen, Jianqing Fan, "The Efficacy of Pessimism in Asynchronous Q-Learning," *IEEE Transactions on Information Theory*, vol. 69, no. 11, pp. 7185-7219, 2023.

J4. Yuxin Chen, Jianqing Fan, Bingyan Wang, **Yuling Yan (alphabetical order)**, "Convex and Nonconvex Optimization Are Both Minimax-Optimal for Noisy Blind Deconvolution under Random Designs," *Journal of the American Statistical Association*, vol. 118, no. 542, pp. 858-868, 2023.

J5. Yuxin Chen, Jianqing Fan, Cong Ma, **Yuling Yan (alphabetical order)**, "Bridging Convex and Nonconvex Optimization in Robust PCA: Noise, Outliers, and Missing Data," *Annals of Statistics*, vol. 49, no. 5, pp. 2948-2971, 2021.

J6. Yuxin Chen, Jianqing Fan, Cong Ma, **Yuling Yan (alphabetical order)**, "Inference and Uncertainty Quantification for Noisy Matrix Completion," *Proceedings of the National Academy of Science*, vol. 116, no. 46, pp. 22931-22937, 2019.

J7. Yuxin Chen, Yuejie Chi, Jianqing Fan, Cong Ma, **Yuling Yan (alphabetical order)**, "Noisy Matrix Completion: Understanding Statistical Guarantees for Convex Relaxation via Nonconvex Optimization," *SIAM Journal on Optimization*, vol. 30, no. 4, pp. 3098-3121, 2020.

J8. **Yuling Yan**, Bret Hanlon, Sebastien Roch, Karl Rohe, "Asymptotic Seed Bias in Respondent-driven Sampling," *Electronic Journal of Statistics*, vol. 14, no. 1, pp. 1577-1610, 2020.

Conference Publications

C1. Gen Li, **Yuling Yan**, Yuxin Chen, Jianqing Fan, "Minimax-Optimal Reward-Agnostic Exploration in Reinforcement Learning," *Conference on Learning Theory (COLT)*, 2024.

C2. Bingyan Wang*, **Yuling Yan***, Jianqing Fan ($*$ = **equal contribution**), "Sample-Efficient Reinforcement Learning for Linearly-Parameterized MDPs with a Generative Model," *Neural Information Processing Systems (NeurIPS)*, 2021.

C3. Kaizheng Wang, **Yuling Yan**, Mateo Díaz, "Efficient Clustering for Stretched Mixtures: Landscape and Optimality," *Neural Information Processing Systems (NeurIPS)*, 2020.

Preprints

P1. **Yuling Yan**, Martin J. Wainwright, "Entrywise Inference for Causal Panel Data: A Simple and Instance-Optimal Approach," arXiv preprint arXiv:2401.13665, 2024.

P2. Gen Li*, **Yuling Yan*** ($*$ = **equal contribution**), "Adapting to Unknown Low-Dimensional Structures in Score-Based Diffusion Models," arXiv preprint arXiv:2405.14861, 2024.

P3. Gen Li, **Yuling Yan**, Yuxin Chen, Jianqing Fan, "Minimax-Optimal Reward-Agnostic Exploration in Reinforcement Learning," arXiv preprint arXiv:2304.07278, 2023 (accepted in part to COLT 2024).

P4. **Yuling Yan**, Weijie J. Su, Jianqing Fan, "The Isotonic Mechanism for Exponential Family Estimation," arXiv preprint arXiv:2304.11160, under major revision at Journal of the Royal Statistical Society: Series B, 2024.

P5. **Yuling Yan***, Kaizheng Wang*, Philippe Rigollet ($*$ = **equal contribution**), "Learning Gaussian Mixtures Using Wasserstein-Fisher-Rao Gradient Flow," arXiv preprint arXiv:2301.01766, under minor revision at *Annals of Statistics*, 2023.

Invited Talks

T1. "Learning Gaussian Mixtures Using the Wasserstein-Fisher-Rao Gradient Flow," World Congress in Probability and Statistics, Bochum, Germany, Aug 2024.

T2. "The Isotonic Mechanism for Exponential Family Estimation," Joint Statistical Meeting, Portland, OR, Aug 2024.

T3. "Entrywise Inference for Causal Panel Data: A Simple and Instance-Optimal Approach," MIT SDSCon 2024, Cambridge, MA, Apr 2024.

T4. "Owner-Assisted Mechanisms for Exponential Family Estimation," ICSA Applied Statistics Symposium, Ann Arbor, MI, Jun 2023.

T5. "Inference and Uncertainty Quantification for Low-Rank Models," *Department Seminar*, Department of Technology, Operations and Statistics, NYU Stern School of Business, Feb 2023.

T6. "Inference and Uncertainty Quantification for Low-Rank Models," *Econometrics and Statistics Workshop*, University of Chicago Booth School of Business, Feb 2023.

T7. "Inference and Uncertainty Quantification for Low-Rank Models," *Department Seminar*, Department of Statistics, Rutgers University, Jan 2023.

T8. "Inference and Uncertainty Quantification for Low-Rank Models," *Department Seminar*, Department of Statistics, University of Wisconsin-Madison, Jan 2023.

T9. "Inference and Uncertainty Quantification for Low-Rank Models," *Department Seminar*, Department of Statistics, UC Davis, Jan 2023.

T10. "Inference and Uncertainty Quantification for Low-Rank Models," *Young Data Science Researcher Seminar*, ETH Zurich, Dec 2022.

T11. "Inference and Uncertainty Quantification for Low-Rank Models," *Department Seminar*, Department of Data Science and Operations, Marshall School of Business, University of Southern California, Dec 2022.

T12. "Inference for Heteroskedastic PCA with Missing Data," *CMStatistics*, King's College London, Dec 2022.

T13. "Inference and Uncertainty Quantification for Low-Rank Models," *Department Colloquia*, Department of Mathematics, University of Maryland, Nov 2022.

T14. "Inference and Uncertainty Quantification for Low-Rank Models," *Statistics Seminar*, Department of Mathematics, University of Maryland, Nov 2022.

T15. "Model-based Reinforcement Learning for Offline Zero-Sum Markov Games," *INFORMS Annual Meeting*, Indianapolis, IN, Oct 2022.

T16. "Inference for Heteroskedastic PCA with Missing Data," *INFORMS Annual Meeting*, Indianapolis, IN, Oct 2022.

T17. "Model-based Reinforcement Learning for Offline Zero-Sum Markov Games," *ORIE Young Researchers Workshop*, Cornell University, Oct 2022.

T18. "Inference for Heteroskedastic PCA with Missing Data," *Lunch Seminar*, Department of Statistics, Harvard University, Oct 2022.

T19. "Inference for Heteroskedastic PCA with Missing Data," *Joint Statistical Meeting*, Washington DC, Aug 2022.

T20. "Bridging Convex and Nonconvex Optimization in Robust PCA: Noise, Outliers, and Missing Data," *INFORMS Optimization Society Meeting*, Greenville, SC, Mar 2022.

T21. "Inference for Heteroskedastic PCA with Missing Data," *Department Seminar*, Department of Statistics and Applied Probability, UC Santa Barbara, Mar 2022.

T22. "Bridging Convex and Nonconvex Optimization in Robust PCA: Noise, Outliers, and Missing Data," *Two Sigma Ph.D. Research Symposium*, online, Dec 2020.

T23. "Bridging Convex and Nonconvex Optimization in Robust PCA: Noise, Outliers, and Missing Data," *INFORMS Annual Meeting*, online, Nov 2020.

T24. "Bridging Convex and Nonconvex Optimization in Robust PCA: Noise, Outliers, and Missing Data," *ORFE Graduate Student Seminar*, Princeton University, Oct 2020.

Professional Service

- Journal reviewer for *Annals of Statistics*, *Journal of the Royal Statistical Society: Series B*, *Journal of the American Statistical Association*, *Biometrika*, *Management Science*, *IEEE Transactions on Information Theory*, *Information and Inference: A Journal of the IMA*, *Journal of Business and Economic Statistics*, *IEEE Transactions on Signal Processing*, *Journal of Machine Learning Research*, *Journal of Multivariate Analysis*, *Journal of Computational and Graphical Statistics*, *IEEE Transactions on Computational Imaging*, *IEEE Signal Processing Letters*, *Journal of Nonparametric Statistics*.
- Conference reviewer for *Neural Information Processing Systems* (NeurIPS 2021-2023), *International Conference on Machine Learning* (ICML 2020-2024), *IEEE International Symposium on Information Theory* (ISIT 2020-2021), *International Conference on Learning Representations* (ICLR 2021).
- Organizing committee for *Conference on Statistical Foundations of Data Science and their Applications in celebration of Jianqing Fan's 60th Birthday*, May 2023.
- Poster session committee for *The Women in Data Science (WiDS) Cambridge Conference*, Mar 2024.

Short-time Visiting Positions

Massachusetts Institute of Technology, MA, USA *Sep. 2022 - Dec. 2022*

- Visiting student at Department of Mathematics, hosted by Philippe Rigollet

University of California, Berkeley, CA, USA *Aug. 2021 - Nov. 2021*

- Visiting student at Simons Institute for the Theory of Computing

Teaching Experience

- "Probability and Stochastic Systems" by Professor Ramon van Handel, Spring 2021, Teaching Assistant
- "Large-Scale Optimization for Data Science" by Professor Yuxin Chen, Fall 2019, Teaching Assistant
- "Statistical Learning" by Professor Jinzhu Jia, Fall 2017, Teaching Assistant