

# Yuling Yan

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## APPOINTMENTS

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**Massachusetts Institute of Technology**, MA, USA

July. 2023 - Now

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

## EDUCATION

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**Princeton University**, NJ, USA

Sept. 2018 - June 2023

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

**Peking University**, Beijing, China

Sept. 2014 - July 2018

- B.S. in Statistics, School of Mathematical Sciences

## RESEARCH INTERESTS

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Statistics, optimization, reinforcement learning, optimal transportation, and their applications in social sciences and biology.

## AWARDS

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| IMS Lawrence D. Brown Ph.D. Student Award, Institute of Mathematical Statistics                  | 2024 |
| Norbert Wiener Postdoctoral Fellowship, MIT  | 2023 |
| IMS Hannan Graduate Student Travel Award, Institute of Mathematical Statistics                   | 2023 |
| Charlotte Elizabeth Procter Honorific Fellowship, Princeton University                           | 2022 |
| Best Student Paper Award (Statistical Learning & Data Science), American Statistical Association | 2022 |
| Yang Xin Lotus Virtue Fellowship, Peking University  | 2017 |
| The May 4th Fellowship, Peking University  | 2016 |
| Samsung Fellowship, No. 2 High School Affiliated to East China Normal University                 | 2013 |

## JOURNAL PUBLICATIONS

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- J1. **Yuling Yan**, Gen Li, Yuxin Chen, Jianqing Fan, “The Efficacy of Pessimism in Asynchronous Q-Learning,” accepted to *IEEE Transactions on Information Theory*, 2023.
- J2. 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.
- J3. 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.
- J4. 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.
- J5. **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.

- 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.

## CONFERENCE PUBLICATIONS

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- C1. 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.
- C2. Kaizheng Wang, **Yuling Yan**, Mateo Díaz, “Efficient clustering for stretched mixtures: landscape and optimality,” *Neural Information Processing Systems (NeurIPS)*, 2020.

## PREPRINTS

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- P1. **Yuling Yan**, Weijie J. Su, Jianqing Fan, “The Isotonic Mechanism for Exponential Family Estimation,” arXiv preprint arXiv:2304.11160, 2023.
- P2. Gen Li, **Yuling Yan**, Yuxin Chen, Jianqing Fan, “Minimax-Optimal Reward-Agnostic Exploration in Reinforcement Learning,” arXiv preprint arXiv:2304.07278, 2023.
- P3. **Yuling Yan\***, Kaizheng Wang\*, Philippe Rigollet (\* = **equal contribution**), “Learning Gaussian Mixtures Using Wasserstein-Fisher-Rao Gradient Flow,” arXiv preprint arXiv:2301.01766, under major revision at *Annals of Statistics*, 2023.
- P4. **Yuling Yan**, Gen Li, Yuxin Chen, Jianqing Fan, “Model-based Reinforcement Learning for Offline Zero-Sum Markov Games,” arXiv preprint arXiv:2206.04044, under major revision at *Operations Research*, 2023.
- P5. **Yuling Yan**, Yuxin Chen, Jianqing Fan, “Inference for Heteroskedastic PCA with Missing Data,” arXiv preprint arXiv:2107.12365, under major revision at *Annals of Statistics*, 2023 (**2022 ASA Statistical Learning and Data Science Section Best Student Paper Award**).

## INVITED TALKS

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- T1. “Owner-Assisted Mechanisms for Exponential Family Estimation,” ICSA Applied Statistics Symposium, Ann Arbor, MI, Jun 2023.
- T2. “Inference and Uncertainty Quantification for Low-Rank Models,” *Department Seminar*, Department of Technology, Operations and Statistics, NYU Stern School of Business, Feb 2023.
- T3. “Inference and Uncertainty Quantification for Low-Rank Models,” *Econometrics and Statistics Workshop*, University of Chicago Booth School of Business, Feb 2023.
- T4. “Inference and Uncertainty Quantification for Low-Rank Models,” *Department Seminar*, Department of Statistics, Rutgers University, Jan 2023.
- T5. “Inference and Uncertainty Quantification for Low-Rank Models,” *Department Seminar*, Department of Statistics, University of Wisconsin-Madison, Jan 2023.
- T6. “Inference and Uncertainty Quantification for Low-Rank Models,” *Department Seminar*, Department of Statistics, UC Davis, Jan 2023.
- T7. “Inference and Uncertainty Quantification for Low-Rank Models,” *Young Data Science Researcher Seminar*, ETH Zurich, Dec 2022.
- T8. “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.
- T9. “Inference for Heteroskedastic PCA with Missing Data,” *CMStatistics*, King’s College London, Dec 2022.
- T10. “Inference and Uncertainty Quantification for Low-Rank Models,” *Department Colloquia*, Department of Mathematics, University of Maryland, Nov 2022.
- T11. “Inference and Uncertainty Quantification for Low-Rank Models,” *Statistics Seminar*, Department of Mathematics, University of Maryland, Nov 2022.
- T12. “Model-based Reinforcement Learning for Offline Zero-Sum Markov Games,” *INFORMS Annual Meeting*, Indianapolis, IN, Oct 2022.

- T13. "Inference for Heteroskedastic PCA with Missing Data," *INFORMS Annual Meeting*, Indianapolis, IN, Oct 2022.
- T14. "Model-based Reinforcement Learning for Offline Zero-Sum Markov Games," *ORIE Young Researchers Workshop*, Cornell University, Oct 2022.
- T15. "Inference for Heteroskedastic PCA with Missing Data," *Lunch Seminar*, Department of Statistics, Harvard University, Oct 2022.
- T16. "Inference for Heteroskedastic PCA with Missing Data," *Joint Statistical Meeting*, Washington DC, Aug 2022.
- T17. "Bridging Convex and Nonconvex Optimization in Robust PCA: Noise, Outliers, and Missing Data," *INFORMS Optimization Society Meeting*, Greenville, SC, Mar 2022.
- T18. "Inference for Heteroskedastic PCA with Missing Data," *Department Seminar*, Department of Statistics and Applied Probability, UC Santa Barbara, Mar 2022.
- T19. "Bridging Convex and Nonconvex Optimization in Robust PCA: Noise, Outliers, and Missing Data," *Two Sigma Ph.D. Research Symposium*, online, Dec 2020.
- T20. "Bridging Convex and Nonconvex Optimization in Robust PCA: Noise, Outliers, and Missing Data," *INFORMS Annual Meeting*, online, Nov 2020.
- T21. "Bridging Convex and Nonconvex Optimization in Robust PCA: Noise, Outliers, and Missing Data," *ORFE Graduate Student Seminar*, Princeton University, Oct 2020.

## PROFESSIONAL SERVICE

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- Organizing committee for *Conference on Statistical Foundations of Data Science and their Applications in celebration of Jianqing Fan's 60th Birthday*, May 2023.
- Session chair for 2022 *INFORMS Annual Meeting* at Indianapolis, IN.
- Journal reviewer for *Annals of Statistics*, *Journal of the American Statistical Association*, *Biometrika*, *Management Science*, *IEEE Transactions on Information Theory*, *IEEE Transactions on Signal Processing*, *Journal of Multivariate Analysis*, *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 2020-2022)*, *IEEE International Symposium on Information Theory (ISIT 2020-2021)*, *International Conference on Learning Representations (ICLR 2021)*, *Annual Conference on Information Sciences and Systems (CISS 2020)*.

## VISITING POSITIONS

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| <b>Massachusetts Institute of Technology</b> , MA, USA                                 | Sep. 2022 - Dec. 2022 |
| • Visiting student at Department of Mathematics, hosted by Professor Philippe Rigollet |                       |
| <b>University of California, Berkeley</b> , CA, USA                                    | Aug. 2021 - Nov. 2021 |
| • Visiting student at Simons Institute for the Theory of Computing                     |                       |

## TEACHING EXPERIENCE

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- "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