Yuetian Luo

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ACADEMIC APPOINTMENT

University of Chicago Postdoctoral Scholar *Data Science Institute* July 2022 - Present
Mentor: Prof. Rina Foygel Barber

EDUCATION

University of Wisconsin–Madison Ph.D. *Department of Statistics* Sept 2017 - May 2022
Advisor: Prof. Anru Zhang

Renmin University of China B.S *School of Statistics* Sept 2013 - June 2017

The University of Hong Kong Exchange Program Jan 2016 - June 2016

RESEARCH INTEREST

Distribution-free inference, high-dimensional statistics, optimization, computational complexity of statistical inference, tensor learning and robust statistics.

EXPERIENCE

Long-term Visiting Student at the **Simons Institute for the Theory of Computing** at UC Berkeley for Program "Computational Complexity of Statistical Inference" 2021 Fall

SELECTED HONORS AND AWARDS

IMS Lawrence D. Brown PhD Student Award 2023
ASA Student's Paper Award of Statistical Learning and Data Science Section 2022
University of Wisconsin – Madison graduate student Scholarship Sep 2017
1st Prize Scholarship for outstanding students in study (2 times) Sep 2015- Sep 2016

PAPER UNDER SUBMISSION

- **Luo, Y.**, Gao, C., (2024). Adaptive Robust Confidence Intervals. Available on arXiv.
- **Luo, Y.**, Barber, R. F., (2024). The Limits of Assumption-free Tests for Algorithm Performance. Submitted. Available on arXiv.
- **Luo, Y.**, Barber, R. F., (2024). Is Algorithmic Stability Testable? A Unified Framework under Computational Constraints. Submitted. Available on arXiv.

PAPER UNDER REVISION

- **Luo, Y.,** Garcia Trillos, N. (2022). Nonconvex Matrix Factorization is Geodesically Convex: Global Landscape Analysis for Fixed-rank Matrix Optimization From a Riemannian Perspective. *Mathematical Programming, Series A*, major revision under review. Available on arXiv.

PUBLICATIONS

- **Luo, Y**., Gao, C., (2024+). Computational Lower Bounds for Graphon Estimation via Low-degree Polynomials. *The Annals of Statistics,* to appear. Available on arXiv.
- **Luo, Y**., Li, X., Zhang, A. R., (2024+). Nonconvex Factorization and Manifold Formulations are Almost Equivalent in Low-rank Matrix Optimization. *INFORMS Journal on Optimization*, to appear. Available on arXiv.
- **Luo, Y.,** Zhang, A. R., (2024+). Tensor-on-Tensor Regression: Riemannian Optimization, Over-parameterization, Statistical-Computational Trade-offs, and Their Interplay. *The Annals of Statistics,* to appear. Available on arXiv.
- **Luo, Y.,** Huang, W., Li, X., Zhang, A. R., (2024). Recursive Importance Sketching for Rank Constrained Least Squares: Algorithms and High-order convergence. *Operations Research,* 72(1), 237-256. https://doi.org/10.1287/opre.2023.2445.
- **Luo, Y**., Li, X., Zhang, A. R., (2024). On Geometric Connections of Embedded and Quotient Geometries in Riemannian Fixed-rank Matrix Optimization. *Mathematics of Operations Research*, 49(2), 782-825. https://doi.org/10.1287/moor.2023.1377.
- **Luo, Y.,** Ren, Z., Barber, R. F., (2023). Iterative Approximate Cross-Validation*, International Conference on Machine Learning (ICML),* (pp. 23083-23102). https://proceedings.mlr.press/v202/luo23d.html.
- **Luo, Y.,** Zhang, A. R., (2023). Low-rank tensor estimation via Riemannian Gauss-Newton: Statistical optimality and second-order convergence. *Journal of Machine Learning Research,* 24(1), 18274-18321. https://dl.acm.org/doi/abs/10.5555/3648699.3649080.
- Diakonikolas, I., Kane M. D., **Luo, Y.,** Zhang, A. R., (2023). Statistical and Computational Limits for Tensor-on-tensor Association Detection, *Conference of Learning Theory (COLT),* (pp. 5260-5310). https://proceedings.mlr.press/v195/diakonikolas23d.html. ***(Alphabetical order)***
- **Luo, Y.,** Zhang, A. R. (2022). Tensor clustering with planted structures: Statistical optimality and computational limits. *The Annals of Statistics,* 50(1), 584-613. https://doi.org/10.1214/21-AOS2123.
- Han, R., **Luo, Y.,** Wang, M., Zhang, A. R., (2022). Exact Clustering in Tensor Block Model: Statistical Optimality and Computational Limit. *Journal of the Royal Statistical Society, Series*

B: Statistical Methodology, 84(5), 1666-1698. https://doi.org/10.1111/rssb.12547. ***(This paper received the Student's Paper Award of Statistical Learning and Data Science Section of ASA)***

- **Luo, Y.,** Ma, Q., Zhang, C., Zhang, A. R., (2022). Provable Second-order Riemannian Gauss-Newton Method for Low-rank Tensor Estimation. *IEEE International Conference on Acoustics, Speech, and Signal Processing (IEEE ICASSP).* 10.1109/ICASSP43922.2022.9747487**.**
- **Luo, Y.**, Raskutti, G., Yuan, M., Zhang, A. R., (2021). A Sharp Blockwise Tensor Perturbation Bound for Tensor Power Iteration. *Journal of Machine Learning Research,* 22(179): 1-48. https://www.jmlr.org/papers/v22/20-919.html.
- **Luo, Y.**, Han, R., Zhang, A. R., (2021). A Schatten-q Perturbation Analysis via Perturbation Projection Error Bound. *Linear Algebra and its Applications,* 630:225-240. https://doi.org/10.1016/j.laa.2021.08.005.
- Zhang, A. R., **Luo, Y.**, Raskutti, G., Yuan, M., (2020). ISLET: Fast and Optimal Low-rank Tensor Regression via Importance Sketching. *SIAM Journal on Mathematics of Data Science,* 2(2): 444-479. https://doi.org/10.1137/19M126476X.
- **Luo, Y.,** & Zhang, A. R., (2020). Open problem: Average-case hardness of hypergraphic planted clique detection. *Conference on Learning Theory (COLT),* 3852-3856. https://proceedings.mlr.press/v125/luo20a.html.
- Li, Y., **Luo, Y.**, Ferrari, D., Hu, X., Qin, Y., (2019). Model Confidence Bounds for Variable Selection. *Biometrics (with discussion)* 75(2): 392-403. https://doi.org/10.1111/biom.13024.
- Li, Y., **Luo, Y.,** Ferrari, D., Hu, X., Qin, Y., (2019). Rejoinder to Discussions on: Model confidence bounds for variable selection. *Biometrics,* 75(2): 411-413. https://doi.org/10.1111/biom.13020.
- **Luo, Y.**, Pardos, Z.A, (2018). Diagnosing University Student Subject Proficiency and Predicting Degree Completion in Vector Space. *In Proceedings of the AAAI Conference on Artificial Intelligence,* 32(1): 1-8. https://doi.org/10.1609/aaai.v32i1.11390.

PROFESSIONAL SERVICE

Reviewer for The Annals of Statistics; Journal of Royal Statistical Society Series B; Journal of American Statistical Society; Journal of Machine Learning Research; IEEE Transactions on Information Theory; Mathematical Programming, Series A; International Conference on Machine Learning; Conference on Neural Information Processing Systems; BIT Numerical Mathematics; Bernoulli; The Canadian Journal of Statistics; SIAM Journal on Matrix Analysis and Applications; ACM Symposium on the Theory of Computation (STOC); Mathematical Programming Computation; Stat

INVITED AND CONTRIBUTED TALKS

International Symposium on Mathematical Programming (ISMP)	2024 July
IMS/WNAR Meeting	2024 Jun
International Seminar on Selective Inference (ISSI)	2024 May
IMS Young Mathematical Scientists Forum — Statistics and Data Science	2023 Nov
Spotlight Talk at IMSI Program Algebraic Statistics and Our Challenging World	2023 Nov
Joint Statistical Meetings	2023 Aug
SIAM Optimization Conference	2023 June
Joint Mathematics Meeting	2023 Jan
INFORMS Annual Meeting	2022 Fall
University of Wisconsin-Madison IFDS Ideas Forum	2022 Fall
University of Wisconsin-Madison IFDS Ideas Forum	2021 Fall
Simons Institute for the Theory of Computing, Student Seminar	2021 Fall
Simons Institute for the Theory of Computing, Manifold Optimization Working Group	2021 Fall
Joint Statistical Meetings	2021
University of Wisconsin-Madison IFDS Ideas Forum	2020 Fall
Joint Statistical Meetings	2020
University of Wisconsin-Madison IFDS Brown Bag	2020 Spring

TEACHING AND MENTORING EXPERIENCE

Data Science Institute Data Science Clinic Program (mentor)	2022 Fall, 2023 Winter/Spring
Two Guest Lectures on SQ Model in “High dimensional Testing” taught by Chao Gao	2023 Winter
STAT 679/615 Statistical Learning Theory, TA	2019 Spring/2020 Spring
STAT 601 Linear Model (graduate level), Discussion TA	2019 Fall
STAT 610 Statistical Inference (graduate level), Discussion TA	2018 Fall/2022 Spring
STAT 371 Introduction to Statistics, Discussion TA	2017 Fall / 2018 Spring