Sifan Liu

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Education

Stanford University — **Stanford, CA**
Ph.D. student in Statistics — *Sept 2019 - June 2024 (expected)*

Tsinghua University — **Beijing, China**
Bachelor of Mathematics (with distinction) — *Sept 2015 - July 2019*
Minor in Computer Science

Research interests

- Selective inference, inference after model selection
- Monte Carlo and quasi-Monte Carlo methods
- Machine learning
- Sketching

Publications

Journal Publications

- **Liu, S.**, Owen, A. B. (2023). Preintegration via Active Subspace. *SIAM Journal on Numerical Analysis*, 61(2), 495-514.
- Cappello, L., Kim, J., **Liu, S.**, and Palacios, J. A. (2022). Statistical Challenges in Tracking the Evolution of SARS-CoV-2. *Statistical Science*, 37(2), 162-182.
- Chen, S., **Liu, S.**, Ma, Z. (2022). Global and Individualized Community Detection in Inhomogeneous Multilayer Networks. *Annals of Statistics*, 50(5), 2664-2693.
- **Liu, S.**, Owen, A. B. (2021). Quasi-Monte Carlo Quasi-Newton for Variational Bayes. *Journal of Machine Learning Research*, 22(1), 11043-11065.
- Yang, F., **Liu, S.**, Dobriban, E., Woodruff, D. P. (2021). How to Reduce Dimension with PCA and Random Projections? *IEEE Transactions on Information Theory*, 67(12), 8154-8189.

Conference Publications

- Lacotte, J., **Liu, S.***, Dobriban, E., Pilanci, M. (2020). Limiting Spectrum of Randomized Hadamard Transform and Optimal Iterative Sketching Methods. *NeurIPS 2020*. arXiv:2002.00864
- **Liu, S.**, Dobriban, E. (2020). Ridge Regression: Structure, Cross-Validation, and Sketching. *ICLR 2020*, **Spotlight presentation**. arXiv:1910.02373
- Dobriban, E., **Liu, S.** (2019). Asymptotics for Sketching in Least Squares Regression. *NeurIPS 2019*. arXiv:1810.06089

Submissions

- **Liu, S**. (2022). Conditional Quasi-Monte Carlo with Constrained Active Subspaces. Under revision at *SIAM Journal of Scientific Computing*. arXiv:2212.13232
- **Liu, S.** (2023). An Exact Sampler for Inference after Polyhedral Model Selection. Under review. arXiv:2308.10346
- **Liu, S.**, Panigraphi, S. (2023). Selective Inference with Distributed Data. Under review. arXiv:2301.06162
- **Liu, S.**, Markovic, J., Taylor, J. (2022). Black-box Selective Inference via Bootstrapping. Under review. arXiv:2203.14504

(* equal contributions)

Awards

- Foundation of Computational Mathematics (FoCM) travel award, 2023
- Stanford Data Science Scholars, 2021-2023
- Tsinghua Scholarship for comprehensive distinction, 2018
- Tsinghua scholarship for outstanding academic performance, 2017
- First Prize of National Mathematical Olympiad (top 0.01%), 2014

Talks

- International Conference on Monte Carlo Methods and Applications (MCM), June 2023, Paris
- Foundations of Computational Mathematics (FoCM) poster presentation, June 2023, Paris
- ICSA Applied Statistics Symposium, June 2023, Ann Arbor, Michigan
- International Seminar on Selective Inference, April 2023, virtual
- Ninth Workshop on High-Dimensional Approximation (HDA), February 2023, Australian National University, Australia
- Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing (MCQMC), July 2022, Linz, Austria
- 2021 Joint Statistical Meetings, August 2021, virtual
- International Conference on Monte Carlo Methods and Applications (MCM), August 2021, virtual

Reviewing

Journals: IEEE Journal on Selected Areas in Information Theory (JSAIT), IEEE Transactions on Information Theory, Journal of Machine Learning Research (JMLR), SIAM Journal on Mathematics of Data Science (SIMODS), Journal of the American Statistical Association (JASA), Information and Inference: A Journal of the IMA

Conferences: NeurIPS (2020), ICML (2021, 2022), ICLR (2021, 2022, 2023), MCQMC (2021)

Industry experience

- **Two Sigma Investment**
  Quantitative research internship *June 2022 - Aug 2022*

Teaching experience

- Inclusive mentorship in data science (mentor)
- STATS 60/160 Introduction to Statistical Methods (TA)
- STATS 100 Mathematics of Sports (TA)
- STATS 101 Data Science 101 (TA)
- STATS 110 Statistical Methods in Engineering and the Physical Sciences (TA)
- STATS 141 Biostatistics (TA)
- STATS 202 Data mining and analysis (TA)
- STATS 206 Applied multivariate analysis (TA)
- STATS 214/CS 229M Machine Learning Theory (TA)
- STATS 223/323 Sequential analysis (TA)
- STATS 320/NBIO 220/CS 339N Machine Learning Methods for Neural Data Analysis (TA)
- STATS 334/MATH 231 Mathematics and Statistics of Gambling (TA)