

Ziang Niu

Second-year Statistics Ph.D. Student

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Education

University of Pennsylvania (Philadelphia, PA), Ph.D. in Statistics, 2028 (expected).
Research Advisor: Eugene Katsevich and Bhaswar B. Bhattacharya.

University of Pennsylvania (Philadelphia, PA), M.A. in Applied Mathematics, 2023.
Research Advisor: Eugene Katsevich and Bhaswar B. Bhattacharya.

Renmin University of China (Beijing, China), B.A. in Economic Statistics, 2021.
Thesis Advisor: Wei Li.

Experience

Student academic research

Ph.D. student researcher, University of Pennsylvania (2023–now).

I have been developing novel theories and methodologies for application-driven conditional independence, model calibration problems and adaptive experiments. See [6, 7, 8, 9].

Master student researcher, University of Pennsylvania (2021–2023).

I developed novel theory and methodology for (conditional) independence testing and high-dimensional inference problems. See [3, 4, 5].

Undergraduate student researcher, Renmin University of China, (2020–2021).

I designed, studied theoretically, and implemented a two-stage framework to conduct the causal inference for high-dimensional treatment allowing for unobserved confounding. See [2].

Undergraduate student researcher, University of College London, (2020).

I proposed a novel method to boost the inference for intractable likelihood models with the Quasi-Monte Carlo method. See [1].

Fellowship and Awards

- Conference on Monte Carlo Methods and Applications Student Travel Award (2025).
Institute for Mathematical and Statistical Innovation, Chicago.
- Lawrence David Brown Best Student Paper Award (2024).
Department of Statistics and Data Science at Wharton, UPenn.
- SIAM Annual Meeting Student Travel Award (2021).
Society for Industrial and Applied Mathematics.
- Undergraduate Study Scholarship (2017–2019).
Renmin University of China.

Professional Service Activities

- *Reviewer*, AoAP, Bernoulli, EJS, JASA, JMLR, JRSS-A, NeurIPS.
- *Organizer*, ICSA-Canada Chapter Symposium (2024).
I organized and chaired the session "Topic in Combinatorial Inference", which included inviting speakers, coordinating the conference schedule with the speakers and hosting the session.

Presentations

Invited Seminar Presentations

- *Assumption-lean weak limits and tests for two-stage adaptive experiments*
International Seminar on Selective Inference, Jun. 3, 2025. [[Slides](#)]
- *Computationally efficient and statistically accurate conditional independence testing with spaCRT*
International Seminar on Selective Inference, Nov. 4, 2024. [[Slides](#)]

Invited Conference Oral Presentations

- *Assumption-lean weak limits and tests for two-stage adaptive experiments*
International Indian Statistical Association Conference, Jun. 12, 2025.
- *Discrepancy-based Inference for Intractable Generative Models using Quasi-Monte Carlo.*
15th International Conference on Monte Carlo Methods and Applications (MCM), July. 28– Aug. 1, 2025, in Chicago, USA.

Contributed Conference Oral Presentations

- *Detect model miscalibration via your nearest neighbor*
Bernoulli-ims 11th World Congress in Probability and Statistics, Aug. 12-16, 2024, in Bochum, Germany. [[Slides](#)]
- *A reconciliation between finite-sample and asymptopia-based methods in conditional independence testing*
Lawrence David Brown student workshop, Mar. 22, 2024, in Philadelphia, USA. [[Slides](#)]
Joint Statistical Meeting, Aug. 5-10, 2023, in Toronto, Canada.
- *Inference for ATE using heterogeneity: generalized 2SLS and double machine learning perspectives*
Statistical Society of Canada Annual Meeting, May 28-31, 2023, in Ottawa, Canada.
- *Discrepancy-based Inference for Intractable Generative Models using Quasi-Monte Carlo.*
Lifting Inference with Kernel Embeddings, Jan. 10–14, 2022, online. [[Video](#)] [[Slides](#)]
- *Estimation and inference for high-dimensional nonparametric additive instrumental-variables regression.*
Chinese R Conference, Nov. 20–21, 2021, in Beijing, China.
ICSA-Canada Chapter Symposium, Jul. 8–10, 2022, in Banff, Canada. [[Slides](#)]

Conference Poster Presentations

- *Discrepancy-based Inference for Intractable Generative Models using Quasi-Monte Carlo.*
SIAM Annual Meeting, Jul. 19–23, 2021, online. [[Poster](#)]
Paris AI Summer School, Jul. 5–9, 2021, online.

Mentorship

- Vikram Balasubramanian
Directed Reading Program, UPenn, Sep.–Dec., 2022.
- Alexandru Lopotenco
Undergraduate Research in Probability and Statistics, UPenn, Jan.–May., 2022.
- Ryan Jeong
Undergraduate Research in Probability and Statistics, UPenn, Jan.–May., 2022.

Publications and Preprints

- [1] Z. Niu*, J. Meier*¹, and F-X. Briol. Discrepancy-based Inference for Intractable Generative Models using Quasi-Monte Carlo. **Electronic Journal of Statistics**, 2022. Available on [arXiv](#).
- [2] Z. Niu, Y. Gu, W. Li. Estimation and inference for high-dimensional nonparametric additive instrumental-variables regression. Major revision at **Electronic Journal of Statistics**, 2022+. Available on [arXiv](#).
- [3] S. Mukherjee, Z. Niu, S. Halder, B. B. Bhattacharya, G. Michailidis. High Dimensional Logistic Regression Under Network Dependence. To appear at **Journal of Machine Learning Research**, 2022+. Available on [arXiv](#).
- [4] Z. Niu*, A. Chakraborty*, O. Dukes, and E. Katsevich. Reconciling model-X and doubly robust approaches to conditional independence testing. To appear at **Annals of Statistics**. Available on [arXiv](#). [*Lawrence David Brown Best Student Paper Award at Wharton, 2024*]
- [5] Z. Niu, B. B. Bhattacharya. Distribution-free joint independence testing and robust independent component analysis using optimal transport. Major revision at **Journal of the American Statistical Association**, 2022+. Available on [arXiv](#).
- [6] Z. Niu, J. Ray Choudhury, E. Katsevich. The conditional saddlepoint approximation for fast and accurate large-scale hypothesis testing. In submission, 2025+. Available on [arXiv](#).
- [7] A. Chatterjee*, Z. Niu*, B. B. Bhattacharya. A kernel-based conditional two-sample test using nearest neighbors (With applications to calibration, regression curves and simulation-based inference). In submission, 2024. Available on [arXiv](#).
- [8] T. Barry, Z. Niu, E. Katsevich, X. Lin. The permuted score test for robust differential expression analysis. In submission, 2025. Available on [arXiv](#).
- [9] Z. Niu, Z. Ren. Assumption-lean weak limits and tests for two-stage adaptive experiments. In submission, 2025. Available on [arXiv](#). [*Finalist for IISA Student Paper Competition, 2025*]

Last updated: June 27, 2025

¹* stands for equal contribution