

Ziang Niu

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 theory and methodology for testing (conditional) independence and model calibration. I have also been working on more classical topics including *saddlepoint approximation*. See [6, 7, 8].

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, (2020–2021).

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

Fellowship and Awards

- 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*, NeurIPS (1), JMLR (1), JASA (3), Bernoulli (2), JRSS-A (1), EJS(1).
- *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

- *High-dimensional causal inference: estimation and inference for high-dimensional treatment in the presence of unobserved confounding.*
Data Mining Center of Renmin University of China, May. 28, 2021.

Invited Conference Oral Presentations

- *Detect model miscalibration via your nearest neighbor.*
ICSA-Canada Chapter Symposium, June. 7, 2024.

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.
- *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.
- *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.*
Lifting Inference with Kernel Embeddings, Jan. 10-14, 2022, online. [[Video](#)] [[Slides](#)]
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 <https://arxiv.org/abs/2106.11561>.
- [2] **Z. Niu**, Y. Gu, W. Li. Estimation and inference for high-dimensional nonparametric additive instrumental-variables regression. In submission, 2022+. Available on <https://arxiv.org/abs/2204.00111>.
- [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 <https://arxiv.org/abs/2110.03200>.
- [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 <https://arxiv.org/abs/2211.14698>.
- [5] **Z. Niu**, B. B. Bhattacharya. Distribution-free joint independence testing and robust independent component analysis using optimal transport. In submission, 2022+. Available on <https://arxiv.org/abs/2211.15639>.
- [6] **Z. Niu**, J. Ray Choudhury, E. Katsevich. Computationally efficient and statistically accurate conditional independence testing with spaCRT. In submission, 2024. Available on <https://arxiv.org/pdf/2407.08911>.
- [7] **Z. Niu**, J. Ray Choudhury, E. Katsevich. The saddlepoint approximation for averages of conditionally independent random variables. In submission, 2024. Available on <https://arxiv.org/pdf/2407.08915>.
- [8] 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 <https://arxiv.org/pdf/2407.16550>.

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^{1*} stands for equal contribution