Ziang Niu

Third-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.
Thesis Committee Member: Eugene Katsevich, Bhaswar B. Bhattacharya, Zhimei Ren and Nancy Zhang.

University of Pennsylvania (Philadelphia, PA), M.A. in Applied Mathematics, 2023.

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

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.

Professional Service Activities

- *Reviewer*, AoAP, AoS, Bernoulli, JASA, JCGS, JRSS-A, NeurIPS, Statistical Science, TPAMI.
- *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

- *Robust and efficient methods for single-cell CRISPR screens: PerturbPlan and spaCRT* [Slides]
  Statistics seminar at Mathematics and Statistics in McGill University, Apr. 17, 2026.
- *The permuted score test for robust differential expression analysis.* [Slides]
  Department seminar at School of Statistics and Data Science in SUFE, Dec. 31, 2025
- *Assumption-lean weak limits and tests for two-stage adaptive experiments.* [Slides]
  International Seminar on Selective Inference, Jun. 3, 2025.
- *Computationally efficient and statistically accurate conditional independence testing with spaCRT.* [Slides]
  International Seminar on Selective Inference, Nov. 4, 2024.
  Special Statistics and Biostatistics seminar at OSU, Oct. 8, 2025, in Columbus, USA.

Invited Conference Oral Presentations

- *Assumption-lean weak limits and tests for two-stage adaptive experiments.*
  International Indian Statistical Association Conference, Jun. 12, 2025.

Contributed Conference Oral Presentations

- *Detect model miscalibration via your nearest neighbor.* [Slides]
  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.* [Slides]
  Lawrence David Brown student workshop, Mar. 22, 2024, in Philadelphia, USA.
  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.* [Slides]
  Lifting Inference with Kernel Embeddings, Jan. 10–14, 2022, online. [Video]
- *Estimation and inference for high-dimensional nonparametric additive instrumental-variables regression.* [Slides]
  Chinese R Conference, Nov. 20–21, 2021, in Beijing, China.
  ICSA-Canada Chapter Symposium, Jul. 8–10, 2022, in Banff, Canada.

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

† stands for corresponding / senior author; * stands for equal contribution.

[1] **Z. Niu***, J. Meier*, 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. To appear 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. Under 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. Under revision at **Biometrika**, 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. Under revision at **JRSS-B**. Available on arXiv. [*Finalist of Student Paper Competition at International Indian Statistical Association (IISA) Conference, 2025*]

[10] Z. Huang, **Z. Niu**† Semiparametric KSD test: unifying score and distance-based approaches for goodness-of-fit testing. Under review, 2025. Available on arXiv. [*Student Paper Award at International Symposium on Nonparametric Statistics (ISNPS), 2026*]

[11] **Z. Niu**, Yihui He, James Galante, Andreas R. Gschwind, Judhajeet Ray, Lars M. Steinmetz, Jesse M. Engreitz, Eugene Katsevich PerturbPlan: An analytical framework for designing Perturb-seq experiments. Under review at **Nature Methods**, 2026. Available on BioRXiv.

Last updated: June 17, 2026