

Jiaheng Chen

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Education

University of Chicago

Ph.D. Student

Chicago, US

2022 – Now

- Computational and Applied Mathematics
- Advisor: Daniel Sanz-Alonso

Shanghai Jiao Tong University

Undergraduate Student

Shanghai, China

2018 – 2022

- Mathematics and Applied Mathematics, Zhiyuan College

Research Interests

My research lies at the intersection of applied mathematics, statistics, and data science. I am broadly interested in the mathematics of data science and scientific machine learning.

Publications and Preprints

- Convergence rates for learning pseudo-differential operators. With D. Sanz-Alonso.
arXiv: 2601.04473
- High-dimensional quasi-Monte Carlo via combinatorial discrepancy. With H. Jiang and N. Kirk.
arXiv: 2508.18426
- Sharp concentration of simple random tensors II: asymmetry. With D. Sanz-Alonso.
arXiv: 2505.24144
- Optimal estimation of structured covariance operators. With O. Al-Ghattas, D. Sanz-Alonso and N. Waniorek. *arXiv:* 2408.02109
- On the estimation of Gaussian moment tensors. With O. Al-Ghattas and D. Sanz-Alonso. *Electronic Communications in Probability*, 30, 1-15, (2025).
- Sharp concentration of simple random tensors. With O. Al-Ghattas and D. Sanz-Alonso. *Information and Inference: A Journal of the IMA*, 14(4), 1-41, (2025).
- Precision and Cholesky factor estimation for Gaussian processes. With D. Sanz-Alonso. *SIAM/ASA Journal on Uncertainty Quantification*, 13(3), 1085-1115, (2025).
- Covariance operator estimation: sparsity, lengthscale, and ensemble Kalman filters. With O. Al-Ghattas, D. Sanz-Alonso and N. Waniorek. *Bernoulli*, 31(3), 2377-2402, (2025).
- A machine learning framework for geodesics under spherical Wasserstein-Fisher-Rao metric and its application for weighted sample generation. With Y. Jing, L. Li and J. Lu. *Journal of Scientific Computing*, 98(5), 1-34, (2024).
- Fluctuation suppression and enhancement in interacting particle systems. With L. Li. *arXiv:* 2204.07757

Fellowships and Awards

- Travel Award, SIAM Conference on Uncertainty Quantification 2026
- Neubauer Family Distinguished Doctoral Fellowship, University of Chicago 2022 – 2027
- Zhiyuan Outstanding Student Scholarship, Shanghai Jiao Tong University 2022
- Excellent Bachelor's Thesis Award, Shanghai Jiao Tong University 2022
- Shanghai Outstanding Graduate 2022
- Outstanding Winner, SIAM Award, COMAP Scholarship Award Mathematical Contest in Modeling and Interdisciplinary Contest in Modeling 2021
- National Scholarship, Ministry of Education, P.R. China 2020
- Zhiyuan Honors Scholarship, Shanghai Jiao Tong University 2018 – 2022

Teaching

Teaching Assistant at University of Chicago

- STAT/CAAM 31521: Applied Stochastic Processes Spring 2025
- STAT/CAAM 31050: Applied Approximation Theory Spring 2024
- STAT/CAAM 38100: Measure-Theoretic Probability I Winter 2024
- STAT/CAAM 31150: Inverse Problems and Data Assimilation Autumn 2023

Conferences and Seminars

- SIAM Annual Meeting, Cleveland, US July 6 – 10, 2026
Minisymposium: “From Theory to Computation: Modern Methods for PDE Inverse Problems”
- SIAM Conference on Uncertainty Quantification, Minneapolis, US March 22 – 25, 2026
Co-organizing the minisymposium “Recent Advancements in Operator Estimation and Learning”
- Joint Statistical Meetings (JSM), Nashville, US August 2 – 7, 2025
Section: “Functional and Shape-Constrained Data Analysis: Methods and Applications”
- DACO Seminar, Department of Mathematics, ETH Zurich (*Zoom Seminar*) May 22, 2025
- Stat & CAM Student Research Poster Day, University of Chicago May 20, 2025
- Workshop “Statistics Meets Tensors: Methodology, Theory, and Applications”, Institute for Mathematical and Statistical Innovation (IMSI) May 5 – 9, 2025
- Reading Seminar on Stochastic Many-body Systems (*Zoom Seminar*) April 2, 2025
- Workshop “Kernel Methods in Uncertainty Quantification and Experimental Design”, Institute for Mathematical and Statistical Innovation (IMSI) March 31 – April 4, 2025
- Institute of Natural Sciences, Shanghai Jiao Tong University September 1, 2024
- SIAM Conference on Uncertainty Quantification, Trieste, Italy February 27 – March 1, 2024
Minisymposium: “Statistical and Data-Assisted Modeling Approaches for Forecasting and Uncertainty Quantification of Complex Multiscale Systems in Real-World Applications”
- CAM & Statistics Student Seminar, University of Chicago October 10, 2023