Jiaheng Chen

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Education

University of Chicago   Chicago, US
Ph.D. Student   *2022 – Now*

○ Committee on Computational and Applied Mathematics

○ Advisor: Daniel Sanz-Alonso

Shanghai Jiao Tong University   Shanghai, China
Undergraduate Student   *2018 – 2022*

○ Major: Mathematics and Applied Mathematics, Zhiyuan College

○ Minor: Economics, Antai College of Economics and Management

○ GPA ranked 1st

Research Interests

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

Publications and Preprints

○ Convergence rates for learning pseudo-differential operators. With D. Sanz-Alonso.
  In preparation.

○ 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

○ Neubauer Family Distinguished Doctoral Fellowship, University of Chicago	2022 – 2027
○ Zhiyuan Outstanding Student Scholarship, Shanghai Jiao Tong University	2022
○ Excellent Bachelor Thesis, Shanghai Jiao Tong University	2022
○ Shanghai Outstanding Graduate	2022
○ Outstanding Winner, SIAM Award, COMAP Scholarship Award	2021
Mathematical Contest in Modeling and Interdisciplinary Contest in Modeling	
○ National Scholarship, Ministry of Education of P.R.China	2020
○ Undergraduate Excellence Scholarship (First Class), Shanghai Jiao Tong University	2020
○ Zhiyuan Honors Scholarship, Shanghai Jiao Tong University	2018 – 2022
○ China Mathematics Olympiad, Silver Medal	2017

Conferences and Seminars

○ 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

Referee Service

Biostatistics

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