

# Jiaheng Chen | Curriculum Vitae

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## Education

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### University of Chicago

*Ph.D. Student*

Chicago, US

2022 – Now

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

### Shanghai Jiao Tong University

*Undergraduate Student*

Shanghai, China

2018 – 2022

- Major: Mathematics and Applied Mathematics (Honors), Zhiyuan College
- Minor: Economics, Antai College of Economics and Management
- GPA ranked 1st

## Research Interests

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My research lies at the intersection of applied mathematics, statistics, and data science. I am broadly interested in the mathematical foundations of data science and uncertainty quantification. Recent topics of interest include:

- High-dimensional probability and statistics
- Gaussian processes and empirical process theory
- Scientific machine learning
- Discrepancy theory and quasi-Monte Carlo methods

## Publications and Preprints

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- On the estimation of Gaussian moment tensors. With O. Al-Ghattas and D. Sanz-Alonso. *arXiv*: 2507.06166
- Sharp concentration of simple random tensors II: asymmetry. With D. Sanz-Alonso. *arXiv*: 2505.24144
- Sharp concentration of simple random tensors. With O. Al-Ghattas and D. Sanz-Alonso. *arXiv*: 2502.16916
- Optimal estimation of structured covariance operators. With O. Al-Ghattas, D. Sanz-Alonso and N. Waniorek. *arXiv*: 2408.02109
- Precision and Cholesky factor estimation for Gaussian processes. With D. Sanz-Alonso. *SIAM/ASA Journal on Uncertainty Quantification*, to appear, (2025+). *arXiv*: 2412.08820
- 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*, Vol.98, No.5, (2024).
- Fluctuation suppression and enhancement in interacting particle systems. With L. Li. *arXiv*: 2204.07757

## Teaching

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*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

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- 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

## Fellowships and Awards

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- Neubauer Family Distinguished Doctoral Fellowship, University of Chicago 2022 – 2027
- Zhiyuan Outstanding Student Scholarship, Shanghai Jiao Tong University 2022
- Excellent Bachelor Thesis (1%), Shanghai Jiao Tong University 2022
- Outstanding Graduate in Shanghai 2022
- Outstanding Winner (0.1%), 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