Yicheng Shen

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Scientific Interests

Real-world evidence synthesis, comparative effectiveness research, individualized health prediction using observational data, electronic health records and multi-institutional cohorts).

Methodological Interests

Causal inference, (Bayesian) hierarchical modeling, multivariate longitudinal modeling, federated and privacy-preserving learning, (network) meta-analysis.

Education

Johns Hopkins University — Baltimore, MD
Ph.D. in Biostatistics — August 2024 – May 2029
Advisors: Dr. Jiayi (Jessie) Tong & Dr. Elizabeth A. Stuart

Duke University — Durham, NC
M.S. in Statistical Science — August 2022 – May 2024
Advisors: Dr. Hwanhee Hong & Dr. Alexander Volfovsky

Carleton College — Northfield, MN
B.A. in Statistics & Political Science — August 2018 – June 2022
Advisors: Dr. Andrew Poppick & Dr. Greg Marfleet
Graduate with Distinctions & *Magna Cum Laude*

Selected Coursework

Statistics: Bayesian statistics, sampling techniques, time series analysis, predictive modeling, statistical inference, hierarchical modeling, survival analysis, statistical computing, causal inference, probabilistic machine learning, study design, spatio-temporal modeling, high-dimensional statistics.

Mathematics: multivariate calculus, linear algebra, probability, mathematical structure, ordinary differential equations, numerical analysis, computational mathematics, real analysis, measure theoretical probability.

Working Papers & Publications

Shen, Y., Kim, J., Luo, C., Zeger, S. L., Shah, A. A., Tong, J. (2026). MV-PEAL: A Federated Learning Framework for Multivariate Longitudinal EHR Data. [Submitted for the *Annals of Applied Statistics*]

Shen, Y., Kim, J., Luo, C., Zeger, S., Domsic, R. Shah, A., Tong, J. (2026). Unlocking Multi-Institutional Insights into Disease Progression with Federated Learning: PEAL as a Lossless, One-Shot Solution. [In press at *npj Digital Medicine*]

Vazquez, J., **Shen, Y.**, Sanderson, K., Akulian, J., Tong, J., Stuart, E. A.(2026). Federated Learning with Incomplete Data: A Weighted Approach. [Submitted for *Biostatistics*]

Wu, X., **Shen, Y.**, Shan, M., Stuart, E., Lipkovich, I. (2026). Comparing Federated Learning Methods for Estimating Average Treatment Effects in a Target Population from Multiple Real-world Studies and Randomized Trials. [Manuscript in preparation for *Statistics in Medicine*]

Chao, A., **Shen, Y.**, Ghanta, A., Silver, N., Milardo, R., Santos, C., Tong, J. (2025). Sex Differences in Response to Incretin-Based Medications for Obesity: Systematic Review and Meta-Analysis. [Invited Revision at *Obesity Reviews*]

Shen, Y., Chu, H., Hong, H. (2025). Simulation-Based Methods for Power Calculation in Bayesian Network Meta-Analysis. [Invited revision at *Journal of the Royal Statistical Society Series C*]

Shen, Y., Bail, C., & Volfovsky, A. (2026). Enhancing joint ideal point estimation strategies with Twitter social networks and text data. *Network Science*, 14, e10. doi:10.1017/nws.2026.10028

Shen, Y. (2022). Be Steady and Popular: a Modern Counter-Insurgency ABM. *NetLogo Modeling Commons.*

Shen, Y. (2022). Justified Cause? Assessing the Humanitarian Outcomes of US Foreign Aid and Intervention Since the Cold War. *PoliS: Carleton Journal of Political Science*, inaugural edition, pp.129-167.

Shen, Y., Flignor, J., Nachreiner, L., & Wang, K. (2022). Behind the Smoke: An Extreme Value Analysis of Air Pollution in Minnesota. *Consortium for the Advancement of Undergraduate Statistics Education*, spring 2022 issue.

Published Software

Luo, C., Duan, R., ⋯, **Shen, Y.** , Tong, J., & Chen, Y. (2025). PDA: Privacy-Preserving Distributed Algorithms. R Package. https://cran.r-project.org/web/packages/pda/index.html

Shen, Y. (2022). Model of Wheeler. NetLogo Modeling Commons. Northwestern University Center for Connected Learning and Computer-Based Modeling, Evanston. https://modelingcommons.org/account/models/5618

Coauthored Chapter

Knoke, D. (2025). Insurging. In *Network Collective Action: Agent-Based Models of Pandemics, Riots, Social Movements, Insurrections and Insurgencies* (pp. 89-100). Cham: Springer Nature Switzerland.

Honors, Recognition & Funding

ICSA Student Paper Award	2026
AI Research Day Student Award	2026
NSF Travel Award for the ICSA Applied Statistics Symposium	2026
Honorable Mention for the BEST Award for Master's Research	2024
Teaching Assistant of the Year Award	2024
Dean's Research Award for Master's Students (twice)	2022 & 2023
TADA Travel Award	2023

	Duke Career Center Professional Development Fund	2022
	First Prize in Undergraduate Statistics Research Project Competition	2022
	Phi Beta Kappa Society	2022
	Sigma Xi Society	2022
	Distinction on Statistics Senior Thesis	2022
	Distinction on Political Science Senior Thesis	2022
	Dean's Honor List - Top 10% of Class	2021

Teaching Experience

Teaching Assistant (Johns Hopkins University) Aug 2025 – Present
140.751-2: Advanced Methods in Biostatistics
140.778: Statistical Computing, Algorithm, and Software Development
140.779: Advanced Statistical Computing

Teaching Assistant (Duke University) Aug 2023 – May 2024
STA 610: Multilevel and Hierarchical Models
STA 432: Theory and Methods of Statistical Learning and Inference

Teaching Assistant (Carleton College) Sep 2020 – May 2022
STA 320: Time Series Analysis
STA 230: Applied Regression Analysis
STA 220: Introduction to Data Science

Work Experience

Quantitative Resource Center Northfield, MN
Comprehensive Integrative Exercise Consultant Sep 2021 – June 2022

Undergraduate Journal of Humanistic Studies Northfield, MN
Editor of 2020 & 2021 Issues Mar 2021 – June 2022

Minnesota Council of Nonprofits Saint Paul, MN
Legislator Data Analytic Internship Nov 2020 – Dec 2020

Northfield Area Family YMCA Northfield, MN
Statistical Consultant Jan 2021 – Mar 2021

Laurence McKinley Gould Library Northfield, MN
Special Collection and Preservation Assistant Oct 2018 – Apr 2022

Invited Conferences

Joint Statistical Meeting (JSM)	2026
ICSA Applied Statistics Symposium	2026
Eastern North American Region (ENAR) Spring Meeting	2026 2024
Johns Hopkins inHealth Precision Medicine Symposium	2026
PHAISE AI Research Day	2026
Duke Industry Statistics Symposium (DISS)	2026 2024
Duke Research Data Visualization Competition and Showcase	2024
Duke Health Data Science Poster Showcase	2023
New Directions in Analyzing Text as Data (TADA) Conference	2023

	Electronic Undergraduate Statistics Research Conference (eUSR)	2022
	Northfield Undergraduate Mathematics Symposium (NUMS)	2021
	Carleton Undergraduate Research and Internship Symposium	2021

Membership

International Chinese Statistical Association	since 2026
Eastern North American Region of International Biometric Society	since 2023
International Society for Bayesian Analysis	since 2023
American Statistical Association	since 2019

Professional Service & Activities

Reviewer for *Epidemiologic Methods*
Departmental Ph.D. Student Representative
Organizer of Biostatistics Education & Student Training Seminar
Organizer of Johns Hopkins Causal Inference Working Group
Undergraduate Student Departmental Advisor

Skills

Programming
Proficiency in: R, Shiny, Python, MySQL, MATLAB, Mathematica, NetLogo.

Software & Statistical Implementation
Rich experience in GitHub, Quarto, LaTeX & Overleaf, Jupyter Notebook, GWAS with PLINK, coding and operating on server clusters, predictive modeling, hierarchical modeling, agent-based modeling, clustering and classification problems, JAGS, MCMC-related Bayesian sampling and diagnostics.

Personal Interests

Karate, badminton, movies, hiking, volunteer work, book preservation.