Boshi Zhao

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Education

Northern Illinois University, DeKalb, IL — Ph.D. in Mathematical Sciences (Statistics Track)
Dissertation defense scheduled January 2025
GPA: 3.7/4.0

University of Missouri-Columbia, Columbia, MO — M.S. in Economics
GPA: 3.8/4.0

Southwest University of Finance and Economics, Chengdu, China — B.S. in Statistics
GPA: 90/100

Research Interests

Statistical Modeling; Bayesian Methods; Functional Data Analysis; High-Dimensional Data; Machine Learning; Applied Probability; Longitudinal and Complex Data; Health and Social Data Analytics.

Publications and Manuscripts

Peer-Reviewed Publication

- **Zhao, B.**, Saravanan, A., et al. (2025). *Prevalence and Sociodemographic Correlates of Low Back Pain in a Diverse U.S. Population: Insights from the All of Us Research Program.* Pain Management Nursing.

Manuscript Under Review

- **Zhao, B.**, Saravanan, A., et al. *Sociodemographic Patterns and Associations between Perceived Healthcare Discrimination and Pain Severity in the All of Us Research Program.* Under review at The Journal of Pain.

Manuscripts in Preparation

- Expanded analysis incorporating interaction effects using the All of Us cohort.
- Ongoing modeling work on waist circumference and discrimination levels.
- Collaborative genomic analysis project integrating genetic features with socio-demographic predictors (UAB collaboration).

Teaching Experience

Graduate Teaching Assistant, Department of Statistics Northern Illinois University
Aug 2019–Present

- Held weekly office hours, supporting undergraduate courses (STAT 100–STAT 300).
- Tutored students in probability, inference, regression, ANOVA, and computational statistics.
- Provided guidance on coursework and exam preparation.

Recitation Instructor, STAT100 & STAT200 Northern Illinois University
Summer 2022; Fall 2025

- Led problem-solving sessions and reinforced foundational statistical concepts.
- Prepared examples and review materials for exams.

Statistical Consulting Project Manager (Training Role) Northern Illinois University
Jul 2021–Present

- Delivered training on statistical modeling, hypothesis testing, and R coding workflows.
- Explained analytical concepts to technical and nontechnical stakeholders.

Instructor and Tutor, WEducation Online
2022

- Tutored undergraduate and graduate students in statistical analysis and R programming.
- Supported students in data cleaning, visualization, and modeling.

Research and Professional Experience

Data Analyst / Statistical Researcher Northern Illinois University
Aug 2022–Present

- Processed and structured large-scale datasets (300,000+ observations) using SQL, R, and SAS.
- Developed multivariable regression, multinomial models, and generalized modeling pipelines.
- Applied statistical modeling to identify meaningful patterns in complex socio-demographic data.
- Contributed to multiple manuscripts covering regression modeling, interaction effects, and data integration.

Consulting Project Manager Statistical Consulting Program, NIU
Jul 2021–Present

- Collaborated with 15+ clients across healthcare, education, transportation, and commercial sectors.
- Designed and reviewed statistical analysis plans with attention to methodological rigor.
- Communicated analytical results to diverse client groups.

Argonne National Laboratory ALCF Project

- Managed and analyzed over 2,000 HPC user survey responses.
- Conducted exploratory and inferential analyses in Python.
- Performed hypothesis testing using t-tests and ANOVA.

Pace Bus Services Project

- Modeled ridership and operational efficiency using weighted and pooled estimators.
- Automated R-based analysis pipelines, reducing processing time by approximately 40%.

Research Projects

Bayesian Functional Factor Analysis and Principal Component Analysis
2023–Present

- Developed FPCA using variogram-based covariance estimation for improved computational efficiency.
- Built Bayesian functional factor models incorporating temporal structure in prior distributions.

Bayesian PCA/FA for Discrete Time Points
2021–2023

- Designed Bayesian models for high-dimensional discrete-time data.
- Analyzed behavioral interaction datasets using smoothing splines to study temporal dynamics.

Technical Skills

Programming: R, Python, SAS, SQL, Julia, SPSS
Statistics & ML: Bayesian modeling, regression, PCA/FA, functional data analysis, survival analysis, high-dimensional statistics, machine learning
Tools: HPC, Git, ggplot2, Matplotlib
Data: All of Us Research Program, survey data, behavioral time-series data, structured large datasets