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Jiasong Duan

LeConte 227, Department of Statistics, University of South Carolina

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Education

Ph.D. Statistics

August 2021 - Expected June 2026

University of South Carolina, Columbia, SC

advisors: Dr. Xianzheng Huang and Dr. Hongmei Zhang

M.S. Biostatistics

January 2019 - May 2021

University of Memphis, Memphis, TN

advisor: Dr. Hongmei Zhang

B.S. Medical Laboratory Science

September 2014 - July 2018

Kunming Medical University, Kunming, Yunnan, China

Publications

Journal Articles (peer reviewed)

[* indicates co-first authorship]

Zhang, H., **Duan, J.**, Han, L., Alam, N., Ray, M., Yang, F., Jiang, Y., Ewart, S., Holloway, J. W., Karmaus, W., et al. (2025). Dna methylation at birth and ige trajectories from birth to adolescence, different patterns between white and asian. *Epigenomics*, 17(4), 213–222.

Budu-Aggrey, A., ..., **Duan, J.**, ..., & Paternoster, L. (2023). European and multi-ancestry genome-wide association meta-analysis of atopic dermatitis highlights importance of systemic immune regulation. *Nature Communications*, 14(1), 6172.

Han, L., Kaushal, A., Zhang, H., Kadalayil, L., **Duan, J.**, Holloway, J. W., Karmaus, W., Banerjee, P., Tsai, S.-F., Wen, H.-J., Arshad, S. H., & Wang, S.-L. (2021). Dna methylation at birth is associated with childhood serum immunoglobulin e levels. *Epigenetics Insights*, 14, 25168657211008108.

Rathod, R., Rathod, A., Rahimabad, P. K., **Duan, J.**, Zhang, H., Arshad, S. H., & Karmaus, W. (2021). Methylation of host genes associated with coronavirus infection from birth to 26 years. *Genes*, 12(8), 1198.

Rathod*, A., **Duan***, J., Zhang, H., Holloway, J. W., Ewart, S., Arshad, S. H., & Karmaus, W. (2020). Interweaving between genetic and epigenetic studies on childhood asthma. *Epigenetics insights*, 13, 2516865720923395.

Yu, X., **Duan, J.**, Jiang, Y., & Zhang, H. (2020). Distinctive trajectories of the covid-19 epidemic by age and gender: A retrospective modeling of the epidemic in south korea. *International Journal of Infectious Diseases*, 98, 200–205.

Submitted

Duan, J., Zhang, H., & Huang, X. (2025). Testing-driven variable selection in bayesian modal regression [Manuscript under review at *Statistics in Medicine*]. *arXiv preprint arXiv:2510.23831*. <https://arxiv.org/abs/2510.23831>

In preparation

Duan, J., Huang, X., & Zhang, H. (in preparation). Estimation of undirected networks under non-gaussianity.

Duan, J., & Huang, X. (in preparation). Estimating dynamic correlation of zero-inflated bivariate count data with correction of measurement error.

Dissertation and Thesis

Duan, J. (2026 expected). Variable selection and network analysis for non-gaussian data.

Duan, J. (2021). Variable selection and subsequent case prediction in semi-parametric models. *Electronic Theses and Dissertations*, 2164. <https://digitalcommons.memphis.edu/etd/2164/>.

Research Grant

Title: Network differentiation using non-Gaussian data with causal discovery

- PI: Jiasong Duan
- Funding Source: SPARC Graduate Research Grant Program, University of South Carolina
- Amount funded: \$4,992
- Duration: 05/2025 - 04/2026

Research and Teaching Experience

Graduate Researcher, Department of Statistics
University of South Carolina, Columbia, SC

August 2021 - present

- **Network Differentiation Using non-Gaussian Data with Applications in Causal Discovery**
Proposed novel methods for inferring graphical models, conducting network differential analysis, and performing causal discovery, all using non-Gaussian data.
- **Variable Selection with Heavy-tailed and Skewed Data**
Developed an effective variable selection method under Bayesian framework for heavy-tailed and skewed response data, providing robustness to non-Gaussian distributions.
- **Estimating Dynamic Correlation of Zero-inflated Bivariate Count Data Subject to Measurement Error**
Developed a statistical model for analyzing dynamic correlations in gene expression data, particularly in the context of single-cell RNA sequencing that produces data prone to measurement error.
- **The Causal inference between Income and Work Stress**
Conducted structural causal models to examine the cause-and-effect relationships between income and work stress in a population of nurses.
- **Comparison between Parametric and Nonparametric Quantile Regression Methods**
Assessed the performance of nonparametric regression methods commonly used in modern machine learning in comparison with traditional parametric regression methods for predicting conditional quantiles.
- **Comparison between Global and Local Approximations for Gaussian Processes**
Evaluated diverse representative Gaussian Processes approximation methods routinely used in machine learning for handling large datasets, and assessed their relative effectiveness.

Graduate Teaching Assistant, Department of Statistics
University of South Carolina, Columbia, SC

August 2021 - present

- STAT 201 - Elementary statistics
Role: **Lecture Instructor**
Duties: Prepared course materials, gave lectures, held office hours, wrote and graded exams
Student evaluation for instructor: 4.60/5 (from 46 of 67 students) in Fall 2023, 4.49/5 (from 30 of 61 students) in Spring 2024, 4.63/5 (from 46 of 61 students) in Fall 2024, 4.62/5 (from 45 of 60 students) in Spring 2025
Fall 2023, Spring 2024, Fall 2024, Spring 2025, Fall 2025
- STAT 201 - Elementary statistics
Role: **Lab Instructor**
Duties: Delivered lab lectures, led lab discussions, and graded lab reports
Student evaluation for instructor: 2.88/3 (from 42 of 68 students)
Spring 2023
- STAT 515 - Statistical Methods I
Role: **Teaching Assistant**
Duties: Held office hours, graded assignments and exams
Fall 2022
- STAT 540 - Computing in Statistics
Role: **Teaching Assistant**
Duties: Graded assignments, and assisted with course management in Blackboard
Spring 2022
- STAT 509 - Statistics for Engineers
Role: **Teaching Assistant**
Duties: Held office hours, answered questions via email, managed online discussion section, graded exams
Fall 2021

Graduate Research Assistant, School of Public Health
University of Memphis, Memphis, TN

July 2019 - May 2021

- **Variable Selection and Case Prediction in Semi-parametric Models**
Developed a semi-parametric Bayesian variable selection approach and compared with machine learning methods (random forest, SVM, logistic regression).
- **Pre-processing of RNA-sequencing data**
Performed pre-processing of RNA-seq data in FASTQ and BAM formats, including procedures of alignment, normalization, annotation, and quality control.
- **An Assessment of a Novel Clustering Approach Applied to Multi-dimensional Data**
Assisted with developing an innovative clustering method to analyze genomics data at a large scale, and explored the underlying functional organization of genes via clustering analysis.
- **Collaborative Research in Public Health**
Contributed to multiple interdisciplinary studies, including genomic investigations of asthma and eczema, and epidemiological analyses of COVID-19.

Fellowships and Honors

Award	Institution/Organization	Year(s)
University-wide Graduate Student Teaching Award Winner	University of South Carolina, Columbia, SC	2024
Outstanding Graduate Assistant Award – as a lecture instructor	Department of Statistics, University of South Carolina	2024
Outstanding Graduate Assistant Award – as a teaching assistant	Department of Statistics, University of South Carolina	2022
Student Achievement Award	School of Public Health, University of Memphis	2020

Membership

American Statistical Association (ASA)	2023 - present
Eastern North American Region International Biometric Society (ENAR)	2023 - present
Institute of Mathematical Statistics (IMS)	2022 - present
Tennessee Public Health Association (TPHA)	2020 - 2022

Research Interests

High-dimensional data analysis, network analysis, causal inference, statistical machine learning, Bayesian and frequentist statistics, biostatistics, and applications to genomics.

Professional Presentations

Duan, J., Huang, X., Zhang, H. Network Inference for non-Gaussian Data. 2025 Joint Statistical Meetings (JSM), Nashville, TN August 2025	
Duan, J., Huang, X., Zhang, H. Variable Selection with Heavy-tailed Data. Annual Research Symposium, American Statistical Association (SC-ASA), Columbia, SC	April 2024
Duan, J., Huang, X., Zhang, H. Bayesian Variable Selection based on Modal Regression. Eastern North American Region International Biometric Society (ENAR), Baltimore, MD	March 2024
Zhang, H., Duan, J., Han, L., Alam, N., Yang, F., Ewart, S., Holloway, J. W., Karmaus, W., Wang, S., Arshad, S. H. DNA Methylation at Birth and IgE Trajectories through Childhood. American Academy of Allergy, Asthma & Immunology (AAAAI), Washington, DC	February 2024
Duan, J., Zhang, H. an Assessment of a Novel Clustering Approach Applied to Multidimensional Data. Memphis Data Summit, Memphis, TN	March 2021
Duan, J., Zhang, H. Predicting Spreading Pattern of COVID-19. Division of Epidemiology, Biostatistics, and Environmental Health Colloquium, University of Memphis	March 2020
Rathod, A., Duan, J., Zhang, H., Holloway, J. W., Ewart, S., Arshad, S. H., Karmaus, W. Interweaving between Genetic and Epigenetic Studies on Asthma. European Academy of Allergy & Clinical Immunology (EAACI), online	2020

Programming Skills

R, Python, SAS

Scholar Profile

Google Scholar
GitHub repository
Personal website