Leo Li Duan

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Professional Experience

Assistant Professor 2018 – Present
Department of Statistics, University of Florida *Gainesville, FL, USA*

Affiliate Faculty 2021 – Present
McKnight Brain Institute *Gainesville, FL, USA*

Postdoctoral Fellow 2016 – 2018
Johns Hopkins University & Duke University *Baltimore, MD & Durham, NC, USA*

Data Scientist 2015 – 2016
Civitas Learning, LLC *Austin, TX, USA*

Biostatistician 2012 – 2015
Cincinnati Children's Hospital Medical Center *Cincinnati, OH, USA*

Education

PhD in Mathematics 2011 - 2015
University of Cincinnati, Cincinnati, OH

Bachelor of Science with Honors 2005 - 2009
Sichuan University, Chengdu, China

Publications (†: Graduate Student Advised)

Manuscripts under review

- Yu Zheng†, Leo L Duan, and Arkaprava Roy. Consistency of Graphical Model-based Clustering: Robust Clustering using Bayesian Spanning Forest. *arXiv preprint arXiv:2409.19129, under review at Annals of Statistics*, September 2024.
- Yu Zheng† and Leo L Duan. Gibbs Sampling Using Anti-Correlation Gaussian Data Augmentation, With Applications to L1-Ball-Type Models. *arXiv preprint arXiv:2309.09371, under review at Journal of Computational and Graphical Statistics*, June 2024.
- Edric Tam†, David B Dunson, and Leo L Duan. Exact Sampling of Spanning Trees via Fast-Forwarded Random Walks. *arXiv preprint arXiv:2405.03096, under review at Biometrika*, May 2024.
- Cheng Zeng†, Eleni Dilma†, Jason Xu, and Leo L Duan. The Bridged Posterior: Optimization, Profile Likelihood and a New Approach to Generalized Bayes. *arXiv preprint arXiv:2403.00968, under review at Journal of the American Statistical Association*, March 2024.
- Leo L Duan and Anirban Bhattacharya. Graph-Accelerated Markov Chain Monte Carlo Using Approximate Samples. *arXiv preprint arXiv:2401.14186, under review at Journal of Machine Learning Research*, January 2024.

Published

- Leo L Duan and Arkaprava Roy. Spectral Clustering, Spanning Forest, and Bayesian Forest Process. *Journal of the American Statistical Association*, 119(547):2140–2153, August 2024.
- Jinpeng Wang, Yujie Hu, Leo L Duan, and George Michailidis. Analysing and Visualising Mobility Vulnerability and Recovery Across Florida Neighbourhoods: A Case Study of Hurricane Ian. *Regional Studies, Regional Science*, 11(1):384–386, July 2024.

- Zeyu He, Yujie Hu, Leo L Duan, and George Michailidis. Returners and Explorers Dichotomy in the Face of Natural Hazards. *Scientific Reports*, 14(1):13184, June 2024.
- Maoran Xu†, Hua Zhou, Yujie Hu, and Leo L Duan. Bayesian Inference using the Proximal Mapping: Uncertainty Quantification under Varying Dimensionality. *Journal of the American Statistical Association*, 119(547):1847–1858, 2024.
- Leo L Duan and David B Dunson. Bayesian Spanning Tree: Estimating the Backbone of the Dependence Graph. *Journal of Machine Learning Research*, 24(397):1–44, December 2023.
- Leo L Duan, Zeyu Yuwen†, George Michailidis, and Zhengwu Zhang. Low Tree-Rank Bayesian Vector Autoregression Models. *Journal of Machine Learning Research*, 24(286):1–35, October 2023.
- Maoran Xu† and Leo L Duan. Bayesian Inference with the L1-ball Prior: Solving Combinatorial Problems with Exact Zeros. *Journal of the Royal Statistical Society Series B (Statistical Methodology)*, 85(5):1538–1560, July 2023.
- Cheng Zeng†, Jeffrey Miller, and Leo L Duan. Quasi-Bernoulli Stick-Breaking: Infinite Mixture With Cluster Consistency. *Journal of Machine Learning Research*, 24:1–32, May 2023.
- Leo L Duan, George Michailidis, and Mingzhou Ding. Bayesian Spiked Laplacian Graphs. *Journal of Machine Learning Research*, 23:1–35, November 2022.
- Alexandra Badea, Jacques A Stout, Robert J Anderson, Gary P Cofer, Leo L Duan, and Joshua T Vogelstein. Imaging Biomarkers for Alzheimer's Disease Using Magnetic Resonance Microscopy. *Magnetic Resonance Microscopy: Instrumentation and Applications in Engineering, Life Science, and Energy Research*, August 2022.
- Leo L Duan. Transport Monte Carlo: High-Accuracy Posterior Approximation via Random Transport. *Journal of the American Statistical Association*, 118(543):1659–1670, January 2022.
- Leo L Duan and David B Dunson. Bayesian Distance Clustering. *Journal of Machine Learning Research*, 22(224):1–27, August 2021.
- Rhonda D Szczesniak, Teresa Pestian, Leo L Duan, Dan Li, Sophia Stamper, Brycen Ferrara, Elizabeth Kramer, John P Clancy, and Daniel Grossoehme. Data Driven Decision Making to Characterize Clinical Personas of Parents of Children With Cystic Fibrosis: A Mixed Methods Study. *BMC Pulmonary Medicine*, 20(1):1–14, June 2020.
- Leo L Duan, Alex Young, Akihiko Nishimura, and David B. Dunson. Bayesian Constraint Relaxation. *Biometrika*, 107(1):191–204, March 2020.
- Leo L Duan. Latent Simplex Position Model: High Dimensional Multi-view Clustering with Uncertainty Quantification. *Journal of Machine Learning Research*, 21(38):1–25, January 2020.
- Gleb Tikhonov, Leo L Duan, Nerea Abrego, Graeme Newell, Matt White, David Dunson, and Otso Ovaskainen. Computationally Efficient Joint Species Distribution Modeling of Big Spatial Data. *Ecology*, 101(2):e02929, November 2019.
- Leo L Duan, James E Johndrow, and David B Dunson. Scaling Up Data Augmentation MCMC via Calibration. *Journal of Machine Learning Research*, 19(1):2575–2608, October 2018.
- Leo L Duan, Xia Wang, John P Clancy, and Rhonda D Szczesniak. Joint Hierarchical Gaussian Process Model With Application to Personalized Prediction in Medical Monitoring. *Stat*, 7(1):e178, March 2018.
- Leo L Duan, Rhonda D Szczesniak, and Xia Wang. Functional Inverted-Wishart for Bayesian Multivariate Spatial Modeling with Application to Regional Climatology Model Data. *Environmetrics*, 28(7), September 2017.
- Judith W Dexheimer, Eric S Kirkendall, Michal Kouril, Philip A Hagedorn, Thomas Minich, Leo L Duan, Monifa Mahdi, Rhonda D Szczesniak, and S Andrew Spooner. The Effects of Medication Alerts on Prescriber Response in a Pediatric Hospital. *Applied Clinical Informatics*, 8(2):491–501, August 2017.

- Otso Ovaskainen, Gleb Tikhonov, Anna Norberg, F. Guillaume Blanchet, Leo L Duan, David B. Dunson, Tomas Roslin, and Nerea Abrego. How to Make More Out of Community Data? A Conceptual Framework and Its Implementation as Models and Software. *Ecology Letters*, 20(5):561–576, August 2017.
- Rhonda D Szczesniak, Dan Li, Leo L Duan, Mekibib Altaye, Menachem Miodovnik, and Jane C Khoury. Longitudinal Patterns of Glycemic Control and Blood Pressure in Pregnant Women with Type 1 Diabetes Mellitus: Phenotypes From Functional Data Analysis. *American Journal of Perinatology*, 33(13):1282–1290, November 2016.
- Leo L Duan, John P Clancy, and Rhonda D Szczesniak. Bayesian Ensemble Trees for Clustering and Prediction in Heterogeneous Data. *Journal of Computational and Graphical Statistics*, 25(3):748–761, August 2016.
- Kavitha Kotha, Rhonda D Szczesniak, Anjaparavanda P Naren, Matthew C Fenchel, Leo L Duan, Gary L McPhail, and John P Clancy. Concentration of Fractional Excretion of Nitric Oxide: A Potential Airway Biomarker of Restored CFTR Function. *Journal of Cystic Fibrosis*, 14(6):733–740, June 2015.
- Rhonda D Szczesniak, Gary L. McPhail, Leo L Duan, Maurizio Macaluso, Raouf S Amin, and John P Clancy. A Semiparametric Approach to Estimate Rapid Lung Function Decline in Cystic Fibrosis. *Annals of Epidemiology*, 23(12):771–777, August 2013.

Funding & Support

National Science Foundation DMS-ATD (PI) 2023 – 2026
Geospatial Modeling and Risk Mitigation for Human Movement Dynamics under Hurricane Threats

UFII SEED Funding Award (PI) 2022 – 2023
Using High-resolution fMRI Data to Learn the Backbone Functional Connectivity of the Human Brain

UF Junior Faculty Start-up Fund 2018 – 2021

Awards & Honors

UF CLAS College Fellowship 2024

UF CLAS College Faculty Travel Award 2022

UF Statistics Faculty Award 2021

NeurIPS Bayesian Nonparametrics Award 2018

Objective Bayes Travel Award 2017

ASA Paper Competition Award in Section on Bayesian Statistical Science 2015

Woodside Foundation Award for Contribution in Biostatistics and Epidemiology Research 2014

Invited Talks (2018 – Present)

High-dimensional clustering using continuous mixture — *Joint Statistical Meetings, 2024*

High-dimensional clustering using continuous mixture — *International Symposium on Nonparametric Statistics, 2024*

Bridged posterior — *Seminar at Duke University, 2024*

Bridged posterior — *Seminar at University of Washington , 2023*

Model-based spectral clustering — *Seminar at Harvard University, 2023*

Spectral clustering, spanning forest, and Bayesian forest process	*Seminar at Texas A&M University, 2023*
Bayesian forest process	*International Conference on Bayesian Nonparametrics, 2022*
Detection limit theory for L1-ball model	*International Society for Bayesian Analysis World Meetings, 2022*
Bayesian VAR with tree-rank prior	*CMStatistics, 2021*
Bayesian inference with proximal mapping	*International Society for Bayesian Analysis World Meetings, 2021*
Application of tree-rank prior to fMRI data analysis	*Statistical Methods in Imaging Conference, 2021*
Bayesian modeling with L1-ball priors	*Joint Statistical Meetings, 2021*
Transport Monte Carlo	*Joint Statistical Meetings, 2020*
Transport Monte Carlo	*Seminar at University of Massachusetts at Amherst, 2020*
Latent simplex position model	*CMStatistics, 2019*
Bayesian nonparametrics on spectral graph statistics	*New England Statistics Symposium, 2019*
Latent simplex position model	*Seminar at Department of Biostatistics at University of Florida, 2019*
Spiked Laplacian graphs	*Seminar at Duke University, 2019*
Generalized distribution-based clustering (selected for talk)	*NeurIPS Workshop on Bayesian Nonparametrics, 2018*

Services to the Science Community

Associate Editor of Data Science in Science	2022 – Present
Organizing Committee for University of Florida Winter Workshop	2025
Scientific Committee for International Chinese Statistical Association	2022
Scientific Committee for University of Florida Winter Workshop	2021
Student Paper Committee, ASA Section on Statistical Learning and Data Science	2021
Student Paper Committee, ASA Section on the Bayesian Statistical Science	2017
Reviewer for *AISTAT, Applied Network Science, Bayesian Analysis, Bernoulli, Biometrics, Journal of Computational and Graphical Statistics, Journal of Machine Learning Research, Journal of the American Statistical Association, NeurIPS, Statistics in Medicine, Statistical Sinica*	2011 – Present

Mentored Doctoral Students

Yu Zheng
2022 – Present
Yaozhi Yang
2022 – Present
Zeyu Yuwen
2021 – Present, Co-advised with George Michailidis, Expected to graduate in 2024
Cheng Zeng
2019 – Present, Expected to graduate in 2024
Eleni Dilma
2020 – 2024, Co-advised with Brenda Betancourt, Graduated, Placement: U.S. Food and Drug Administration
Maoran Xu
2018 – 2022, Graduated, Placement: Assistant Professor in Indiana University Bloomington