

Yu “Hugh” ZHENG

352-328-4299 | seanzhengyu1@gmail.com | Gainesville, FL, 32608
[LinkedIn](#) | [Github](#) | [Personal Website](#)

EDUCATION

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|---|---|
| University of Florida <i>Ph.D. in Statistics (Expected to graduate in 2025)</i> <ul style="list-style-type: none">• Advisor: Leo L. Duan• GPA: 3.95 / 4 (Rank: 1 / 11) | Gainesville, FL <i>Aug. 2021 - present</i> |
| University of Science and Technology of China (Gifted Young Program) <i>Bachelor of Science, Mathematics and Applied Mathematics</i> <i>Minor in Business Administration</i> | Hefei, CN <i>Aug. 2016 - May. 2020</i> |

AWARDS

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| Mendenhall Award for the top performing first-year student at UF Statistics <i>University of Florida</i> | Gainesville, FL <i>Jan. 2023</i> |
| Katzoff Fellowship Award <i>University of Florida</i> | Gainesville, FL <i>Jun. 2023</i> |

WORK EXPERIENCE

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| Quantitative Research Intern at Susquehanna International Group, LLP <ul style="list-style-type: none">• Conducted in-depth quantitative analysis to develop high-performing features and build profitable trading strategies based on Python, achieving a top-three ranking in single runs during the blast competition of interns.• Gained experience with financial instruments, market structures, equity options trading, machine learning models, and the application of quantitative methods in financial markets. | Jun. 2024 - Aug. 2024 |
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PUBLICATIONS

- Yu Zheng**, Malay Ghosh, and Leo L. Duan. (2024+). Bayesian Analysis of Combinatorial Response Data – 30 Years after Albert and Chib. *Manuscript in preparation*.
- Yu Zheng**, Zhengwu Zhang, and Leo L. Duan. (2024+). Convex and Decomposition-free Estimation of Permutably Block-diagonal Matrix. *Manuscript in preparation*.
- Yu Zheng**, Leo L. Duan, and Arkaprava Roy. (2024). Consistency of Graphical Model-based Clustering: Robust Clustering using Bayesian Spanning Forest. [arXiv](#), under review at *Annals of Statistics*, September 2024.
- Yu Zheng**, and Leo L. Duan. (2023). Blocked Gibbs Sampler with Anti-correlation Gaussian Data Augmentation, with Applications to L1-ball-type Models. [arXiv](#), under review at *Journal of Computational and Graphical Statistics*, June 2024.

RESEARCH PROJECTS

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| Decomposition-free Estimation of Block-diagonal Matrix <ul style="list-style-type: none">• Developed a novel algorithm using projected gradient descent to estimate permutably block-diagonal matrices by solving for a reduced-rank Laplacian matrix, which effectively represents a permutation-similar block-diagonal structure.• Proved the algorithm’s fast convergence rate and demonstrated its scalability in Python, successfully clustering a network dataset with millions of nodes. | Jun. 2024 - Present |
| Clustering Consistency with Forest Process as the Pseudo Posterior <ul style="list-style-type: none">• Developed theories of Bayesian clustering consistency with the forest process model as the pseudo-posterior, demonstrating a feasible approach to bypassing the need for a completely correct specification of the mixture component distribution.• Extended traditional research by proving posterior consistency not only for the number of clusters but also for partitions, significantly broadening the applicability of the forest process model in clustering analysis.• Developed a new mathematical technique called <i>refinement</i>, offering a novel tool for the theoretical development of asymptotics in Bayesian clustering analysis, with potential implications for large-scale data clustering in financial and other applied settings. | Aug. 2023 - Sep. 2024 |
| Anti-correlation Gaussian Data Augmentation (Github link) <ul style="list-style-type: none">• Proposed an innovative data augmentation algorithm in the L1-ball-type model, achieving a 30-fold increase in the effective sample size per computing time. | Jan. 2023 - Jul. 2023 |

- Proved the geometric ergodicity of the proposed Gibbs sampler, the first such proof for models with a spike-and-slab-type prior, which has broad implications for improving the efficiency of Bayesian inference in high-dimensional spaces.
- Implemented the algorithm using R and Python, integrating the Gibbs sampler with applications in both computational statistics and quantitative finance.

Neural Network for Alzheimer's Disease Diagnosis ([Github link](#))

May 2022 - Dec 2022

- Developed a novel neural network architecture combining Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), and Variational Autoencoders (VAEs) with Bayesian modeling for fMRI-based diagnosis of Alzheimer's disease.
- Improved model interpretability and accuracy by incorporating Bayesian uncertainty estimates, providing a potential framework for use in other medical imaging and financial predictive models.

TEACHING EXPERIENCE

Instructor at the University of Florida

Jan. 2023 - Apr. 2023

- STA 3024: Introduction to Statistics II ([Course material](#))
- Held lectures that help 100+ students make progress in utilizing statistical tools (such as ANOVA, nonparametric methods, contingency tables, and linear and logistic regression) to analyze and quantify real-world problems.

Teaching Assistant at the University of Florida

Aug. 2021 - Dec. 2022

- STA 6275: Optimization; STA 6166: Statistical Methods in Research I; STA 3032: Engineer Statistics.

Teaching Assistant at the University of Science and Technology of China

Aug. 2018 - May. 2020

- Mathematical Statistics; Mathematical Analysis B1; Mathematical Analysis B2; Multivariate Calculus.

CONTRIBUTED PRESENTATIONS

2023 Joint Statistical Meetings — *Toronto, Canada*

Aug. 2023

- Talk title: Blocked Gibbs Sampling for L1-ball Priors: an Efficient Computation for Structured Sparse Models.

2024 Theory and Foundations of Statistics in the Era of Big Data — *Tallahassee, Florida*

Apr. 2024

- Gibbs Sampling using Anti-correlation Gaussian Data Augmentation, with Applications to L1-ball-type Models.

REFERENCES

Dr. Leo L. Duan

- Assistant Professor, Department of Statistics, University of Florida
- Phone: 352-294-1827
- Email: li.duan@ufl.edu

Dr. Malay Ghosh

- Distinguished Professor, Department of Statistics, University of Florida
- Phone: 352-273-2992
- Email: ghoshm@stat.ufl.edu

Dr. Arkaprava Roy

- Assistant Professor, Department of Biostatistics, University of Florida
- Phone: 352-294-5924
- Email: arkaprava.roy@ufl.edu

Dr. Georgia Papadogeorgou

- Assistant Professor, Department of Statistics, University of Florida
- Phone: 352-273-4908
- Email: gpapadogeorgou@ufl.edu