

Difan SONG

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<https://difansong.github.io/>

Education

Postdoctoral Fellow in Statistics

2026.07 - Present

Harvard University

Advisor: [Susan A. Murphy](#)

Education

Ph.D. in Industrial Engineering (with Specialization in Statistics)

2021.08 - 2026.06

Minor in Operations Research

Georgia Institute of Technology

Dissertation title: “Novel Design and Surrogate Modeling Methods for Physical and Computer Experiments”

Advisors: [C.F. Jeff Wu](#), [V. Roshan Joseph](#)

M.S. in Finance

2019.09 - 2021.06

Shanghai Advanced Institute of Finance, Shanghai Jiao Tong University

Thesis title: “Are Macroeconomic Factors Useful? A Test with the Double Machine Learning Method”

Advisor: [David Xianglin Li](#)

B.A. in Finance

2015.09 - 2019.06

Fudan University

Teaching

Guest Lecturer

- Advanced Design of Experiments (Graduate level), Fall 2025, H. Milton Stewart School of Industrial and Systems Engineering.

Teaching Assistant

- Design and Analysis of Experiments (Graduate level), Georgia Tech Shenzhen Institute, Spring 2024.
- Theoretical Statistics (Graduate level), H. Milton Stewart School of Industrial and Systems Engineering, Fall 2023.
- Analysis of Big data and Design of Experiments (MBA course), Fall 2020, Shanghai Advanced Institute of Technology, Shanghai Jiao Tong University, Fall 2020.

Publications

Peer-reviewed

1. **Song, D.**, Lewis, W., Knapp, P.F., Wu, C.F.J., Joseph, V.R. (2025). Efficient Optimization of Plasma Radiation Detector Configurations using Imperfect Inference Models. *Journal of the American Statistical Association*, 121 (553), 163-171.
2. **Song, D.**, and Joseph, V. R. (2025). Efficient Active Learning Strategies for Computer Experiments. *Technometrics*, 68 (1), 65–78.
3. **Song, D.**, He, L., Li, W., and Yang, M. (2024). A Systematic View of Information-based Optimal Subdata Selection: Algorithm Development, Performance Evaluation, and Application in Financial Data. *Statistica Sinica*, 34, 611-636.

4. **Song, D.**, Mak, S., and Wu, C.F.J. (2023). ACE: Active Learning for Causal Inference with Expensive Experiments. In *KDD Workshop 2023: Causal Inference and Machine Learning in Practice: Use cases for Product, Brand, Policy, and beyond*. <https://arxiv.org/abs/2306.07480>

Submitted

5. **Song, D.**, and Joseph, V. R. (2026+). Rational Quadratic Kriging. Under review. Manuscript available upon request.
6. **Song, D.**, and Joseph, V. R. (2026+). Efficient Screening Designs for Expensive Black-box Models with Qualitative and Quantitative Factors. Under review. Manuscript available upon request.

Working Papers

6. Li, X., **Song, D.**, Han, M., Zhang, Y., and Kizilcec, R. F. (2021). On the Limits of Algorithmic Prediction Across the Globe. *arXiv preprint arXiv:2103.15212*. <https://arxiv.org/abs/2103.15212>

Honors and Awards

Fellowships and Scholarships

- Kerry Clayton Fellowship, Georgia Institute of Technology, 2021.08 - 2022.05.
- Tang Lixin Scholarship, Shanghai Jiao Tong University, 2021.05.

Papers and Posters

- Best poster, Georgia Statistics Day 2025, 2025.10.
- ASA SPES-Q&P Student Paper Competition winner, 2025 Joint Statistical Meetings (JSM), 2025.08.
- Best poster, 2024 Symposium on Digital Twins and Uncertainty Quantification, 2024.08.
- Best poster: Design Theory, Design and Analysis of Experiments (DAE) 2024, 2024.05.

Others

- 2026 National Institute of Statistical Sciences (NISS) New Researcher Award, 2026.05.
- Outstanding Graduate Award, Shanghai Municipal Education Commission, 2021.06.
- Best Master's Thesis, Shanghai Advanced Institute of Finance, 2021.06.

Presentations

Efficient Active Learning for Computer Experiments

- IMS/ASA Spring Research Conference 2026. Clemson, SC, 2026.05.
- 2025 INFORMS Annual Meeting. Atlanta, GA, 2025.10.
- 2025 Joint Statistical Meetings. Nashville, TN, 2025.08.
- IMS/ASA Spring Research Conference 2025. New York, NY, 2025.06.
- (Poster) 2025 GT Manufacturing 4.0 Consortium, Atlanta, GA, 2025.01.
- 2024 INFORMS Annual Meeting. Seattle, WA, 2024.10.
- Academic of Mathematics and Systems Science, Chinese Academy of Sciences. Beijing, China, 2024.08.
- (Poster) Design and Analysis of Experiments 2024. Virginia Tech, Blacksburg, VA, 2024.05.

Screening Designs for Qualitative and Quantitative Factors

- The Design and Analysis of Experiments Conference 2026. New Brunswick, NJ, 2026.05.
- Academic of Mathematics and Systems Science, Chinese Academy of Sciences. Beijing, China, 2025.12.

Optimization of Plasma Radiation Detectors

- 2026 SIAM Conference on Uncertainty Quantification. Minneapolis, MN, 2026.03.
- (Poster) Georgia Statistics Day 2025. Athens, GA, 2025.10.
- (Poster) 2025 INFORMS Annual Meeting. Atlanta, GA, 2025.10.
- 2025 Joint Statistical Meetings. Nashville, TN, 2025.08.

Active Learning for Causal Inference of Expensive Experiments

- 2023 INFORMS Annual Meeting. Phoenix, AZ, 2023.10.
- 2023 Joint Statistical Meetings. Toronto, Canada, 2023.08.
- The 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining. Long Beach, CA, 2023.08.

A Systematic View of Information-based Optimal Subdata Selection

- Georgia Statistics Day 2022. Athens, GA, 2022.10.
- Duke University, Durham, NC, 2022.10.

Software Contributions

R Packages

- *RQK* ver.1.0.0. Song, D. (maintainer), and Joseph, V. R.
- *MOFAT* ver.2.0. Song, D. (maintainer), Yu, W., Xiao, Q., and Joseph, V. R.
- *rkriging* ver.1.1.0. Huang, C., Song, D. (maintainer), and Joseph, V. R.

Mentorship

BS Students

- Aryan Bolakond, GT ISyE: Design-based improvements of the twinGP framework. 2026.05 - 2026.07

Grants

Contributions

- NSF-DMS proposal on AuRA: An Autonomous Research Assistant for Developing Statistical Methodologies.
PI: V. Roshan Joseph.

Internship Experience

ByteDance

Data scientist, experimental platform 2024.07 - 2024.09

Machine learning engineer, TikTok Shop 2024.05 - 2024.07

Trustbridge Partners 2018.09 - 2018.12

China Financial Futures Exchange (CFFEX) 2018.06 - 2018.08

KPMG 2018.01 - 2018.02

Guotai Junan Asset Management 2017.07 - 2017.08

Professional Services

Session chair

- “Scalable Statistical Inference”, IMS/ASA Spring Research Conference 2026.

Journal reviews: Technometrics, IISE Transactions, Data Science in Science, INFORMS Journal on Data Science, Journal of Biopharmaceutical Statistics.

Professional Affiliations

- American Statistical Association (ASA)
- Society for Industrial and Applied Mathematics (SIAM)
- The Institute for Operations Research and the Management Sciences (INFORMS)
- Institute of Industrial and Systems Engineers (IISE)

References

Dr. Chien-Fu Jeff Wu, X.Q. Deng Presidential Chair Professor

School of Data Science, The Chinese University of Hong Kong, Shenzhen

jeffwu@cuhk.edu.cn

Dr. V. Roshan Joseph, A. Russell Chandler III Chair and Professor

H. Milton Stewart School of Industrial and Systems Engineering, Georgia Institute of Technology

roshan@gatech.edu

Dr. Simon Mak, Assistant Professor

Department of Statistical Science, Duke University

sm769@duke.edu

Dr. William E. Lewis, Principal Member of the Technical Staff

Sandia National Laboratories

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