RUHUI JIN

Department of Applied Mathematics and Statistics ⋄ Johns Hopkins University
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EMPLOYMENT

Rufus Isaacs Postdoctoral Fellow 2025 - present
Johns Hopkins University

Semester Postdoctoral Fellow Jan - April 2026
ICERM, Brown University

Van Vleck Visiting Assistant Professor,
IFDS postdoctoral affiliate 2022 - 2025
University of Wisconsin-Madison
Mentor: Qin Li

EDUCATION

University of Texas at Austin, Austin, Texas, USA 2017 - 2022
Doctor of Philosophy in Mathematics
Advisor: Rachel Ward

Sichuan University, Chengdu, China 2013 - 2017
Bachelor of Science (Honors) in Mathematics

RESEARCH INTERESTS

I am an applied mathematician. My primary research is mathematical foundations of data science. Particular interests include randomized numerical linear algebra, computational inverse problems, experimental design, scientific machine learning, motivated by understanding large-scale and complex physical systems.

PUBLICATIONS

SUNLayer: Stable denoising with generative networks.
(by **R. Jin**, D. G. Mixon and S. Villar.) arXiv/1803.09319, submitted, 2026.
Data selection: at the interface of PDE-based inverse problem and randomized linear algebra.
(by K. Hellmuth, **R. Jin**, Q. Li, and S. Wright.)
To appear in "Handbook of Numerical Analysis". arXiv/2510.01567.
Continuous nonlinear adaptive experimental design via gradient flow.
(by **R. Jin**, Q. Li, S. Mussmann and S. Wright.) arXiv/2411.14332, 2024.
Unique reconstruction for discrete inverse problems: a random sketching approach via subsampling.
(by **R. Jin**, Q. Li, A. Nair and S. Stechmann.) Inverse Problems, 2025. journal link
Optimal experimental design for linear models via gradient flow.
(by **R. Jin**, M. Guerra, Q. Li and S. Wright.)
To appear in "Communications on Pure and Applied Analysis". arXiv/2401.07806, 2024.
Scalable symmetric Tucker tensor decomposition.
(by **R. Jin**, J. Kileel, T. G. Kolda and R. Ward.) SIAM Journal on Matrix Analysis and Applications, 2024. journal link
Space-time reduced-order modeling for uncertainty quantification.

(by **R. Jin**, F. Rizzi and E. Parish.) CSRI Summer Proceedings, Sandia National Laboratories, 2021. arXiv/2111.06435

Tensor-structured sketching for constrained least squares.
(by K. Chen and **R. Jin**.) SIAM Journal on Matrix Analysis and Applications, 2021. journal link

Faster Johnson-Lindenstrauss Transform via Kronecker Products.
(by **R. Jin**, T. G. Kolda and R. Ward.) Information and Inference: A Journal of the IMA, 2020. journal link

EXPERIENCES

NSF Mathematical Science Graduate Intern May - August 2021
Sandia National Laboratories Mentors: Eric Parish and Francesco Rizzi
Developed and implemented space-time reduced-order modeling algorithm for large-scaled uncertainty quantification problems.

Visiting student June - August 2019
Simons Institute for the Theory of Computing
Participated seminars about state-of-the-art deep learning research.

AWARDS

Rising Stars in Computational and Data Sciences 2022
Oden Institute, UT-Austin
NSF Mathematical Sciences Graduate Internship 2021
National Science Foundation
Graduate School Summer Fellowship 2019
UT Austin
Lixin Tang Fellowship (Highest Undergraduate Scholarship) 2016
Shinesun Group and Sichuan University

SERVICES

Co-organizer of **AMS Postdoc Seminar, Johns Hopkins** 2025 - present
Co-organizer of **Workshop: Data-driven PDE inverse problems, UW-Madison** August 2024
Co-organizer of **IFDS Ideas Forum, UW-Madison** 2024 - 2025
Co-organizer of **AIMS special session, Wilmington, NC** June 2023
Member of **Distinguished Women in Mathematics, UT Austin** 2019 - 2022
Mentor of **Directed Reading Program, UT Austin** Spring 2018 and Spring 2020
Organizer of **Junior Applied Math and Probability Seminar, UT Austin** Spring 2019

TEACHING AND MENTORING

Instructor, Johns Hopkins University
EN.553.311: Intermediate Probability and Statistics Fall 2025

Instructor, UW-Madison
Math 535: Mathematical Methods in Data Sciences Fall 2024
Math 320: Linear Algebra and Differential Equations Spring 2024
Math 340: Elementary Matrix and Linear Algebra Spring 2023, Spring 2025

Teaching Assistant, UT Austin 2017 - 2020
Multivariable Calculus, Integral Calculus, ODE with Linear Algebra, Applied Statistics, Probability

Research mentor for Madison Experimental Math Lab, UW-Madison Spring 2025

Research mentor for VISP-MA program, UW-Madison 2023
Directed Reading Program Mentor, UT Austin Spring 2018, Spring 2020

CONFERENCES AND TALKS

IMSI workshop: Statistical and Computational Challenges in Probabilistic SciML June 2025
Chicago, IL
SIAM Conference in Dynamical Systems
Minisymposium: Data Driven and Reduced Order Methods in Dynamical System May 2025
Denver, CO
IMSI workshop: Kernel Methods in UQ and Experimental Design April 2025
Chicago, IL
Numerical Analysis and PDE Seminar March 2025
University of Delaware, Wilmington, DE
The 14th AIMS Conference December 2024
Special session: Kinetic theory, analysis and application
Abu Dhabi, UAE
Workshop: Data-driven PDE-based inverse problem, in theory and practice Aug 2024
Madison, WI
Modern Perspectives in Applied Mathematics July 2024
ETH Zürich, Switzerland
Nonlocal Models: Analysis and Applications June 2024
University of South Carolina, Columbia, SC
Mila Tensor Networks Reading Group March 2024
Quebec AI Institute, virtual
ICERM workshop: Connecting Higher-Order Statistics and Symmetric Tensors Jan 2024
Providence, RI
International Congress on Industrial and Applied Mathematics Aug 2023
Minisymposium: Interpretable constrained tensor decompositions
virtual
TRIPODS Summer Postdoc Workshop August 2023
Chicago, IL
Sampling Theory and Applications Conference July 2023
Special session: Randomized algorithms for complex data
New Haven, CT
SIAM Conference on Optimization June 2023
Minisymposium: Constrained Tensor Methods and Multilinear Optimization
Seattle, WA
The 13th AIMS Conference June 2023
Special session: Data-driven methods in dynamical systems
Wilmington, NC
Workshop: On Forward and Inverse Kinetic theory and related topics September 2022
Madison, WI
SIAM Conference on Mathematics of Data Science September 2022
San Diego, CA
Rising Stars in Computational and Data Sciences Workshop April 2022
Albuquerque, NM
Annual Meeting of the SIAM TX-LA Section November 2021
South Padre Island, TX
CSRI Summer Poster Blitz Session July 2021
Sandia National Laboratories, virtual
SIAM Conference on Mathematics of Data Science May - June 2020

virtual

PACM Colloquium November 2019
Princeton University, Princeton, NJ

Computational Harmonic Analysis, participant October - November 2019
Banff International Research Station, Oaxaca, Mexico

Austin-TAMU Probability and Related Fields, participant October 2019
College Station, TX

Simons Institute Workshop, visiting graduate student June - August 2019
Simons Institute for the Theory of Computing, Berkeley, CA

Gene Golub SIAM Summer School, participant June 2019
Aussois, France

Algorithmic, Mathematical, and Statistical Foundations of Data Science and Applications
April 2019
Purdue University, West Lafayette, IN

Simons Institute Workshop August - December 2018
Simons Institute for the Theory of Computing, Berkeley, CA

SKILLS

Coding: MATLAB, Python.
Languages: English, Chinese.