RUHUI JIN

Department of Mathematics ⋄ University of Wisconsin-Madison
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EMPLOYMENT

Van Vleck Visiting Assistant Professor 2022 - present
Department of Mathematics, University of Wisconsin-Madison
Mentor: Qin Li

Postdoctoral Affiliate 2022 - present
Institute for Foundations of Data Science, University of Wisconsin-Madison

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, experimental design, inverse problems, optimization and their applications in scientific machine learning.

PUBLICATIONS

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.) In revision. arXiv/2403.05935, 2024.

Optimal experimental design for linear models via gradient flow.
(by **R. Jin**, M. Guerra, Q. Li and S. Wright.) In revision. 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.

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 **Workshop: Data-driven PDE-based inverse problems, UW-Madison** August 2024
Co-organizer of **IFDS Ideas Forum, UW-Madison** Spring 2024
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, UW-Madison
Math 535: Mathematical methods in Data Sciences Fall 2024
Math 320: Linear Algebra and Differential Equations (two sessions) Spring 2024
Math 340: Elementary Matrix and Linear Algebra (two sessions) Spring 2023

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

Master's program research mentor, UW-Madison 2023-present
Directed Reading Program Mentor, UT Austin Spring 2018, Spring 2020

CONFERENCES AND WORKSHOPS

Workshop: Data-driven PDE-based inverse problem, in theory and practice Aug 2024
Madison, WI
Modern Perspectives in Applied Mathematics July 2024
Zürich, Switzerland
Nonlocal Models: Analysis and Applications June 2024
Columbia, SC
Mila Tensor Networks Reading Group March 2024
Montréal, Quebec, virtual

ICERM workshop: Connecting Higher-Order Statistics and Symmetric Tensors Jan 2024
Providence, RI
International Congress on Industrial and Applied Mathematics Aug 2023
virtual
TRIPODS Summer Postdoc Workshop August 2023
Chicago, IL
Sampling Theory and Applications Conference July 2023
New Haven, CT
TRIPODS Summer Postdoc Workshop August 2023
Chicago, IL
Sampling Theory and Applications Conference July 2023
New Haven, CT
SIAM Conference on Optimization June 2023
Seattle, WA
AIMS Conference on Dynamical Systems, Differential Equations and Applications June 2023
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.