Nathaniel Pritchard
September 2025

CONTACT

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RESEARCH INTERESTS

Generalized Linear Models. High Performance Computing. Bayesian Statistics. Iterative Solvers. Optimization. Preconditioners. Random Sketching. Statistical Computation.

EDUCATION

University of Wisconsin - Madison, Madison, WI
Ph.D., Statistics August 2018 - May 2024
Adviser: Vivak Patel

University of North Carolina at Chapel Hill Chapel Hill, NC
B.S., Statistics and Analytics (Highest Honors and Highest Distinction) August 2014 - May 2018
Honors Thesis Adviser: Shankar Bhamidi

RESEARCH EMPLOYMENT

University of Oxford, Oxford, United Kingdom
Post Doctoral Research Associate October 2024 -
Supervisor: Yuji Nakasukasa and Per-Gunnar Martinsson
Topic: Certifying accuracy of randomised algorithms in numerical linear algebra

University of Wisconsin-Madison, Madison, Wisconsin
Research Assistant August 2023 - May 2024
Supervisor: Vivak Patel
Topic: Development of Randomized Linear Algebra Library for Julia

Argonne National Labs, Chicago, Illinois
Givens Associate May 2023 - July 2023
Supervisor: Adrian Maldonado
Topic: Accelerating Newton-Ralphson on GPUs using deflation methods

Argonne National Labs, Chicago, Illinois
Givens Associate May 2020 - July 2020
Supervisor: Adrian Maldonado
Topic: Preconditioners for solving graph Laplacians arising from power grid networks

PRE-PRINTS

Pritchard, N., Park, T., Nakasukasa, Y., & Martinsson, G. (2025). Fast Rank Adaptive CUR via a Recycled Small Sketch. arXiv preprint arXiv:2509.21963.

Patel, V., Maldonado, D. A., Melnichenko, M., **Pritchard, N.**, Rao, V., Rebrova, E., & Sankararaman, S. (2025). Scientific Applications Leveraging Random-

ized Linear Algebra. arXiv preprint arXiv:2506.16457.

PUBLICATIONS

Pritchard, N., & Patel, V. (2023). Solving, Tracking and Stopping Streaming Linear Inverse Problems. *Inverse Problems*, 40 (8), 10.1088/1361-6420/ad5583.

Pritchard, N., & Patel, V. (2023). Towards Practical Large-Scale Randomized Iterative Least Squares Solvers through Uncertainty Quantification. *SIAM/ASA Journal on Uncertainty Quantification*, 11(3), 10.1137/22M1515057.

He, M., Glasser, J., **Pritchard, N.**, Bhamidi, S., & Kaza, N. (2020). Demarcating geographic regions using community detection in commuting networks with significant self-loops. *PloS one* 15(4), e0230941.

TALKS

"Small Sketches for Big Matrix Approximations" September 2025 ENUMATH in Heidelberg, Germany.

"Small Sketches for Big Matrix Approximations" July 2025 SIAM Annual Meeting in Montreal, Canada.

"Small Sketches for Big Matrix Approximations" June 2025 at The 30th Biennial Numerical Analysis Conference in Glasgow, Scotland.

"Statistical Approaches to Numerical Linear Algebra" March 2025 at Optimization and Numerical Linear Algebra Exposé at the Rutherford Appleton Laboratory in Didcot, UK.

"Who needs a residual when an approximation will do?" December 2024 at Numerical Analysis Internal Seminar in Oxford, UK.

"Tracking Progress in a Big Data World" October 2024 at SIAM Mathematics of Data Science in Atlanta, Georgia.

"Iterative Right Random Sketching for Large-Scale Logistic Regression." August 2024 at Joint Statistical Meeting in Portland, Oregon.

"Computationally Efficient Tracking for Iterative Random Sketching." May 2024 at SIAM Applied Linear Algebra Conference in Paris, France.

"Computationally Efficient Tracking for Iterative Random Sketching." April 2024 at IFDS Ideas Forum in Madison, Wisconsin.

"Large-scale randomized iterative least squares." March 2023 at SIAM CSE in Amsterdam, Netherlands.

"Towards practical large-scale least squares solvers with Iterative Right Random Sketching." February 2023 at Argonne National Labs LANS seminar in Chicago, Illinois (Virtual).

"Residual Tracking and Stopping for Iterative Random Sketching" April 2022 at Copper Mountain Conference on Iterative Methods in Copper Mountain, Colorado (Virtual).

HONORS & AWARDS

SIAM Student Travel Award (SIAM LA 2024) May 2024.

Outstanding TA May 2023.

Student Research Grant Competition UW - Madison February 2023.

Outstanding TA (Honorable Mention) May 2022.

SERVICE

Committee Service: TA Training Redesign (2020), Space Committee (2021), Awards and Outreach Committee (2022).

Statistics Graduate Student Association: Outreach Chair (Spring 2018 - Fall 2020), President (Fall 2020 - Spring 2023).

Journal Reviewer: IMA Journal of Numerical Analysis

SKILLS

Computer Languages: Julia, R, C, C++, Python

APIs: CUDA, MPI, OpenMP, PETSc

SOFTWARE

RLinearAlgebra (Co - Developer): A Julia Package for prototyping and benchmarking Randomized Linear Algebra algorithms.