Nathaniel Pritchard
June 2024

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

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

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

PRE-PRINTS

PUBLICATIONS

Pritchard, N., & Patel, V. (2023). "Solving, Tracking and Stopping Streaming Linear Inverse Problems." *Inverse Problems*, Accepted, 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

"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).

SKILLS

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

APIs: CUDA, MPI, OpenMP, PETSc

SOFTWARE

RLinearAlgebra (Contributor): A Julia package for benchmarking algorithms in Randomized Linear Algebra.
Largsitic Regression (Under Development): A Julia package that allows for the benchmarking of different logistic regression techniques.
LSPreconditioners (Under Development): A comprehensive Julia package of preconditioners for linear systems.