Pervez Ali

Ph.D. Candidate in Mathematics
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Research Interests

Design and analysis of Langevin-type Markov chain Monte Carlo algorithms, especially nonreversible dynamics and sampling of constrained, non-smooth and heavy-tailed targets; nonasymptotic convergence guarantees and large deviations analysis of samplers, paired with careful numerical studies; stochastic optimization and sampling for Bayesian inference and generative modeling.

Education

Florida State University — Expected June 2027
Ph.D. in Mathematics — Tallahassee, FL, USA

- Advisor: Lingjiong Zhu
- Dissertation: *Non-Reversible Langevin Dynamics for Unconstrained and Constrained Sampling*
- Fulbright Scholar

Sukkur IBA University — 2019
M.S. in Mathematics — Sukkur, Pakistan

- Focus: probability, stochastic processes, and mathematical finance (option pricing)

University of Sindh — 2016
B.S. in Mathematics — Jamshoro, Pakistan

Publications and Preprints

[1] **Pervez Ali**, Xiaoyu Wang, Yingli Wang, and Lingjiong Zhu. *Accelerating non-smooth and heavy-tailed sampling.* Preprint, arXiv:2610.11139, 2026.

[2] **Pervez Ali**, Weihao Dong, and Xiaoyu Wang. *Penalized nonreversible Langevin for constrained sampling.* Preprint, arXiv:2609.25381, 2026.

[3] Nian Yao, **Pervez Ali**, Xihua Tao, and Lingjiong Zhu. *Accelerating Langevin Monte Carlo sampling: A large deviations analysis.* Preprint, arXiv:2503.19066, 2025.

[4] Javed Hussain and **Pervez Ali**. *On modelling and pricing weather derivatives driven by nonlinear Brownian motion.* International Journal of Analysis and Applications **19**(1):29–46, 2021.

Talks

- *Accelerating Langevin Monte Carlo sampling: A large deviations analysis.* — May 2026
  5th International Conference on Computing, Mathematics and Engineering Technologies (iCoMET 2026), Sukkur IBA University
- *On modelling and pricing weather derivatives driven by nonlinear Brownian motion.* — Jan 2020
  iCoMET 2020, Sukkur IBA University

Conferences and Schools Attended

- Math in Industry Symposium, Florida State University — Feb 2025, Feb 2026
- Second Joint Alabama–Florida Conference on Differential Equations, Dynamical Systems and Applications, Florida State University — May 2024
- Southeast Applied and Computational Math Student Workshop, Georgia Tech, Atlanta, GA — Apr 2024
- AMS Spring Southeastern Sectional Meeting, Florida State University — Mar 2024

- Hausdorff School: Formal Mathematics and Computer-Assisted Proving, University of Bonn — Sep 2023
- Florida–Georgia Applied Computational Math Student Workshop, Florida State University — Apr 2023
- Winter School on Risk, Stochastic, Finance and Insurance, Sukkur IBA University — Dec 2018
- iCoMET 2018, Sukkur IBA University — Mar 2018

Teaching Experience

Florida State University — Aug 2022 – present
Graduate Teaching Assistant and Instructor — Tallahassee, FL, USA

- **Instructor:** Calculus I (Spring 2025, Summer 2025), Calculus II (Fall 2025, Spring 2026), Calculus III (Summer 2026, Fall 2026).
- **Teaching assistant:** Calculus, Trigonometry, College Algebra; tutor, Math Resource Center.

Sukkur IBA University — Aug 2017 – Jul 2022
Lecturer in Mathematics — Sukkur, Pakistan

- **Mathematics:** Calculus I–III, Linear Algebra, Ordinary Differential Equations, Scientific Computing.
- **Probability and statistics:** Probability, Statistics, Inferential Statistics.
- **Business and actuarial:** Business Mathematics, Business Statistics, Actuarial Mathematics.

Fellowships and Awards

- Educator of the Year Award — 2023
- Travel grant to attend the Hausdorff School, University of Bonn — 2023
- Fulbright Scholarship for Ph.D. study in the United States — 2022
- Departmental Merit Scholarship, Sukkur IBA University — 2019
- Prime Minister's Scholarship for M.S. study (fully funded) — 2018
- Student of the Year in Mathematics, University of Sindh (awarded a laptop) — 2015

Service, Outreach, and Mentoring

- Vice President, SIAM Student Chapter, Florida State University — 2023 – 2024
- Fulbright outreach: led seven information sessions on the Fulbright program at three institutions.
- Mentored undergraduate projects at Florida State University and Sukkur IBA University.

Computing and Languages

Computing: Python (NumPy, SciPy, PyTorch, Matplotlib), MATLAB, LaTeX.
Languages: English (fluent), Urdu (native), Sindhi (native), Punjabi.