Phalguni Nanda

Edwardson School of Industrial Engineering
Purdue University, West Lafayette, IN 47906, USA
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Research Interests

My research develops rigorous non-asymptotic analyses that characterize sample complexity and learning dynamics in reinforcement learning, with the goal of designing algorithms that are practically effective and provably efficient in high-dimensional stochastic settings for sequential decision making.

Education

Purdue University — West Lafayette, IN, USA
Ph.D. in Operations Research — May 2025 – Present
Edwardson School of Industrial Engineering
Advisor: Prof. Zaiwei Chen
M.S. in Mathematical Statistics — August 2022 – May 2025
Department of Statistics

National Institute of Technology Rourkela — Rourkela, Odisha, India
Integrated (Five-Year) M.Sc. in Mathematics — July 2013 – June 2018
Dissertation: Stochastic comparisons of series and parallel systems with heterogeneous components
Advisor: Prof. Suchandan Kayal
Honors and Awards: Scholarship for Higher Education (SHE) under INSPIRE programme

Work Experience

Birla Institute of Technology and Science, Pilani - Hyderabad — Hyderabad, India
Project Assistant, Department of Mathematics — March 2020 - January 2022
Project: Adaptive and efficient method of fundamental solutions for the numerical reconstruction of boundary data in two-phase inverse Stefan problems
Principal Investigator: Prof. Gujji Murali Mohan Reddy
Funding: Anusandhan National Research Foundation (ANRF)

Indian Statistical Institute Kolkata — Kolkata, India
Summer Intern, Applied Statistics Unit — May 2017 - July 2017
Supervisors: Prof. Anup Dewanji and Prof. Prajamitra Bhuyan

Publications

Submitted/Working Papers

1. P. Nanda and Z. Chen. Natural Policy Gradient as Doubly Smoothed Policy Iteration: A Bellman-Operator Framework. *Submitted.*
2. Z. Chen and P. Nanda. From set convergence to pointwise convergence: finite-time guarantees for average-reward Q-learning with adaptive stepsizes. *Under review at Mathematics of Operations Research*

Published Articles

1. P. Nanda and Z. Chen. A minimal-assumption analysis of Q-learning with time-varying policies. *Accepted to ACM SIGMETRICS 2026 (Best Paper Award Finalist), to appear in Proceedings of the ACM on Measurement and Analysis of Computing Systems.* https://arxiv.org/abs/2510.16132

2. G. M. M. Reddy, P. Nanda, M. Vynnycky. A decompositional approach for two-dimensional, two-phase, nonlinear inverse Stefan problems using the method of fundamental solutions. *Studies in Applied Mathematics*, 156:e70184, 2026, https://onlinelibrary.wiley.com/doi/full/10.1111/sapm.70184

3. P. Nanda, G. M. M. Reddy, and M. Vynnycky. Inverse two-phase nonlinear Stefan and Cauchy-Stefan problems: A phase-wise approach. *Computers and Mathematics with Applications*, 123:216–226, 2022, https://doi.org/10.1016/j.camwa.2022.08.009

4. P. Nanda, G. M. M. Reddy. Efficient numerical solution of one-phase linear inverse Stefan and Cauchy-Stefan problems in two-dimensions: *a posteriori* error control. *Studies in Applied Mathematics*, 148(4) : 1563 – 1585, 2022, https://doi.org/10.1111/sapm.12484

5. G. M. M. Reddy, P. Nanda, M. Vynnycky and J.A. Cuminato. Efficient numerical solution of boundary identification problems: MFS with adaptive stochastic optimization. *Applied Mathematics and Computation*, 409:126402, https://doi.org/10.1016/j.amc.2021.126402

6. P. Nanda, P. Bhuyan and A. Dewanji. Optimal replacement policy under cumulative damage model and strength degradation with applications. *Annals of Operations Research*, https://doi.org/10.1007/s10479-021-04080-6.
(Contributed poster presentation at the 2017 IISA International Conference on Statistics, Hyderabad, India, December 2017.)

7. G. M. M. Reddy, P. Nanda, M. Vynnycky and J.A. Cuminato. An adaptive boundary algorithm for the reconstruction of boundary and initial data using the method of fundamental solutions for the inverse Cauchy–Stefan problem. *Computational and Applied Mathematics*, 40(3):1–26, 2021, https://doi.org/10.1007/s40314-021-01454-1

8. S. Kayal and P. Nanda. Stochastic comparisons of parallel systems with generalized Kumaraswamy-G components. *Communications in Statistics - Theory and Methods*, 51(14):4712-4738, https://doi.org/10.1080/03610926.2020.1821889

9. P. Nanda and S. Kayal. Mean inactivity time of lower record values. *Communications in Statistics - Theory and Methods*, 48(20):5145–5164, 2019, https://doi.org/10.1080/03610926.2018.1508714

10. N. Balakrishnan, P. Nanda and S. Kayal. Ordering of series and parallel systems comprising heterogeneous generalized modified Weibull components. *Applied Stochastic Models in Business and Industry*, 34(6):816–834, 2018, https://doi.org/10.1002/asmb.2353.

11. L. K. Patra, S. Kayal and P. Nanda. Some stochastic comparison results of series and parallel systems with heterogeneous Pareto type components. *Applications of Mathematics*, 63(1):55-77, 2018, https://doi.org/10.21136/AM.2018.0105-17.

Teaching

Purdue University, West Lafayette.

Teaching Assistant, Edwardson School of Industrial Engineering.

- IE 230 - Probability and Statistics in Engineering I, Spring 2026
- IE 533 - Industrial Applications of Statistics, Spring 2026

Teaching Assistant, Department of Statistics.

- STAT 113 - Statistics and Society, Fall 2022, Spring & Fall 2023, Spring & Fall 2024
- STAT 30301 - Probability and Statistics for Business, Spring 2025
- STAT 416 - Introduction to Probability, Fall 2022
- STAT 517 - Statistical Inference, Spring 2023, Fall 2023
- STAT 511 - Statistical Methods, Summer 2023, Summer 2024
- STAT 516 - Basic Probability and Applications, Spring 2024

Programming

- MATLAB, R, C++, Python