MANISH PANDEY

Postdoctoral Researcher ▪ Department of Mathematics, Stochastics Group ▪ Aarhus University

m.pandey@math.au.dk ▪ Personal website

Research Interests

Probability theory; stochastic processes; random graphs; large deviations; associative memory models.

Education

Eindhoven University of Technology (TU/e) Aug 2020 – Jan 2025
Ph.D. in Mathematics — Supervisors: Remco van der Hofstad & Georgios Exarchakos

Indian Statistical Institute, Delhi & Kolkata Jul 2018 – Jun 2020
M.Stat. (Probability Specialization) — Overall: 89.5%

Indian Statistical Institute, Bangalore Jul 2015 – May 2018
B.Math. (Hons.) — Overall: 89.4%

St. Theresa Senior Secondary School, Haldwani Apr 2014 – Mar 2015
AISSCE (Class XII) — Overall: 93%; Science aggregate: 96.34%

Publications

A. Chakrabarty, **M. Pandey**, S. Chakrabarty. *Length of stationary Gaussian excursions*. *Proceedings of the American Mathematical Society* **151**(3):1339–1348, 2023.

R. van der Hofstad, **M. Pandey**. *Connectivity of random graphs after centrality-based vertex removal*. *Journal of Applied Probability* **61**:967–998, 2024.

R. van der Hofstad, **M. Pandey**. *Are giants in random digraphs "almost" local?* *Electronic Communications in Probability* **30**:1–13, 2025.

O. Nagy, **M. Pandey**, G. Exarchakos, M. Bentum, R. van der Hofstad. *Communication protocol for a satellite-swarm interferometer*. *arXiv:2312.15814*, submitted (2023).

M. Pandey. *Centrality Measures: Who Is the Most Important in a Network?* *The Network Pages*, 2023.

Ph.D. thesis: *Centrality measures and connectivity properties in large networks*. Eindhoven University of Technology (TU/e), 2025.

Honours & Awards

- ISI Teachers' Committee Awards for outstanding academic performance (**M.Stat**, 2018–2020; **B.Math (Hons.)**, 5/6 semesters, 2015–2018)
- Institute stipend/fellowship throughout **M.Stat** (2018–2020) and **B.Math (Hons.)** (2015–2018)
- Nominee, **P. C. Mahalanobis Gold Medal** (Top 4, M.Stat cohort 2018–2020, ISI)

- **International Rank 41** & **Zonal Rank 1** (UP & Uttarakhand), SOF–International Mathematics Olympiad (2015)
- **All India Rank 9**, M.Stat Entrance Examination, Indian Statistical Institute
- Top **1%** in **NSEP** (2014–2015); Merit Certificate (IAPT)

Academic & Professional Experience

Supervision of PhD student Aug 2025 – present
Aarhus University — Department of Mathematics

Visiting Research Scholar Summer 2024
School of Industrial Engineering — Purdue University

Invited Speaker Jul 2021
Bézout–Eurandom Conference, Franco–Dutch Meeting — IHP, Paris

Speaker May 2022; Oct 2022
NETWORKS Training Week — Asperen

Teaching Assistant Aug 2020 – Feb 2023
Calculus, Probability, and Statistics — Eindhoven University of Technology

Poster Presentation 26–30 Jun 2023
LMS Probability Research School — Liverpool

Invited Participant Jan 2020
Master Classes in Probability — University of Strasbourg

Internships

Purdue University, West Lafayette, USA — Visiting Research Scholar Summer 2024

- Studied cascading in networks, developing methods to model how local disruptions propagate and to predict when they escalate into system-wide cascades (e.g., supply-chain shocks).

State Street Global Advisors, Bangalore, India (Active Quantitative Equity) Summer 2019

- Studied portfolio optimization (Beasley, *Portfolio Optimization: Models and Solution Approaches*); implemented factor-model–based optimization.
- Accelerated large-scale matrix inversion using the Woodbury identity; reduced inversion time to $< 2\,\mathrm{s}$ for $\sim 2 \times 10^5$-dimensional unconstrained steps.
- Applied constrained portfolio optimization using CVXR with $> 45{,}000$ assets and 250 factors (industry/style).

NovelSynth Soft Solutions (Petrabytes), Bangalore, India Winter 2017

- Studied and documented core ML algorithms with working examples on provided datasets.

Ongoing Projects

Cascading in networks; Centrality comparison curves; Geometric Hopfield model.

Technical Skills

Programming Python; C/C++; R; HTML
Tools LaTeX; MATLAB; Microsoft Office

Languages

English; Hindi