MANISH PANDEY

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🏠 Mathematics Department, Aarhus University, Denmark

INTERESTS

Stochastic Processes, Probability, Random Graphs, Large Deviations, Neural Networks

EDUCATION

- **Eindhoven University of Technology** *Aug 2020 – Jan 2025*
  Ph.D. in Mathematics — *Centrality Measures in Random Networks*
  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 School** *Apr 2014 – Mar 2015*
  AISSCE (Class XII); Overall: 93%; Sciences Aggregate: 96.34%

PUBLICATIONS

1. A. Chakrabarty, M. Pandey, S. Chakrabarty. Length of stationary Gaussian excursions, *Proc. AMS*, 151(3):1339–1348 (2023).

2. R. van der Hofstad, M. Pandey. Connectivity of random graphs after centrality-based vertex removal, *J. Appl. Probab.*, 61:967–998 (2024).

3. R. van der Hofstad, M. Pandey. Are giants in random digraphs 'almost' local?, *Electron. Commun. Probab.*, 30:1–13 (2025).

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

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

HONOURS & AWARDS

- Indian Statistical Institute Teachers' Committee Awards for Outstanding Academic Performance in all semesters of **M.Stat** (2018–2020)

- Indian Statistical Institute Teachers' Committee Awards for Outstanding Academic Performance in five of six semesters of **B.Math (Hons.)** (2015–2018)

- Institute stipend/fellowship throughout **M.Stat** (2018–2020) and **B.Math (Hons.)** (2015–2018)

- Offer received: **IRMIA Labex Doctoral Grant** (2020)

- Nominated for the **P. C. Mahalanobis Gold Medal** (Top 4; M.Stat, 2018–2020, ISI)
- **International Rank 41** and **Zonal Rank 1** (UP & Uttarakhand) in the **SOF–International Mathematics Olympiad** (2015)
- **All India Rank 9** in the M.Stat Entrance Examination, Indian Statistical Institute
- Ranked among the **top 1%** in **NSEP** (2014–2015); Merit Certificate from the Indian Association of Physics Teachers

ACADEMIC & PROFESSIONAL EXPERIENCE

- Supervision of PhD student   *Aug 2025 – present*
- Visiting Research Scholar, Purdue University, School of Industrial Engineering   *Summer 2024*
- Invited Speaker, Bézout–Eurandom Conference (Franco–Dutch Meeting), IHP, Paris   *Jul 2021*
- Speaker, Networks Training Week, Asperen   *May 2022; Oct 2022*
- Teaching Assistant — Calculus, Probability, and Statistics, TU Eindhoven *Aug 2020 – Feb 2023*
- Poster Presentation, LMS Probability Research School, Liverpool   *26–30 Jun 2023*
- Invited to Master Classes in Probability, Strasbourg University   *Jan 2020*

INTERNSHIPS

- **State Street Global Advisors, Bangalore, India**   Summer 2019
  Intern, Trainee in Investment Research   *Active Quantitative Equity*
  · Worked on 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 < 2s for $\sim 2 \times 10^5$ dimension (unconstrained step).
  · Applied constrained portfolio optimization using CVXR with $> 45{,}000$ assets and 250 factors (industry/style).

- **NovelSynth Soft Solutions (Petrabytes), Bangalore, India**   Winter 2017
  Intern
  · Studied and documented core ML algorithms (perceptron, neural networks) with working examples on provided datasets.

ONGOING WORK

1. Cascading in networks (2025+) - M. Pandey, S. Dhara, L. Schulman. *Work in progress.*

2. Bringing order to centrality measures (2025+) - O. Nagy, M. Pandey, G. Exarchakos, R.v.d. Hofstad. *Work in progress.*

3. On the locality of the centrality comparison curves and centrality measures (2025+) - M. Pandey, R.v.d. Hofstad, G. Exarchakos. *Work in progress.*

4. Geometric Hopfield Model (2025+) - M. Heydenreich, C. Hirsch, M. Pandey. *Work in progress.*

KEY COURSES UNDERTAKEN

- **B.Math (2015–2018)** — Analysis I–IV, Algebra I–IV, Statistics I–IV, Probability I–IV, Complex Analysis, Differential Equations, Differential Geometry, Graph Theory, Computer I–II, Combinatorics*, Topology, Optimization, Physics I–IV.

- **M.Stat (2018–2020)** — Linear Algebra & Linear Models, Probability Theory, Analysis I–II, Statistical Inference, Regression Techniques, Large Sample Methods, Measure-Theoretic Probability, Multivariate Analysis, Survey Sampling & Design of Experiments, Nonparametric & Sequential Methods*, Official Statistics Training*, Introductory Programming*, Martingale Theory, Functional Analysis, Time Series, Statistical Computing, Pattern Recognition, Weak Convergence & Empirical Processes, Brownian Motion & Diffusion, High-Dimensional Data, Game Theory.

*Non-credit

TECHNICAL SKILLS

Programming:	R, C, C++, Python, HTML
Tools:	MATLAB, LaTeX, Microsoft Office

EXTRA-CURRICULAR ACTIVITIES

- Organised cello workshop for the SPOR cluster, TU Eindhoven (2024)

- ASML Half Marathon (2023) and Quarter Marathon (2022), Eindhoven

- Chaos (Annual Fest, ISI Bangalore): active participation and organization (2015–2018)

- Skits and dramas, ISI Bangalore (2016–2018)

- Core member, Maintenance Committee (hostel and mess), ISI Bangalore (2017)

- Mess Manager: fund, budget, marketing, and menu, ISI Delhi (2018)

REFERENCES

- **Prof. Remco van der Hofstad** ✉ *r.w.v.d.hofstad@tue.nl*
  Department of Mathematics and Computer Science, TU Eindhoven
  Webpage: `https://www.win.tue.nl/~rhofstad/`

- **Assoc. Prof. Christian Hirsch** ✉ *hirsch@math.au.dk*
  Associate Professor for Data Science and Statistics, Aarhus University
  Webpage: `https://christian-hirsch.netlify.app/`

- **Prof. Arijit Chakrabarty** ✉ *arijit.isi@gmail.com*
  Theoretical Statistics and Mathematics Unit, ISI Kolkata
  Webpage: `https://www.isical.ac.in/~arijitc/`

LANGUAGES

English, Hindi