Arijit Dey | Curriculum Vitae

Second Year Graduate Student in Statistics – Duke University
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Education

Duke University — Durham, USA
Ph.D. in Statistics, GPA: 3.783/4 — *2024–Present*

Indian Institute of Technology Kanpur (IITK) — Kanpur, India
M.Sc. in Statistics, *CPI: 9.55/10* — *2022–2024*

Ramakrishna Mission Residential College (Autonomous), Narendrapur — Kolkata, India
B.Sc. in Statistics, *CGPA: 9.58/10* — *2019–2022*

Publications

Submitted papers

- Dey, A. and Hazra, A. (2025+). A Semiparametric Generalized Exponential Regression Model with a Principled Distance-based Prior. Under Review in *Statistical Papers*. Link- `https://arxiv.org/abs/2309.03165`.

Paper in preparation

- Dey, A., Yan, X., and Chakraborty, B. (2025+). Precision-based and power-based sample size calculations for SMART design with skewed outcomes.

Research Projects

A semiparametric generalized exponential (GE) regression model with a principled distance-based prior for analyzing trends in rainfall

Mentor: Dr. Arnab Hazra, Dept. of Mathematics and Statistics, IITK — **Summer 2023**

- Conducted a comprehensive analysis of precipitation data in the Western Ghats region from 1901 to 2022.
- Developed a semiparametric GE regression model that extends the GE distribution to a regression setting.
- Constructed a novel class of penalized complexity prior for the shape parameter of the GE distribution.

Sample size calculation of sequential multiple assignment randomized trial (SMART) design with skewed outcome

Mentor: Dr. Bibhas Chakraborty, Duke-NUS Medical School — **Mar'23–Apr'24**

- Explored the literature on SMART design for clinical trials and its optimal sample size calculation.
- Developed sample size calculation formulas based on precision and power for the SMART design with skewed outcomes, suitable for both full-scale SMART and pilot-SMART studies.

Kernel Stein discrepancy (KSD) in Markov chain Monte Carlo (MCMC)

Mentor: Dr. Dootika Vats, Dept. of Mathematics and Statistics, IITK — **Fall 2023**

- Explored the literature on KSD and demonstrated its high computational cost.
- To reduce the computation burden, Stein-thinning was employed by discrepancy-based sub-sampling.
- Extended the notion of Stein-thinning to the realm of biased MCMC to remove the bias introduced.

Experiences

- **Teaching Assistant, Duke University**
  - STA199: Grading, Holding Office Hours, Lab Leader — Spring 25
- **Research Assistant, IIT Kanpur** — Spring 24

- **Teaching Assistant, Online Degree Program, IIT Madras** Summer 23

Acedemic Achievements

- *N. Balakrishnan Award in Statistics* for the best final-year M.Sc. (2-year) statistics student.
- *Academic Excellence Award* in Statistics for 2022 and 2023, IIT Kanpur.
- All India Rank 15 in Joint Admission Test for Masters (JAM) 2022 among 2912 candidates.
- *Swami Lokeswarananda award* for best all-around performances in U.G. courses 2021-22.
- *DST-inspire scholarship* for being in the top 1 percentile of higher secondary board exams.

Relevant Coursework

- **PhD Level Course (Duke University)**

  Bayesian Statistical Modelling, Probability and Measure Theory, Linear Models, Statistical Inference, Probability and Statistical Models.
- **Masters Level Course (IIT Kanpur)**

  Linear Algebra, Real Analysis, Complex Analysis, Probability and Measure Theory, Statistical Inference, Regression Analysis, Time Series Analysis, Multivariate Analysis, Stochastic Process, Statistical Computing, Non-parametric Inference, Game Theory, Data Science Lab I, II & III, Intro to Machine Learning.

Skills

Programming Expertise: *R* (Proficient), *Python* (Beginner)

System software: LaTeX, GitHub, Microsoft Office

Languages: English (Professional), Bengali (Native), Hindi (Limited), Spanish (Beginner)