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

Peer-reviewed

○ Dey, A. and Hazra, A. (2025). A Semiparametric Generalized Exponential Regression Model with a Principled Distance-based Prior. *Statistical Papers*. Link

Submitted

○ Dey, A., Yan, X., and Chakraborty, B. (2025+). Sample size calculation of SMART design with a skewed outcome: Application to the SMART+ study. Submitted in Statistical Methods in Medical Research.

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 SMART design with skewed outcome: Application to the SMART+ study

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
  - STA199: Grading, Holding Office Hours, Lab Leader   Fall 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, High-dimensional Statistics.

- ○ **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*

System software: LaTeX, GitHub, Microsoft Office

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