Pronoma Banerjee

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Education

Purdue University — West Lafayette, Indiana
PhD. Operations Research (School of Industrial Engineering) — *Aug '24- Present*

Birla Institute of Technology and Science, Pilani — Goa, India
B.E. Computer Science, Integrated MSc. Mathematics — *Aug '19- Aug'24*

Selected Research Experience

Stochastic Systems Lab, Purdue — West Lafayette, Indiana
Graduate Research Assistant, Supervisor: Dr. Harsha Honnappa — *August 2024 - Present*

- Working on min-time mixing in Annealed Langevin dynamics and Score-based Diffusion models [Code] [Report]
- Utilizing score-based diffusion for the analysis of time-series and other stochastic datasets.

Oden Institute of Computational Sciences, UT Austin — Austin, Texas
Research Engineering/Scientist Associate, Supervisor: Dr. Chandrajit Bajaj — *June 2022 - May 2024*

- Developed an agent-based classifier to produce accuracy close to SOTA on MNIST dataset with partial observation of images. Extended the formulation for H-bond prediction in molecules. [Report]
- Performed material-specific hyperspectral image super-resolution with RGB via semantic segmentation. [Thesis]

APPCAIR, BITS Pilani — Goa, India
Undergraduate Researcher, Supervisor: Dr. Snehanshu Saha, — *November 2021 - May 2023*

- Developed ABC-GAN, which aims at correcting likelihood misspecification in prior models with the aid of approximate Bayesian inference. This made several well known regressors much more robust to noise.
- Developed Synth-Breeder- a genetic algorithm based music generator. *[Process document][Team page]*

Indian Statistical Institute, Kolkata — Kolkata, India
Summer Research Intern, Supervisor: Dr. Subhamoy Maitra — *June 2020 - July 2020*

- Game-theoretic analysis of computer games in classical (C program) and quantum (IBMQ) environments. *[Code]*

Manuscripts

- **Correcting Model Misspecification via Generative Adversarial Networks** [PDF]
  Pronoma Banerjee, Manasi Gude, Rajvi Sampat, Sharvari Hedaao, Soma Dhavala, Snehanshu Saha
- **Continuous Model Improvement via Adversarial Optimization** [PDF]
  Sharvari Hedaao, Manasi Gude, Pronoma Banerjee, Rajvi Sampat, Soma Dhavala, Snehanshu Saha

Achievements

Workshop Selection: Brain, Computation & Learning Workshop at IISc, Bangalore (Acceptance =0.8%)
Merit Scholarship and Workshop: by INSPIRE-DST and JBNSTS (top 0.5% in West Bengal in boards).
Award: All India (National) Rank 1 in Science in ICSE (100/100 PCB).

Teaching & Mentorship

Graduate Teaching Assistant- Stochastic Models in Operations Research, Probability and Statistics
Undergraduate Teaching Assistant- Graphs and Networks, Computer Programming, Discrete Math.
Course Instructor and Project Mentor- Introduction to Data Science (QSTP, BITS Goa).
Academic Mentor- Probability and Statistics (Academic Assistance Program, CTE, BITS Goa.)

Relevant Coursework

Graduate: Reinforcement Learning & Control, Stochastic Processes & Networks, Real Analysis & Measure Theory.
Undergraduate: (CS): Foundations of Data Science, Data Structures & Algorithms, OOP, DBMS, Computer Networks, Microprocessors (Math): Optimization (linear, non-linear), Graphs & Networks, Discrete Math, Differential Equations, Operations Research, Linear Algebra, Probability and Statistics, Applied Statistical methods, Topology