Pronoma Banerjee

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Education

PhD Student, School of Industrial Engineering — Aug 2024- Aug 2029
Purdue University — *West Lafayette, Indiana*
Coursework: Reinforcement learning and control, stochastic process and networks, engineering economics (intermediate microeconomics and game theory), systems simulation, real analysis and measure theory.

Integrated MSc. Mathematics — Aug 2019- Aug 2024
Birla Institute of Technology and Science, Pilani — *Goa, India*
Coursework: Linear and non-linear optimization, applied statistical methods, ordinary and partial differential equations, graph theory, numerical analysis, discrete mathematics, linear algebra, probability and statistics, multivariable calculus.

B.E. Computer Science — Aug 2019- Aug 2024
Birla Institute of Technology and Science, Pilani — *Goa, India*
Coursework: Foundations of data science, data structures and algorithms, database management and systems.

Research & Teaching Experience

Intelligent Systems and Assistive Technologies Lab, Purdue — West Lafayette, Indiana
Researcher, Supervisor: Dr. Juan Wachs — *July 2025 - Present*

- Designing a pipeline for unsupervised imitation learning from videos using VLMs and diffusion policy.
- Designing models for efficient diagnosis of burn-injury progression using ultrasound. Using ultrasound enables us to remove skin color, racial and gender bias in data as compared to RGB images.

Edwardson School of Industrial Engineering, Purdue — West Lafayette, Indiana
Graduate Teaching Assistant — *Aug 2024 - Present*

- Teaching & grading for Stochastic Models in OR (twice), Optimization, Probability & Statistics for Engineers.

Stochastic Systems Lab, Purdue — West Lafayette, Indiana
Graduate Research Assistant, Supervisor: Dr. Harsha Honnappa — *Aug 2024 - July 2025*

- Performed an extensive survey on the theoretical foundations of continuous time diffusion models. Rewrote the score-based models and score-based diffusion model literature for the applied probability community.
- Modeling a framework for optimizing the noise-schedule in discrete time diffusion models.

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.
- Performed material-specific hyperspectral image super-resolution with RGB via semantic segmentation. [Thesis]

Birla Institute of Technology and Science, Pilani — Goa, India
Undergraduate Researcher, Supervisor: Dr. Snehanshu Saha — *Nov 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 graph-based software that mimics an evolution model for automatic music generation. One of the 15 teams selected to present at the international, AI song contest 2022. Presented at MILA, Quebec.

Publications

- **Correcting Model Misspecification via Generative Adversarial Networks (2023)**
  Pronoma Banerjee, Manasi Gude, Rajvi Sampat, Sharvari Hedaao, Soma Dhavala, Snehanshu Saha
- **Continuous Model Improvement via Adversarial Optimization (2022)**
  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 (National Rank 1 in Science in ICSE).