Maitreyi Swaroop — Curriculum Vitae

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EDUCATION

Carnegie Mellon University, Pittsburgh, USA — August 2024 — Present
Ph.D. Candidate
Department of Machine Learning, School of Computer Science

Indian Institute of Technology, Kharagpur, India — July 2019 — May 2024
BSc. (Hons) + MSc. in Mathematics & Computing — Department Rank: 2 (class size 63)
Micro Specialization in Artificial Intelligence and Applications — Overall GPA: 9.45/10.00

PROJECTS + RESEARCH EXPERIENCE

Graduate Student Researcher — *Academic Supervisor: Prof. Bryan Wilder*
Carnegie Mellon University - Pittsburgh, USA — August 2024 — Present

- **Neural Lifting** (*Submitted for review*)[Code]—***Collaborators: Prof. Pradeep Ravikumar, Chandler Squires***. A novel methodology that enables small models to benefit from temporary overparameterization during training. Project funded by Defense Advanced Research Projects Agency (DARPA).
- **Distributionally Robust Variable Selection** (*Ongoing*)—***Collaborators: Prof. Bryan Wilder & UPMC***. Novel method for variable subset selection to guide personalized interventions for preventing post-natal pregnancy. Project funded by the National Institute of Mental Health (NIMH).

Internship — *Mentor: Dinesh Katiyar, Accel Ventures*
Briza - California — June 2024 — August 2024

- Fine-tuned LLMs to provide precision healthcare advice, in particular to the South Asian demographic.

Research Internship — *PI: Prof. Dhanya Sridhar*
Mila - Quebec AI Institute, Montreal, Canada — May 2023 — May 2024

- **Poster: Learning Macro Variables with Auto-encoders**,*Maitreyi Swaroop, Eric Elmoznino, Dhanya Sridhar.* (Accepted at *NeurIPS 2023 Workshop on Causal Representation Learning*).[Code]
- Proposed **DeepCFL**: a self-supervised method that learns macro variables and their relations, and both satisfies and extends the desiderata of Causal Feature Learning.
- Designed and conducted experiments using `pytorch` on a dataset of handwritten English and Kannada digits.

Masters Thesis Project — *PI: Prof. Partha Pratim Chakrabarti*
Indian Institute of Technology, Kharagpur, India — May 2023—May 2024

- Developed hybrid methods of approximation algorithms, heuristics and RL-methods to solve routing problems. This includes a new divide-and-conquer approach using an RL model to solve the subproblems, the answers of which are combined and used as input to the Lin Kernighan $k-$opt solver.

Research Internship — *PI: Dr. Manuel Gomez Rodriguez*
Max Planck Institute for Software Systems, Kaiserslautern, Germany — May 2022—July 2022

- Formulated a threshold test which takes into account the intersectionality of traits to identify biased decision-makers. We used a Dirichlet-Process Mixture Model (DPMM) for data generation process and MCMC methods for inference. Implementations were in the R programming language.

EXPERIENCES + ADDITIONAL PROJECTS

Google Research Week— *Google Research, Bangalore, India* — February 2024

IIT Delhi Theoretical Computer Science Winter School —*Indian Institute of Technology Delhi* — December 2022

Solving Illustrative Examples for Data Science Textbook — December 2020- May 2021
(Remote) Indian Institute of Science (IISc.) Bangalore

- Collaborated with Prof. Ramesh Hariharan and Prof. Rajesh Sunderesan on developing solutions for their Data Science textbook, focusing on astronomical calculations to determine Earth and Mars orbital parameters using Tycho Brahe's historical dataset—the same data employed by Kepler in formulating his laws of planetary motion.

Awards & Honours

- **Indian Academy of Sciences (IASc) Summer Research Fellowship** I was offered the IASc-INSA-NASI Summer Research Fellowship in 2021, for a two-month long project at the Indian Institute of Science Education & Research (IISER), Kolkata. I could not participate in the program due to the pandemic.
- **INSPIRE Scholarship for Higher Education (SHE)** I ranked in the top 1% of the Indian School Certificate board's Class XII exam, qualifying for the INSPIRE Scholarship for Higher Education.