Arshika Lalan

alalan@cs.cmu.edu +1 412-909-5513 Homepage Google Scholar

Education

Carnegie Mellon University *December 2025*

Masters of Science in Machine Learning

Current courses(PhD): Advanced Introduction to Machine Learning, Intermediate Statistics, Deep Reinforcement Learning and Control, Multimodal Machine Learning, Probabilistic Graphical Models, Convex Optimization

Birla Institute of Technology And Science (BITS), Pilani *July 2022*

Bachelors of Engineering, Computer Science and Masters of Science, Economics

Work Experience

Google DeepMind (Previously Google Research) *Aug 2022 – Jun 2024*

*Researcher in Multi-Agent Systems for Societal Impact (MASSI) Lab: Full-time **2 years*** *Bangalore, India*

- Showcased non-Markovian behavior (complicating adoption of prior SoTA Markovian RMAB systems) in the largest maternal mobile health program with 3.2 million active beneficiaries. **[KDD-WS'23]**
- Co-formulated novel non-Markovian Time-Series Restless Bandits for optimizing multiple interventions by developing a framework leveraging reinforcement learning to increase the program's engagement.
- Demonstrated ability for the policy to increase content exposure of cohort by 57% and preventing dropouts by 33% over a random policy. **[AAAI'24]**

Harvard University *Aug 2021 – Jul 2022*

*Research Assistant in Kreiman Lab: Full-time **1 year*** *Boston, MA*

- Investigated interplay between catastrophic forgetting (CF) and OOD generalization ability using 3D modeling and examined adaptability of continual learning algorithms to continuous domains.
- Demonstrated that models exhibit a saturation point in performance with respect to CF and generalization as number of tasks increases. **[Thesis]**

Microsoft *May 2021 – Jul 2021*

Software Development Intern in Cloud+Artificial Intelligence team *Hyderabad, India*

- Built an End-to-End service providing user insights to reporting services of the Playwright tool.

Selected Publications and Thesis

1. **Improving Health Information Access in the World's Largest Maternal Mobile Health Program via Bandit Algorithms.** ***Oral Presentation*** *@ The Association for the Advancement of Artificial Intelligence Conference [Track: IAAI] 2024.* **[AAAI'24]**
2. **Analyzing and Predicting Low-Listenership Trends in a Large-Scale Mobile Health Program: A Preliminary Investigation.** ***Oral Presentation*** *@ Data Science for Social Good Workshop, KDD 2023.* **[KDD-WS'23]**
3. **Adherence Bandits.** *Artificial Intelligence for Social Good Workshop, AAAI 2023.* **[AAAI-WS'23]**
4. **Continual Learning and Out Of Domain Generalization in Continuous Domain Adaptation.** **[Thesis]**

Selected Projects

- **Incentive Mechanisms for LLM-Assisted Textual Data Integrity:** Working under Prof. Nihar Shah to design mechanisms to counter LLM assisted responses in feedback platforms, such as peer reviews. *Present*
- **Multimodal Reasoning in Text and Videos:** *(11-777 Course Project)* Exploring reasoning approaches across text and video modalities using the STAR dataset. Investigating transformer-based techniques to enhance multimodal understanding. *Present*
- **Constrained Output Optimization for GPT-2:** Implemented Greedy Coordinate Gradient (GCG) to optimize prompts for keyword-specific outputs on GPT-2 under strict token-length constraints. *Jan 2024*

Key Accomplishments and Experience

- Cleared Regional Mathematics Olympiad (RMO); Qualified for Indian National Mathematics Olympiad (INMO).
- Teaching Assistant for: Deep Reinforcement Learning and Control (CMU), Object Oriented Programming (BITS), Database Systems (BITS), Econometric Methods (BITS).

Skills

Frameworks and libraries: Pytorch, Sklearn, Numpy, Pandas, React
Programming Languages: Python, Java, C++, R, Stata
AI/ML Frameworks and Models: Diffusion Models, Transformers, Generative AI, Reinforcement Learning