Atharva Amdekar

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Personal Website
GitHub

Education

- **Stanford University** — Stanford, California
  M.S. - Computational and Applied Mathematics — *September 2021 - Present*
  Courses for 2021-22: *Machine Learning System Design, Natural Language Processing with Deep Learning, Deep Generative Models, Advanced Software Development, Deep Learning for Computer Vision, Convex Optimization*
- **Indian Institute of Technology, Guwahati** — Guwahati, India
  Bachelor of Technology - Mathematics and Computing — *July 2016 - June 2020*
  Key Courses: *Data Structures and Algorithms, Optimization, Probability Theory, Operating Systems, Generalized Linear Models*

Publications

- **MoCa: Cognitive Scaffolding for Language Models in Causal and Moral Judgment Tasks**
  Allen Nie, Atharva Amdekar, Chris Peach, Tatsunori Hashimoto, Tobias Gerstenberg

Experience

- **Amazon** — *Seattle, Washington*
  Applied Scientist Intern — *June '22 - September '22*
  - Owned an end-to-end service that leveraged state-of-the-art permutation invariant Transformers and Graph Neural Networks to refine the knowledge graph that supports the Amazon Catalogue System.
  - Worked on the problem of broken variation by modeling it as a hyperedge prediction problem in a heterogeneous hypergraph, and trained various deep networks to push to production.
- **Stanford Artificial Intelligence Laboratory (SAIL)** — *Stanford, California*
  Graduate Research Assistant — *September '21 - May '22*
  - Devised novel Deep Generative Modeling techniques using score matching for representation learning in JAX.
  - Worked on domain-agnostic self-supervised learning using Masked AutoEncoder in Pytorch.
- **iRage Capital Advisory Private Limited** — *Mumbai,India*
  Quantitative Researcher (Full-time) — *June '20 - July '21*
  - Devised novel high-frequency trading strategies in Python using ideas borrowed from Machine Learning.
  - Developed a framework using Elasticsearch, Kibana, and Logstash to analyze high-frequency financial data.
- **Hanyang University** — *South Korea*
  Research Intern, Guide: Prof. Frank Chung-Hoon Rhee — *May '18 - July '18*
  - **Clustering in the Framework of Shadowed Sets**: Proposed a novel Type-2 Shadowed C-means clustering algorithm (SCM) which constructed Type-2 Shadowed Fuzzy Sets to solve the inherent problems of Type-1 SCM.

Projects

- **Unsupervised Concept-based Explanations for Sentiment Analysis**
  Course Project, Natural Language Understanding — *May '22*
  - Compared the concept-based interpretability methods to black-box model predictions and observed the coherency of discovered concepts in the interpretable model suffers from lack of coherency.
- **Score-based Generative Models**
  Course Project, Deep Generative Models — *December '21*
  - Conducted theoretical and empirical experiments to show that a multi-sample denoiser improves the performance of a Diffusion Model based on a Score Matching training objective.
- **Application of Reinforcement Learning in Financial Portfolio Optimization**
  Bachelor's Thesis Project, Guide: Prof. N. Selvaraju, IITG — *August '19 - April '20*
  - Automated dynamic portfolio optimization using Deep Q-Learning and Deep Deterministic Policy Gradient.
  - Implemented CNNs for the value function and policy approximation generating a continuous sequence of trades.

Skills Summary

- **Languages**: Python, C++, Bash, React, Javascript
- **Statistical Packages**: R, MATLAB
- **Tools and Libraries**: Pytorch, JAX, Haiku, Pandas, Numpy, Git, Elasticsearch, Logstash, Kibana

Scholastic Achievements and Extracurriculars

- Secured a scholarship from London School of Economics for securing Department Rank 1 in July-Nov 2016 semester.
- Achieved 99.76 percentile in JEE Main 2016 among 1.3 million candidates.
- Published an article in Ela Foundation magazine with renowned ornithologist Dr.Satish Pande reporting the record of an Indian Skimmer, a rare passage migrant, to Pune City.
- Secured State Rank 2 in a competitive Abacus competition organised by SIP Academy India.