Adithya Iyer

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EDUCATION

Courant Institute of Mathematical Sciences - New York University New York, NY
Masters in Computational Science *Aug 2022 - May 2024*
Courses Undertaken: *Large Language Models, Machine Learning, Numerical Methods*

Indian Institute of Technology Bombay Mumbai, India
Dual Degree(Btech+Mtech) in Materials Science *Jul 2016 - May 2021*

EXPERIENCE

eBay Inc. May 2023 - Aug 2023
Applied Researcher Intern *Seattle, WA*
- Designed a combination methodology for **unsupervised behavioral embeddings** as features into a pre-existing XgBoost model to predict fraud; achieved a **5 % points** AUC boost by including unsupervised embeddings.
- Finetuned a pretrained **contrastive loss based transformer** model on Acount Take-Over(ATO) fraud labels; improved embedding only classifier AUC by **6 % points** across Browser/Mobile Web channels.
- Built **30+ models** across **3 device channels**; identified best model based on precision-recall metrics.
- Performed **swap-sets** analysis for different time periods to quantify benefits of updated model in fraud detection.

NYU-x, Computer Vision Lab - Link Jan 2023 - Present
Research Assistant, guide: Prof Saining Xie *NYC, NY*
- Setup **TPU** infrastructure, parallelized training and replicated Diffusion Transformer**(DiT)** based Denoising Diffusion Probabilistic Model **(DDPM)** on **v4** TPU pods using Jax/Flax framework on **Imagenet** Dataset.
- Conducted experiments to speedup model training, including using pre-trained weights and auxiliary losses.
- Envisioned and implemented **TreeDiT**: a diffusion timestep based **Mixture of Experts** (MoE) Diffusion Transformer model to speedup training by 20% and inference by 35% with minimal impact on FID.
- Replicated Image Generation and Classification via Single Energy-Based **(EGC) Model (Link) in Jax**.
- Current research focus involves using diffusion models for **self-supervised** representation learning.

McKinsey & Company, Risk Dynamics Group Jul 2021 - Mar 2022
Associate Consultant *Delhi, India*
- Automated the **credit underwriting process** for the Self-Employed customer segment for a major Indian banking client; created systems to underwrite portfolio worth **60+ mil USD** annually.
- Built **5+** qualitative and quantitative models in **R** from bureau, deposits, bank statements and financial sources.
- Conducted workshops for historical data collection, ensured population stability of variables and executed complete **on-ground implementation** of models; model to be used by **100+** credit underwriters.

PROJECTS

Text2KnowledgeGraph - (Website), Github Sep 2023 - Dec 2023
Course: Large Language and Vision Models *NYU Courant*
- Built a website which uses **GPT4** API to summarize any input into an interpretable knowledge graph.
- Added capability to summarize inputs such as Youtube Videos, PDFs, web-pages and txt files to trees.
- Built a LLM enabled DFS algorithm - allowing GPT-4 to traverse graphs and answer questions.

Structure-Property Relations from Microstructural Images - Thesis, Paper Jul 2020 - May 2021
Master's Project: Guide: Prof. M P Gururajan and Prof. Hina Gokhale (IIT Bombay) *IIT Bombay*
- Awarded **Undergraduate Research Award (URA3)** for excellence in research by the Dean.
- *MIST (MIcrostrusture STatistics): A open source library in Python for the analysis of anisotropic microstructures*: **paper accepted for publication**, library can be found **here.**

TECHNICAL SKILLS

Computation related courses: Optimisation, Data Analysis, Algorithms, Numerical Methods, Machine Learning, Deep Learning, Stochastic Processes, Computer Vision, Large Language Models, Cloud and ML

Programming Skills/Software Packages: Python, PyTorch, Jax/Flax, Node.js, React, R, MATLAB, LaTeX, MongoDB, Git, TypeScript, Django, SQL, TensorFlow, Docker, Kubernetes, GCP