Nishaanth Kanna Ravichandran

Email: nishaanthkanna@gmail.com Website: nishaanthkanna.github.io GitHub: //nishaanthkanna

Education University of New Brunswick

NB. Canada

Masters in Computer Science

September 2022 – December 2023

Relevant Courses: Machine Learning (A+), Natural Language Processing (A+)

GPA: 3.8

PSG College of Technology

TN, India

Bachelors in Computer Science & Engineering

June 2017 - May 2020

First Class

Publications On the Fairness Impact of Hardware Selection in Machine Learning

S.H. Nelaturu*, **Nishaanth Kanna R.***, C. Tran, S. Hooker, F. Fioretto *Accepted at (ICML), 2024.* * - Equal Contribution

Investigating Continual Pretraining in Large Language Models: Insights and Implications

Çagatay Yildiz, **Nishaanth Kanna R.**, Prishruit Punia, Matthias Bethge, Beyza Ermis *Submitted at (CoLLAs)*, 2024.

Neural MMO 2.0: A Massively Multi-task Addition to Massively Multi-agent Learning

J. Suarez, D. Bloomin, K.W. Choe, H.X. Li, R. Sullivan, **Nishaanth Kanna R.**, D. Scott.... *Neural Information Processing Systems* (**NeurIPS**), 2023 Datasets and Benchmark Track

Research experience

On the Fairness Impact of Hardware Selection in Machine Learning

Mentors: Dr. Sara Hooker (Cohere For AI) November 2022 – January 2024 & Prof. Ferdinando Fioretto (University of Virginia)

- We conducted a comprehensive study to investigate the uneven impact of hardware tools on model precision and fairness among diverse sub-groups (Age, Ethnicity, Gender etc.).
- Through extensive experiments (3000+ models trained) across different hardware setups, datasets, and model categories, our research unveiled disparities primarily driven by threading, affecting fairness. We proposed a mitigation solution and our work was accepted to ICML 2024.

Keywords: Loss surfaces, Understanding ML models, Fairness, PyTorch, GCP.

Investigating Continual Learning in LLMs

Mentor: Dr. Beyza Ermis (Cohere For AI)

March 2023 – February 2024

- This project involved benchmarking several pre-trained LLMs on their forgetting, backward and forward transfer properties in a Continual-Learning scenario across multiple domains in the M2D2 Dataset.
- Built a **RAG pipeline** on the M2D2 Dataset, simulating a CL scenario. Built **FAISS**Indices with **25M Vectors**, experimenting with different index algorithms.

Keywords: Continual Learning, Retrieval-Augmented Generation, FAISS, Robustness, Domain Adaption, OOD Generalization, HuggingFace.

Studying Open-Ended Curriculum Generation with LLMs for RL Agents

Mentors: Herbie Bradley (Carper AI, Univ. of Cambridge) February 2023 – August 2023 & Joseph Suárez (MIT)

- **Primary contributor** in Integrating Carper AI's OpenELM (Evolution through Large Language Models) with Neural MMO RL Environment.
- Experimented with QD Algorithms (MAP-Elites) to generate a Diverse set of Curriculum to improve generalization of standard RL Algorithms.
- Worked with different Code LLMs and improved them with data set collection, quantization and finetuning on several A100 GPUs. Accepted at NeurIPS 2023
 Datasets and Benchmark Track

Keywords: LLMs for Curriculum Generation, Quality Diversity, Evolutionary Computation, Finetuning and Quantizing LLMs, PyTorch, HuggingFace.

Industry Four Eyes Financial, Data Team

Saint John, NB

ML Engineer

Jan 2024 - Present

- Building custom text embedding solutions using Large Language Models to efficiently match Financial Securities

Cohere For AI Remote

Community ML Researcher Nov 2022 - March 2024

Intel Corporation, Data and Analytic Division

Bengaluru, India

Data Engineer

June 2020 - Dec 2021

Undergraduate Internship

Jan 2020 - May 2020

Teaching experience

University of New Brunswick Department of Computer Science

NB, Canada

Teaching Assistant for Data structures and Algorithms

Sept. 2023 - Dec 2023

Certification AWS Machine Learning Speciality - 2024

Coursera Deep Learning Specialization

Skills Languages: Python, Java, SQL (Microsoft SQL), Shell Scripting (Linux), HTML/CSS

Tools: Git, Docker, Google Cloud Platform

Libraries: TensorFlow, PyTorch, Pandas, NumPy, HuggingFace Transformers