Nishaanth Kanna Ravichandran

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