Muhammad Adil Asif

+1 437 778 4636 | adil.asif2000@hotmail.com | https://github.com/adil-a | https://www.cs.toronto.edu/~adilasif/

Education

University of Toronto September 2019 – June 2023
Honours Bachelor of Science in Computer Science *Toronto, Canada*
Last Two Years GPA: 3.96/4.00 Overall GPA: 3.89/4.00
Dean's List 2022 - 2023 / 2021-2022 / 2020-2021. New College In-Course Scholarship 2022

Papers

- Younwoo Choi*, **Muhammad Adil Asif***, Ziwen Han, John Willes, Rahul Krishnan. Teaching LLMs How To Learn with Contextual Fine-Tuning. In *International Conference on Learning Representations (ICLR), 2025* and *Advances in Neural Information Processing Systems (NeurIPS) FITML Workshop*, 2024.
- Matthew Choi, **Muhammad Adil Asif**, John Willes, David Emerson. FlexModel: A Framework for Interpretability of Distributed Large Language Models. In *Advances in Neural Information Processing Systems (NeurIPS) SoLaR Workshop*, 2023. **Spotlight**.
- Maria Attarian, **Muhammad Adil Asif**, Jingzhou Liu, Ruthrash Hari, Animesh Garg, Igor Gilitschenski, and Jonathan Tompson. Geometry Matching for Multi-Embodiment Grasping. In *Conference on Robot Learning (CoRL)*, 2023.

Work Experience

Associate Applied Machine Learning Specialist May 2023 – Current
Vector Institute, LLM Infrastructure Team | PyTorch · Bash · Git · SLURM *Toronto, Canada*
- I am working with the **UK AI Safety Institute** to extend the benchmark coverage of their `Inspect` framework, where I am a **top 5** contributor.
- I contributed to the development of `Kronfluence`, an open-source implementation of **influence functions for LLMs**. I am currently doing research on guided LLM generation under Roger Grosse.
- I developed `VectorLM`, an open source package for optimized **distributed training** of LLMs up to **13B parameters** in resource-constrained environments. This tool is now being used by ∼**50 researchers**. Our tests showed that `VectorLM` can achieve a **20x** training throughput improvement using the same hardware, improving from **180 tokens/GPU/s to 3,750 tokens/GPU/s**.
- Contributed to developing `FlexModel`, a tooling software package for the interpretability of distributed LLMs. `FlexModel` received a **spotlight at the SoLaR Workshop, NeurIPS 2023**.

Deep Learning Student Researcher May 2022 – September 2023
Vector Institute & UofT, Igor Gilitschenski's Group | PyTorch · Bash · Git · SLURM *Toronto, Canada*
- I researched techniques to predict **grasp poses on novel objects using robot arm end-effectors**. This project was done in collaboration with **Google DeepMind** resulting in a paper accepted to **CoRL 2023**.

Applied Machine Learning Intern January 2022 – September 2022
Vector Institute | PyTorch · JAX · Flax · Optax · Bash · Git · SLURM *Toronto, Canada*
- I benchmarked models in different deep learning domains using PyTorch's benchmarking suite on several GPUs (e.g. A100s, A40s, etc.). The results were used to make an informed decision regarding the upgrade of ∼**150 of Vector's GPU machines**, determining the most cost-effective GPU options.
- Setup a synthetic datasets bootcamp for Vector's sponsors that consisted of providing support for **14 sponsor companies**.

Deep Learning Student Researcher May 2021 – December 2021
Vector Institute & UofT, Roger Grosse's Group | PyTorch · W&B · Bash · Git · SLURM *Toronto, Canada*
- Researched how overparameterization interacts with network pruning and generalization capabilities. I was responsible for running empirical experiments using different pruning algorithms to get ResNet-20 to perform nearly **4% better** than its baselines on CIFAR-100 with **98% of the weights pruned**.

Data Science Intern September 2020 – March 2021
G42 | PyTorch · scikit-learn · Ray Tune · pandas · Bash · Git · SLURM *Abu Dhabi, UAE*
- I developed the training/testing pipeline for a CNN model by tuning the fully connected layers of a ResNet model to detect Pulmonary Embolism in the lungs using CT scans.
- I lead a project to predict the onset of Sepsis in patients up to 6 hours before using an XGB model to achieve **0.85 AUROC/95% accuracy** scores on the test dataset.