Aly Shariff

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Education

University of Waterloo **2023 – Present**
Bachelor of Computer Science + Physics Minor - 93.80 Cumulative Average (3.98 GPA) *Waterloo, ON*

Experience

University of Waterloo (Prof. Greg Rice) **January 2025 – Present**
Machine Learning Researcher *Waterloo, ON*

- Developing **statistical/XAI methods** for evaluating real-time forecasting models for NFL game predictions.
- Creating an **ML model** to beat current prediction accuracies, with **paper publication by Summer 2025**.

TD Bank - TD Invent Enterprise Innovation **May 2024 – August 2024**
Software Engineer Intern *Toronto, ON*

- Developed a personal finance simulator in Python using **Monte Carlo methods** and **Q-Learning**, optimizing decision-making strategies with a **50% increase** in total net worth across 1,000+ simulated scenarios.
- Developed a **phishing detector** (fine-tuned **BERT** model), with **97% accuracy**, leveraging **Explainable AI**. Project was deployed to **Microsoft Azure** as an **Outlook add-in**. Demoed to the Head of Enterprise Innovation at TD.
- Developed a **RAG-powered chatbot** using **GPT-4** and **Pinecone** for efficient document retrieval and Q&A. Deployed on **Azure**, enabling real-time assistance for **10K+ employees**.

University of Waterloo (Prof. M. Crowley) **March 2024 – Present**
Reinforcement Learning Researcher *Waterloo, ON*

- Using Q-Learning and Proximal Policy Optimization to build an FPS player agent in Doom, pending paper publication.
- Training **Vision Transformers, Mamba, and Decision Transformers** to beat current state-of-the-art models.

DoorHan International **March 2023 – August 2023**
Software Engineer *Remote*

- Designed an automated cross-platform quote delivery software that reduced the delivery times by **80%**.
- Developed an admin dashboard **using React** to streamline contractor management, **increasing sales by 10%.**
- Developed a **React Native app** with online/offline support that generates automated quotes with pricing calculations.
- Developed a **NodeJS and Express backend with a PostgresSQL database** for cross-platform communication.

Co-Founder and CEO **June 2020 – August 2022**
AXYAS Tutoring Service *Montreal, QC*

- Generated **$45K in sales** in 2 years, and managed **50 student tutors** who helped over **100 satisfied students**.

Projects

Artificial Sign Language (International Science Fair Project, $15K+ in awards) | *Tensorflow, OpenCV, C++*

- **1 of 8 teams to represent Canada for ISEF 2023 in Dallas**. With Prof. Sahraoui at Université de Montréal.
- Trained and tested **LSTMs and CNNs** for sign language to English translation with custom augmented dataset.

Re.live (1st place Cohere Prize @ UofT Hacks, $1,500 in prize) | *React, Cohere, Azure, OpenCV, Mediapipe*

- **Stable diffusion** to make static images of people dance. **Cohere RAG backend** to select songs based on user mood.

DriveSense (Hack The North Finalist) | *Python, OpenCV, Django, React Native, YOLOv5, JavaScript*

- **AI-powered app** that uses computer vision to assess the driving quality of individuals for insurance valuation.
- Used **YOLOv5** for real-time detection of car plates, traffic signals, and analysis of road conditions and nearby vehicles.

Vm (Vim from scratch) | *C++*

- Built a **vim-like text editor from scratch** with C++ and NCurses. Designed the application with **MVC** principles.
- Implemented basic and advanced features, including insert/command mode, unlimited undo operations, and macros.

Galaxy Generator | *Python, PyTorch*

- Built a **diffusion model from scratch** based on this paper to generate images of galaxies, given physical properties.
- **VAE** for image compression, **Cross-Attention + U-Net** for conditioning and denoising. **KL-Divergence** for loss.

Skills

Programming Languages: Python, C++, JavaScript, R, Bash, HTML/CSS, C, Racket, SQL, TypeScript
Frameworks: PyTorch, Tensorflow, NumPy, SK-Learn, Pandas, OpenCV, React, Flask, Django, Node.js
Other: CUDA, Docker/Kubernetes, Git, GCP, Azure, AWS, Firebase, Langchain, Pinecone, MongoDB, Postgres, Vim