

EDUCATION

University of Toronto

Sep 2022 - Expected June 2026

Honours B.Sc. in (Co-op) Computer Science and Neuroscience; **cGPA: 3.96/4.0** | TA: Python, Probability, Discrete Mathematics

EXPERIENCE

Applied Machine Learning Engineer | Vector Institute

Jan 2024 - Present

- **First-authored** a research paper at **NeurIPS ML4H 2024**, [vectorinstitute.github.io/EHRMamba](#), under review, introducing EHRMamba, a **state-of-the-art foundation model** for scalable modeling of Electronic Health Records.
- Developed **EHRMamba**, the first model to excel in both EHR forecasting and 6 clinical prediction tasks, using a scalable architecture that processes **300% longer patient histories** with **38% higher compute efficiency**, accelerating AI integration in healthcare systems.
- Engineered **Odyssey**, a pioneering **open-source toolkit** for **full-stack EHR modeling**, encompassing novel medical data tokenization, **PyTorch-based Transformer** and **Mamba** architectures, and robust tools for EHR forecasting, clinical prediction, and interpretability.

Machine Learning Researcher | INSERM, France

July 2023 - September 2024

- Engineered **CodonTransformer**, a state-of-the-art model with **2,000+ downloads** that optimizes DNA sequences for protein expression in **164 organisms**, trained on a dataset of **1,000,000+ gene-protein** pairs with **PyTorch Lightning**.
- **First-authored** a manuscript at **Nature Communications**, [adibvafa.github.io/CodonTransformer](#), under review, showcasing estimation to **save \$5,000,000+** with CodonTransformer in vaccine manufacturing and protein production.
- Built the **largest open-source library** with **88+ GitHub stars** for codon optimization, providing a full-stack machine learning pipeline.

Computer Vision Researcher | BorealisAI

March 2024 - May 2024

- Developed a pioneering **image-to-text multimodal AI system** ([github.com/Adibvafa/RadioCareBorealisAI](#)), for chest X-ray radiology report generation, tackling critical healthcare accessibility gaps for **3.8 million rural Canadians**.
- Architected a cutting-edge **medical imaging model** by integrating **Vision Transformer**, **BLIP**, and **GPT** technologies, leveraging over **377,000 chest x-ray images** to surpass previous benchmarks with an **86.27% precision** and **83.28% F1-score**.

PROJECTS

UnsearchableTO | New Builds Hackathon | [GitHub](#) [Website](#) [Twitter](#)

Python, Next.js, FastAPI, Gemini

- Made the entire city of Toronto searchable with over half a million objects using **Python**, **Next.js**, **FastAPI**, Gemini, and Cohere API.
- Reached **32,000+ views** on X, **2,000+ user queries**, and **14,000+ searched locations** in 2 days after launch.

Vector Institute's Cyclops: Stroke Prediction | [GitHub](#) [Kaggle](#)

TensorFlow, Scikit-Learn, Pandas

- Enhanced Cyclops, a **100,000+ line ML toolkit for healthcare** research, by resolving critical deployment issues in non-Linux machines.
- Authored a **Kaggle tutorial (3,000+ views)** on Cyclops for stroke prediction with **90% accuracy** using **TensorFlow**, **Sklearn**, & **Pandas**.

Hugging Face Contributor | [GitHub](#)

NLP, Open-source Development

- Integrated attention-hybrid Mamba2 models into **Hugging Face's Transformers** library, the industry-standard open-source library for **Natural Language Processing (NLP)**, expanding the library's cutting-edge offerings for **millions of AI practitioners** worldwide.

LEADERSHIP

Founder & Lead | Google Developer Student Club (GDSC)

Aug 2023 - Present

- **Founded [GenAI Genesis](#)**, Canada's largest AI hackathon, with 1,200+ applicants from 10+ countries, sponsored by **Google**.

CERTIFICATES

Machine Learning & Deep Learning Specializations | Coursera, DeepLearning.ai, Stanford Online

2023

- Aced 8 courses in **Natural Language Processing**, **Computer Vision**, and **Reinforcement Learning** using **TensorFlow** and Keras.

International Biology Olympiad - Silver Medal | 32nd IBO, Lisbon, Portugal

2021

- Achieved **Silver Medal** in the **world's most prominent biology competition** among 300 students from 72 countries.

SKILLS

Languages

Python, Java, C/C++, HTML, CSS, JavaScript, TypeScript, SQL, Assembly, Shell, Bash

Frameworks

PyTorch, TensorFlow, Keras, Hugging Face, JAX, FastAPI, React, Next.js, OpenCV, XLA, NumPy, Pandas, Scikit-Learn

Tools & Cloud

GCP, AWS, Azure, CUDA, SLURM, Git, MySQL, Firebase, Supabase, MongoDB, Unix, Linux, PowerBI, Vercel, Jupyter