

## EDUCATION

### MSc in Applied Computing

Sept 2022 – Dec 2023

University of Toronto, Department of Computer Science

*Artificial Intelligence Concentration*

Courses: CSC2559 Trustworthy ML, CSC2552 Topics in Computational Social Science, CSC2231 Visual and Mobile Computing Systems, and CSC2545 Advanced Topics in ML – Causal Learning

### Bachelor of Computing (Honors)

Sept 2018 – June 2022

Queen's University of Kingston, Department of Computer Science

*Artificial Intelligence Specialization*

4.16 GPA

## WORK EXPERIENCE

### Princess Margaret Cancer Centre – UHN

Jan 2024 - Present

Research Analyst

- Continuing research with GNNs and large language models for drug discovery.
- Collaborative environment provided me with the opportunity to mentor rotation students and engage in project management for shared works.

Co-op Master's Student (Intern)

May 2023 – Dec 2023

- Worked on project to improve precision oncology using GNNs (see *MutDTA* below)
- Learned effective communication skills through presentations in the lab and outside which included a final poster presentation for ARIA. Currently working on a paper for publication.

### Vancouver Prostate Centre - UBC Lab

Aug 2020 – Dec 2021

(On and off between part-time and full-time)

Undergraduate Academic Assistant

- Helped to improve the performance of the Deep Docking model designed to accelerate the drug discovery process. This included optimizing code to run up to 3x faster and improving the model's architecture to be more accurate.
- Co-led the design and development of a GUI web application that made Deep Docking more accessible.
- Helped review and write papers for publication.

## NOTABLE PROJECTS

### UofT MScAC Thesis Project - MutDTA

May 2023 – Dec 2023

*GNNs with Protein Dynamics for Enhanced Drug Targeting* - [github.com/jyaacoub/MutDTA](https://github.com/jyaacoub/MutDTA)

Project to improve precision oncology for cancer patients. Researched, designed, and iterated on models under limited resources requiring creative solutions to overcome with distributed multi-node computing. Additionally, leveraging ESM-2 foundation protein language model to improve prediction results.

### CSC2231 – Visual and Mobile Computing Systems Project

Winter 2023

*Federated Learning Vision Transformers* - [github.com/jyaacoub/FL-ViT](https://github.com/jyaacoub/FL-ViT)

Optimizing the performance of Vision Transformers under a federated learning environment. Implemented in python using [flower](https://flower.dev/) library to perform distributed training under simulated and real-world conditions with clients containing varying levels of processing power.

### CSC2559 – Trustworthy ML Project

Fall 2022

*Cross-Domain Attacks in NLP* - [github.com/jyaacoub/Cross-Domain-Attacks-NLP](https://github.com/jyaacoub/Cross-Domain-Attacks-NLP)

Research into transferability of adversarial examples across problem domains in NLP to get a better understanding of the intuition behind their existence in NLP. We found that transferability across domains was weak, signaling that adversarial examples come from high level features of language similar to CV which arise from “non-robust features”.

### OpenAI Hackathon for Climate Change

Fall 2022

*Net Zero AI* – [github.com/jyaacoub/CSR\\_summarizer](https://github.com/jyaacoub/CSR_summarizer)

Nov 11-14

Led a team in developing a simple tool to create meaningful summaries from lengthy Corporate Social Responsibility reports. I recruited people, organized, and divided up tasks. I did the backend programming; utilizing the OpenAI APIs to perform semantic search and summarization with GPT-3.

## TECHNICAL SKILLS

**Languages:** Python, JavaScript, Java, C, and MATLAB.

**Machine Learning:** PyTorch, pytorch-lightning, torch\_geometric, Scikit-learn, Matplotlib, Pandas, etc...

**HPC and Distributed Learning:** SLURM, Ray[Tune, Train], Flower