

Alan Yuan

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EDUCATION

University of Toronto

3.82 cGPA

BSc Computer Science Specialist, Major in Mathematics

Sep. 2018 – May 2023

Relevant Coursework: Data Structures and Algorithms (A+), Operating Systems (A+), Parallel Programming (A+), Neural Networks and Deep Learning (A+), Intro to AI (A+), Introduction to Machine Learning (A+), Algorithm Design, Analysis & Complexity (A)

RESEARCH PROJECTS

PAIR lab assistant | Private repo (paper under review RA-L - IEEE)

Sep 2021 – present

- Built on top of **NVIDIA's** Isaacsim to create a robot reinforcement learning **benchmark**
- Implementing a task-flow and environment randomizer for **causal reward** based research
- Creating physics scenes and testing **reinforcement learning** algorithms to be used as a benchmark
- Utilize **PyTorch** and **PPO** implementations such as **rsrl**, **rlgames** and **rllib**
- Setup and trained a variety of robots including **frankas** and **mobile manipulators**

CaNetDa: Deep learning for GeoGuesser in Canada | Link: GitHub

Jan 2021 – April 2021

- Utilized a deep learning approach utilizing multiple deep learning techniques to have an AI play GeoGuesser.
- Utilized a **PyTorch** implementation of **ResNet**, **EfficientNet** and **Vision Transformer** to predict the location
- With our approach, a accuracy of **60%** was consistently achieved out of 13 options

Introduction to Machine Learning course competition | Link: GitHub

Sept 2020 – Dec 2020

- Achieved the 5th highest score in the competition and a 99% on the project write-up.
- Chose and implemented a Matrix Factorization SGD algorithm to recommend a selection of movies to users.
- Improved on the SGD training process by adding weight regularization and biases based on research papers
- Used ensembles to decrease variance ensuring the private score will be similar to that of the validation set.

WORK EXPERIENCE

Amazon

May 2022 – Aug 2022

Software Developer - Intern

Vancouver, British Columbia

- Engineered a microservice in **Java** to send notifications to **100mil+** customer of cashback on select products
- Ensured modularity by designing a plugin system for processing the customer orders for microservice
- Utilize **AWS** webservice such as **Lambda**, **SQS** and **SNS** to ensure scalability of the notification system

Intel

May 2021 – May 2022

Software Engineer - Intern

Toronto, Ontario

- Developed flagship product using **C++**, **Python** and **Bash** for speedup by re-routing the compilation
- Developed support software to generate 4000+ of completely random test-cases for edge-case testing
- Optimized support tool's Ram templates to reduce false positives and failing cases by around **70%**
- Implemented various new features and upgrades such as re-scripting tools to utilized new control system, dynamic database size notifier, hierarchy re-router for missing entities, automatic parameter setting aggregator and more
- Migrated all 600+ failing regression test cases to the new compilation flow leading to decreased build failures

Centivizer

April 2020 - Sept 2020

Software Developer - Part-time

Toronto, Ontario

- Designed and wrote backend application using **Node.JS** and **SimplePeer** to connect users via video call
- Establish communication between client and backend for video feed using **socket.io**
- Integrated video feature with user database through **RESTful API** using the **Axios** Library
- Decreased server load by re-working notification system to use a socket based approach

PROJECTS

- Deep QLearning snake** | Link: GitHub May 2021 – present
- Utilized **PyTorch** to write a Deep Q-Learning algorithm
 - Played the snake game with DQL agent reaching a high score of **40** after **5** minutes of training
- CFR Minimization (Kuhn Poker, Tic-Tac-Toe and Coup)** | Link: GitHub May 2021 – July 2021
- Developing a general framework to find nash equilibrium using CFR, CFR+ and MCCFR
 - Implemented each of the algorithms to play tic-tac-toe and Kuhn poker
- Tenant-Landlord Matching App** | Links: server-side, client-side Aug 2020 – June 2021
- Fullstack development of an mobile application to match landlords and tenants
 - Constructed front-end using **React Native** and common packages such as **React Navigation** and **axios**
 - Features: Authentication, Images upload utilizing **multer**, Tinder-like swiping, instant messaging with **Socket.io**
 - Utilized **Node.js**, **GraphQL**, and database **Postgres** to construct backend
- Tron UDP multiplayer** | Link: GitHub Sep 2019 – Dec 2019
- Created a four player game for local networks using the **UDP** network protocol and C++
 - **Forked** timer from the server to ensure the game runs on time
 - Utilize **epoll** for both client and server to monitor the socket as well as the timer (server) and stdin (client)
- BF-interpreter** | Link: GitHub Mar 2018 – Nov 2018
- Built **interpreter** that runs BF in C
 - Reads user input in **real-time** as BF shell and reads BF files
 - Runs all example BF programs found on [wikipedia](https://en.wikipedia.org/wiki/Brainfuck)

TECHNICAL SKILLS

Languages: Python, C/C++, JavaScript, Java, C#, R

Tools: Git, React Native, Node.js, MongoDB, SQL (Postgres), PyTorch, Numpy, Pandas, GDB, GraphQL