Ryan Alizadeh

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I am a fourth year Engineering student at UofT, searching for a 4 month software internship starting in May 2024

EDUCATION

University of Toronto - *Engineering Science - 4th Year* Sep 2020 - May 2025

- Major in Machine Learning, Minors in Business and Robotics. 3.5 GPA.
- Coursework in Algorithms, Data Structures, Digital Systems, Operating Systems, Machine Learning, Optimization, Design, Computer Security, Robotics, Distributed Systems, Control Systems, Software Engineering
- Captain of intramural hockey team, Robotic Arm lead for UofT Robotics for Space Exploration, superstructure lead for Concrete Toboggan design team

SKILLS

- **Languages:** C/C++, Python, Java, JavaScript, TypeScript, MATLAB, Verilog, ARM Assembly
- **Machine Learning:** Tensorflow, PyTorch, Keras, Objax, NumPy, SciPy, Matplotlib, Scikit-learn, Pandas
- **Web:** SpringBoot, Kafka, React, Typescript, Redux, FastAPI, JWTs, Webflux
- **AWS**: Cloudformation orchestration, Serverless deployment with Lambda, SQS, SNS, Pinpoint, EC2, ECR, ECS, DynamoDB, S3 and more
- **Computer Security:** Software vulnerabilities/exploits, symmetric/asymmetric key encryption, Web Attacks, TCP/IP, Multi-Factor Authentication
- **Software**: Linux system-level software, containerization with Docker, performance monitoring with Prometheus

EXPERIENCE

Uken Games - *Software Engineer* May 2023 - November 2023

- Deployed and managed a containerized microservice platform for games played by millions of users daily
- Optimized CI/CD pipeline using containerization with Docker, reducing deploy times by over 90%
- Orchestrated core game services in AWS Cloudformation including authentication, A/B testing, and in-app purchases
- Added features and fixed bugs in SpringBoot applications, making extensive use of Kafka, Webflux, and Spring Data
- Set up observability on critical health metrics by provisioning alerts in Grafana, catching potential crises early enough to be prevented
- Worked with CI/CD tools including Jenkins, Docker, and Github Actions to automate repetitive workflows

UofT Robotics for Space Exploration Team - *Team Lead* Jun 2022 - Present

- Wrote control software in C++ and Python for robotic arm control and communication, enabling arm to complete coordination tasks
- Performed kinematic modeling on robotic arm and implemented solutions to inverse kinematic equations in Python

Rubicon Inc (Law Enforcement) - *Software Developer* May - Sep 2022

- Participated in meetings with clients to determine requirements for services and iterated upon feedback
- Developed linear regression models for traffic incident prediction in Python using scikit-learn
- Created online crime reporting tools in JavaScript and Python deployed on AWS serving over 20,000 users
- Protected sensitive data with JSON web tokens, exceeding privacy requirements for government data
- Participated in code review with senior developers to ensure code met high standards and best practices

UofT Racing Toboggan Design Team - *Superstructure Lead* Mar 2021 - Present

- Led design, prototyping, testing, and manufacture of racing toboggan superstructure, winning 2nd place overall in an international competition
- Directed integration of 7 subsystems comprised of more than 20 people into a coherent design,
- Co-authored series of 3 award-winning safety and technical reports for the toboggan

Performance Auto Group - *Software Developer Intern* Jun - Sep 2019

- Developed shuttle scheduling application to manage a fleet of 15 shuttles over 7 car dealerships
- Utilized Google Maps JavaScript API and SQL database to create a flexible and user-friendly interface

PROJECTS

Las3rs (https://las3rs.com) - *Lead Developer* May 2021 - Present (on/off)

- Developed a Web-based first person shooter in JavaScript, using NodeJS, ThreeJS and Socket.IO
- Implemented networking algorithms for lag-reduction and anti-cheat, minimizing network latency
- Wrote physics engine capable of managing motion of more than 300 objects, including collision detection
- Utilized profiling tools identify performance bottlenecks, achieving 60 FPS, responsive gameplay

Reinforcement Learning for Co-Operative Tactical Video Games January - May 2023

- Developed basic tactical shooter video game environment for training autonomous agents to cooperate
- Designed simple game engine and API supporting rapid training of neural networks in PyTorch

Cooperative Threading Library (https://github.com/ryancalizadeh/cooperative-threads) February 2023

- Wrote a co-operative C++ threading library capable of creating and managing limitless user threads concurrently
- Implemented multiple inter-thread communication options including signals, pipes, and condition variables

Machine Learning Coursework (https://github.com/ryancalizadeh/ECE-421-coursework) Sep - Dec 2022

- Built a Gated Recurrent Neural Network using a custom latent semantic embedding layer and custom gated recurrent unit, and trained it on the IMDB review dataset to detect sentiment in 300 word strings.
- Created and trained Convolutional Neural Networks for classification on CIFAR-100 and CIFAR-10 datasets using Objax
- Implemented the k-means clustering algorithm, support vector machines and principal component analysis from scratch

Graphics Rendering Engine (https://github.com/ryancalizadeh/graphics) May 2022

- Wrote C++ 3D graphics engine capable of rendering basic 3D shapes and parametric curves in 3D

The Curdler (https://drive.google.com/file/d/16zYiENwvgtFj-E8htOMfTmUB3qwlhI2r/view?usp=sharing) Feb - May 2022

- Designed and built robotic device powered by an Arduino Nano including custom sensors for detecting chemical changes in curdling milk and actuators to provide immediate feedback to users for UofT design course, earning a grade of A
- Implemented MQTT protocol over TCP in C++ for serial communication between device and an online dashboard

Neural Playground (https://github.com/ryancalizadeh/neural-playground) Dec 2021

- Developed 3 layer Neural Network for handwritten digit recognition in Python and NumPy from scratch
- Created accompanying suite of analysis and visualization tools for neural network

Content-Aware Scaling (https://github.com/ryancalizadeh/seam-carving) Feb 2021

- Created C program to process images by pixel energy and remove minimum-energy seams

AWARDS

RBC Arnold Chan Memorial Prize (https://doi.org/10.17975/sfj-2020-001) 2020

- Won award for innovatively visualizing salmon sighting data using Matplotlib, pandas, and NumPy in the Baffin Bay, demonstrating the effect of ocean warming on salmon spawning trends