Ryan Ngai

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Education

University of Toronto Toronto, ON
Bachelor of Applied Science in Computer Engineering *Expected May 2025*

Experience

407 ETR Concession Company Limited Vaughn, ON
Cloud Operations Engineer, Intern *May 2023 – Dec 2023*

- Implemented a Jenkins build pipeline to automate the processes of building, testing, and deploying applications, significantly enhancing workflow efficiency for multiple development teams by more than 100%.
- Integrated SonarQube with the Jenkins pipeline, resulting in a substantial enhancement of code security and quality in the development team's deployments.
- Conducted in-depth research on Terraform as a potential replacement for the existing AWS CDK infrastructure. Developed and presented a comprehensive report, including a proof of concept, to the DevOps team.

Agile Full Stack Engineer, Intern *Jan 2024 – Aug 2024*

- Implemented a database with a robust change history tracking feature using PostgreSQL and database triggers.
- Leveraged AWS Lambda functionality to run API endpoints that handles requests to the database securely.
- Utilized React.js to develop a fluid, responsive frontend, significantly improving ease of use for stakeholders transitioning from a pen-and-paper process.
- Contributed to the migration of over 50,000 entries from the legacy database to the new PostgreSQL system, conducting multiple rounds of testing and script adjustments to ensure data integrity and seamless adaptation to new formats.
- Led a team of three software engineers to develop a table auditing system using PostgreSQL triggers, AWS Lambda functions, and AWS Cognito, providing stakeholders with precise snapshots of table revisions.
- Facilitated weekly meetings with stakeholders to demonstrate newly implemented features and discuss future features to be implemented.
- Utilized unit tests and debugging using tools such as CloudWatch, which allowed me to write robust code.
- Participated in agile software development practices including daily standup, bi-weekly sprints, planning, and retros.

Projects

Car Identification Project | *Python*, *Pytorch 1.2*

- Developed a residual neural network using Python, Pytorch 1.2, and ResNet 101 to identify over 850 different car models with 82% accuracy.
- Implemented data augmentation on Stanford Car Dataset to increase training data which improved training accuracy by 12%.
- Created the ability to identify cars in a video using convolutional neural networks with 94% accuracy.

Hardware Processor | *Verilog*, *Assembly*, *C*

- Created a processor on the DE1-SOC FPGA board using Verilog that runs programs through instruction encoding.
- Implemented an interrupt request handler and FSM using a combination of Verilog and C that significantly increased performance of input by 80%.

Geographic Information System | *C++*, *EZGL*, *Libcurl*

- Developed a GIS application using C/C++ and the EZGL library (X11) to map 2GB of data sourced from OpenStreetMap.
- Implemented Dijkstra's algorithm and the 2-opt heuristic to tackle the NP-hard Traveling Salesman Problem, leading my team to secure second place in the competition.

Technical Skills

Languages: C++, C, Verilog, Assembly, Python, Javascript
Technologies: React.js, PyTorch, jQuery, Flask, Node.js, PostgreSQL, NoSQL, FPGA
Concepts: Compiler, Operating System, Processor Microarchitecture, Process Pipelining, Process Scheduling, Virtual Memory, Cache Memory, Artificial Intelligence, Machine Learning, Neural Networks, API, Agile Methodology, Cloud Computing