# Michael Bradley

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## EDUCATION

**Bachelor of Computer Science (Honours)** - Carleton University — Ottawa, ON | Sep 2020 - Dec 2024

Accepted with $3000/year scholarship. Achieved a major CGPA of 11.50/12 (A+).
Artificial Intelligence and Machine Learning stream.

## WORK EXPERIENCE

**Embedded Software Developer Student** - BlackBerry QNX — Kanata, ON | May 2024 - August 2024

- Created a generic C abstraction on data protected by mutexes to make multi-threaded code simpler and safer
- Simplified C++ class responsibilities and extracted functionality to allow camera feed sharing to multiple windows
- Tracked down memory leaks, race conditions, and deadlocks in interconnected multi-threaded C libraries with IPC
- Refactored code to comply with MISRA C 2012 standard, revealing threading bugs in the process
- Created several open source example applications to demonstrate the APIs of our Sensor Framework

**Software Developer** - Emids — Remote | May 2023 - August 2023

- Optimized React UI components until updates to the underlying data created no perceptible lag
- Created a filter component to dynamically update a list and calculate the appropriate zoom level to display a map
- Added features to the back-end of an active healthcare solution using an in-house functional language
- Reworked existing InQ Telehealth UI to accommodate new settings for clinicians to enhance clinic discoverability

**Test Automation & Software Developer** - Ross Video — Hybrid - Kanata, ON | May 2022 - April 2023

- Re-hired part-time after my co-op placement to research automated unit testing for an internal test framework
- Revamped an internal test automation codebase by single-handedly refactoring fifteen thousand of lines of Python to standardize the return types of the internal library functions, add type hints, and improve readability
- Created generic Jenkins CI/CD jobs to build and test products, enabling product teams to rapidly iterate features
- Automated OWASP ZAP and tenable.io security scans using an in-house test framework to access their Python APIs
- Wrote Bash scripts to add features to Jenkins jobs like Microsoft Teams messages indicating build status
- Rewrote an internal SharePoint site to improve readability and make it easier to search for specific documentation
- Updated processes for managing equipment in server racks to ensure consistent documentation and cleanliness

**Research Intern** - Carleton University — Remote | May 2021 - Aug 2021

- Awarded the Dean's Summer Research Internship to work with the Graphics, Imaging, and Games Lab
- Wrote a report on generating polycurves by circle-packing polylines as reference for upper year student projects
- Used knowledge of data structures to write efficient Java code to create circle-packings and analyze geometry

## SKILLS

C, C++ (OpenGL)

- Analyzed threading model of Sensor Framework at BlackBerry QNX to fix existing lock-ups and avoid future bugs
- Combined Phong lighting and real-time shadows to render Perlin noise on over 130M vertices at several FPS
- Wrote a top-down video game for a group project on my own after my group mates dropped the course, got an A+

TypeScript

- Integrated with Google Maps APIs to build a map component to filter and display a list of clinics
- Profiled and improved an un-optimized list component until updating the underlying data did not create lag
- Took initiative to reduce the use of the `any` type at Emids, improving developer experience and catching more bugs
- Created a pure JavaScript single-page site from scratch to securely deliver holiday messages to friends and family, including a unique generative design for each recipient and partial Markdown support

Python

- Refactored and type hinted a test automation library at Ross Video to fix bugs and improve developer efficiency
- Researched automatically generating unit tests to save developer time and improve stability
- Scraped and analyzed price data to determine how much money you would lose on video game lootboxes

POSIX (Linux, QNX)

- Set up a custom Arch Linux installation for my daily personal use over the last 2 years
- Maintained the system and researched solutions when my extensive customization broke it
- Worked with QNX APIs at BlackBerry to write efficient multi-threaded C code
- Managed a VPS to serve my personal website and handle any miscellaneous hosting I want to do
- Scripted with Bash to add functionality to Jenkins at Ross Video

Git

- Used GitLab to manage code and reviews at BlackBerry and exported commits into legacy SVN repos
- Used Azure DevOps to develope and collaborate on a monorepo at Emids
- Used Gerrit to conduct and receive code reviews on several Git repositories at Ross Video
- Managed personal projects and hosted custom websites on GitHub

## PERSONAL PROJECTS

**Real-time Shadow Simulator** — C++, OpenGL

- Built an OpenGL renderer in C++ that could cast real-time shadows on over 130M vertices
- Implemented a custom Perlin noise generator optimized to generate tiles in parallel
- Created lighting solution that scaled as needed so the renderer was limited only by VRAM
- Optimized matrix and vector operations with the GLM library

**N-Body M-Dimensional Gravitation Simulator** — Python, NumPy

- Implemented time-stepped gravity simulations over N bodies in 2 or 3 dimensions
- Set up functions such that an arbitrary number of dimensions could be used (visualization only for 2D/3D)
- Found initial conditions for a number of somewhat stable configurations of up to 8 bodies

**Electronic Holiday Card Distribution** — JavaScript, HTML, CSS

- Created a website from scratch (deployed using GitHub Pages) to distribute holiday cards to friends and family
- Used JavaScript APIs to encrypt the messages to ensure they were only read by the intended recipient
- Integrated the p5.js graphics library to generate unique assets and animated backgrounds
- Implemented a limited set of markdown functionality with regex replacement

**Video-Game Market Web Scraper** — Python, MatPlotLib

- Scraped and analyzed Steam Market data to determine the expected value of opening a lootbox in CS:GO
- Gathered analysis by scraping relevant websites, allowing analysis to be done over months of daily data
- Found meaningful ways to represent data to show profitability over time, proving it to be a bad investment

## ACCOMPLISHMENTS

**University** - Carleton University — Ottawa, ON | Sep 2020 - Dec 2024

Nominated for the Co-op of the Year award by Emids — December 2023
Deans' Honour List — Every year
Top 100 in Canada at solving multiple Rubik's Cubes blindfolded, top 1000 sighted with a time of 11.88s — Hobby

**High School** - Riverdale Collegiate Institute — Toronto, ON | Sep 2016 - Jun 2020

Math club president — Grade 12
High honour roll — Grade 12
Honour roll — Grade 9-11
First place in the OAPT Physics contest — Grade 11