Brian Tsoi

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Education

University of Toronto Expected Dec 2026
Bachelor of Applied Science in Computer Engineering GPA: 3.65/4.00
Relevant Coursework: Operating Systems, Algorithms & Data Structures, Computer Networks I, Distributed Systems, Introduction to Artificial Intelligence, Applied Fundamentals of Deep Learning

Experience

NVIDIA
May 2025 – Aug 2025
System Software Engineer Intern - Autonomous Vehicle Platform (DriveOS) *Santa Clara, CA*

- Engineered a multi-threaded **C++** stress testing framework to validate NvStreams data pipeline, emulating behavior of **30+** high-throughput data streams across **90+ parallel processes**
- Resolved **critical stability regression** in the QNX automotive RTOS by leveraging custom stress test
- Reduced a **4-hour** manual performance data collection cycle to **20 minutes** using **Python** and **Bash**
- Instrumented NvStreams SDK code, identifying context switches and IPC as performance bottlenecks (**68%** of latency), guiding future optimization roadmap

Mozilla Corporation
Sep 2024 – Apr 2025
Backend Software Engineer Intern - OS Integration for Firefox *Toronto, Canada*

- Authored and open-sourced `memtest`, a **low-level Rust** library with **15+ memory testing algorithms**, achieving **over 4,800 downloads** in its first 3 months on crates.io
- Invalidated **1.16% main process crashes**, preventing wasted engineering hours on non-reproducible failures, by integrating `memtest` into Firefox's crash reporter to identify faulty hardware
- Analyzed **over 108k** crash reports with **Python** and **SQL** for memory testing effectiveness evaluation

Mozilla Corporation
May 2024 – Aug 2024
Backend Software Engineer Intern - OS Integration for Firefox *Toronto, Canada*

- Reduced volume of targeted crash types by **5%** in a **2.3M+/month** crash pipeline, by implementing **x86-64 ASM semantic validation** in **Rust-minidump** analyzer to identify invalid reports
- Automated early testing on over **25k reports** with **Python** to ensure validation feature reliability
- Worked across **3 time zones** with a globally distributed team to ensure high-quality deliverables

Projects & Extracurriculars

ESP32 Microcontroller-based Arcade Machine Sep 2024 – Apr 2025

- Spearheaded a **team of 10** as **Project Lead** in end-to-end **C++** and **FreeRTOS** development of a dual-**ESP32** game system, integrating **11 I/O peripherals** and **96 LEDs** on a 32"x28"x68" machine
- Organized workshops for **15+ design team members** on use of **Git** to streamline teamwork process

AI Ray Tracing Image Denoising Filter May 2023 – Aug 2023

- Trained a **Pytorch** autoencoder neural network for denoising low-sampling rate ray tracing images
- Optimizied to reach **83% image quality improvement** and outperform conventional filters by **47%**

Google Maps Clone Jan 2023 – Apr 2023

- Rendered OpenStreetMap data at **60 fps** with **GTK** by writing efficient **C++** graphics algorithms
- Reduced path routing time to under **23ms** by utilizing **A* path finding** algorithm

Skills

Programming: C, C++, Python, Rust, Java, Go, x86-64 Assembly, HTML, CSS, JavaScript, SQL, Git
Embedded/Hardware: STM32 microcontrollers, RTOS, Arduino, Raspberry Pi, UART, I2C, SPI