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 - NvStreams on DriveOS *Santa Clara, CA*

- Engineered a high-concurrency multi-threaded **C++** stress testing application for the NvStreams SDK, ensuring data pipeline integrity across **90+ parallel processes** and **30+ data streams**
- Resolved **critical stability regression** in QNX by leveraging custom stress test for diagnosis
- 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
May 2024 – Apr 2025
Backend Software Engineer Intern - Operating Systems Integration Team *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
- Integrated `memtest` into Firefox's crash reporter to identify faulty hardware, successfully invalidating **1.16% main process crashes** and preventing wasted engineering hours on non-reproducible failures
- Implemented **x86-64 assembly semantic validation** in **Rust-minidump** analyzer (used by Mozilla, Microsoft, Sentry), improving signal-to-noise ratio of a crash pipeline with **2.3M+** reports monthly
- Analyzed **over 108k** crash reports with **Python** and **SQL** for test effectiveness evaluation

UofT Spark Design Team
Sep 2022 – Apr 2025
Student Software Project Lead *Toronto, Canada*

- Spearheaded a **team of 10** 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" arcade project
- Organized workshops for **15+ members** on use of **Git** and **linters** to streamline teamwork process

Projects

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