Brian Tsoi

Toronto, ON, Canada | +1 437 991 5356 | brian.s.tsoi@gmail.com | **LinkedIn:** linkedin.com/in/brian-tsoi-4835ab262/

Education

University of Toronto *Sep 2021 - Present*
Bachelor of Applied Science in Computer Engineering (Third Year) Expected Graduation, May 2025
Cumulative GPA: 3.64/4.00

Skills

Programming: C, C++, Python, HTML, CSS and Javascript, ARM Assembly
Hardware/Embedded: Arduino, STM32 microcontrollers, UART, I2C, SPI, Real-time operating systems, FPGAs (verilog),
Tools and Platforms: Linux dev tools (gcc, make, gdb, valgrind), basic linux commands, Git, Github
Languages: Chinese (native in Cantonese, fluent in Mandarin), English (fluent)

Experience

Firmware Developer *Sep 2022 - Present*
University of Toronto Aerospace Team (Space Systems Division)

- Developed an adaptive Python compression algorithm (based on Golomb-Rice coding), achieving 1.5:1 compression ratio for hyperspectral image data captured by UTAT Cube Satellite set to launch in 2025
- Prototyped **finite state machines** (FSM) for STM32 microcontrollers on the satellite using **FreeRTOS**
- Leveraged the **STM32** Hardware Abstraction Layer to interface with a GPS module, enabling NMEA message reception through UART and SPI with an STM32 microcontroller
- Researched RTOS dynamic thread creations, allowing tasks to be created during main super loop with variable priorities
- **Collaborated** with other satellite sub-teams (electrical, payload) in component drivers and FSM development

Hardware and Software Developer *Sep 2022 - Present*
University of Toronto Spark Design Team

- Designed an interactive LED pattern recognition display alongside with 3 other sub-team members
- Programmed minigame using **Arduino Uno** and **C++** to synchronously control **peripheral devices** for user I/O
- **Assembled** circuits and **soldered** electrical components for game prototype in order to debug game program

Projects

Terminal Text Editor *Sep 2022 - Present*

- Constructed a terminal text editor utilizing **the C standard library**, **POSIX API** and **VT100** terminal sequences
- Implementing Vim-like keyboard bindings and **modal editing** functionality using C programming constructs (structs, bitwise operation, **pointers** and **dynamic memory allocation**)

Map Application *Jan 2023 – Apr 2023*

- Created a data parsing API that reads OpenStreetMap data using **C++** and the **STL library**
- Employed different **data structures** in the STL library to facilitate efficient data retrieval
- Crafted a map GUI using the **GTK** library, enabling users to drag, zoom and search for map locations
- Utilized **A* path finding** algorithm to provide users with travelling directions

Smart Glasses *Feb 2023*
MakeUofT Hardware Hackathon

- Proposed and **prototyped a smart glasses design** that encourages optimal reading conditions
- Integrated photoresistors, ultrasonic sensors and active buzzer into a circuit controlled by **Arduino Uno**
- Crafted a web application user interface using **HTML, CSS, Javascript**

Minigames (Pong and Conway's Game of Life) *Jun 2021 – Nov 2021*

- Reimplemented the Pong game with AI computer opponents using the **Python Pygame** library
- Created an interactive webpage demonstrating Conway's Game of Life using **HTML, CSS, Javascript**

Awards

- Dean's Honours List (Fall 2021, Spring 2022, Fall 2022)
- First place in University of Toronto Engineering Kompetition (UTEK), Communication category, qualified for Ontario Engineering Competition