Luke Tao

luketao.ca
jy3tao@uwaterloo.ca
https://github.com/tao-luke

Skills

Languages
- C, C++, Python, PHP, SQL

Tools and Frameworks
- GDB, Bazel, CMake, Valgrind, OpenSSL, MbedTLS, LTTng, Matlab, MySQL, CMock, Unity

Work Experience

Sibros, Firmware Engineer Intern 09/2022 – 12/2022
- Built RTOS logging features with 100% branch and line unit-test coverage using **C**, **Unity**, and **Bazel**
- Designed and implemented a heuristic-based **MQTT** packet transmission protocol, increasing MTU utilization by at least **204%** when averaged over 10,000 independent executions
- Extended core product to support CAN multiplexer signal logging, allowing OEMs to flexibly and confidently trace complex **CAN DBC** data remotely

Huawei Canada, Software Engineer Intern 09/2021 – 12/2021
- Engineered **NIST** cryptographical features, such as ciphers/hashes, on to credit card RFIDs using **MbedTLS** and **OpenSSL**
- Took leading initiatives to examine, resolve, and document delivery-critical vulnerabilities using **GDB** and **Valgrind**, recovering production stability by **14%** (1 out of 7 projects)

Kaleidescape, Systems Engineer Intern 04/2021 – 09/2021
- Assembled a user-facing, efficient movie search system in **C++11** that is concurrent actionable and provides secure, cache-optimized content navigation on a modern cinema playback system

Research

High-Performance User-level Threading, Undergraduate Research Assistant 04/2022 – 09/2022
- Integrated **LTTng** to non-intrusively(<=2% CPU cycles) trace synchronization primitives and user threads in massively-concurrent systems, allowing direct comparison against theoretical bounds

Projects

Waterloo Rocketry, Intercollegiate Rocket Engineering Competition 04/2022 – Present
- Embedded various sensor peripherals and related **CAN**-bus message sanitizing protocols onto PIC micro-controllers using **C** and assembly

FlexiPress 03/2021 – 04/2021
- Prototyped an algorithm-flexible compression program in **C++**, with a custom file format, to support a combination of modern deflation algorithms
- Constructed to permit fully data-tailored encoding operations, improving certain compression ratios by up to 3% in comparison to **BZIP**

Education

Honours Bachelor of Computer Science, **University of Waterloo** 09/2019 - 04/2024
- **Relevant Courses**: Computer Security and Privacy, Computer Networks, Operating Systems, Data-Structures, Algorithms
- **Awards**: Duke of Edinburgh's Award Gold, President's Research Award, President's Scholarship of Distinction