Luke Tao

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https://github.com/tao-luke

Skills

Languages
- C, C++, Rust, Python, SQL

Tools and Frameworks
- GDB, Bazel, Scons, CMake, Valgrind, Matlab, CMock, Unity

Work Experience

Tesla, Vehicle Simulation Software Engineering Intern — Palo Alto, California | 1/2023 – 04/2023
- Implemented continuous, behavior-based assertions to support model validation in over **50** safety-critical, vehicle firmware components
- Integrated simulation backend to support open data transformation using **Rust**, **Polars**, and **Pyo3**, permitting flexible signal processing that interfaced both **Rust** and **Python** in **RTOS** validation

Sibros, Firmware Engineer Intern — San Jose, California | 09/2022 – 12/2022
- Designed and implemented a heuristic-based **MQTT** packet transmission protocol, improving 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 — Toronto, Ontario | 09/2021 – 12/2021
- Developed **NIST** cryptographical features, such as ciphers/hashes, onto credit card RFIDs using **C** and **MbedTLS** with >= 10% memory reduction compared to standard distribution

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 to support rocket load delivery

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