

# Luke Tao

🌩 luketao.ca

📧 jy3tao@uwaterloo.ca

🐙 <https://github.com/tao-luke>

## Skills

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### Languages

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

### Tools and Frameworks

- GDB, Bazel, Scons, CMake, Valgrind, Matlab, CMock, Unity

## Work Experience

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**Tesla**, Autopilot Core Software Engineering Intern Palo Alto, California | 01/2024 – Present

- Develop and debug SoCs and Linux kernel to enable self-driving vehicles

**Tesla**, Vehicle Simulation Software Engineering Intern Palo Alto, California | 01/2023 – 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, using **C++**, 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

## Research

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**High-Performance User-level Threading** 🐉, Undergraduate Research Assistant 04/2022 – 09/2022

- Integrated **LTTng** to non-intrusively ( $\leq 2\%$  CPU cycles) trace synchronization primitives and user threads in massively-concurrent systems, allowing direct comparison against theoretical bounds

## Projects

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**TheOS** 09/2023 – 12/2023

- Built a **RTOS** and its micro-kernel in **C** and **ARM assembly** to support context-switching, scheduling, and interrupts to manage a train system using a Raspberry Pi

**Waterloo Rocketry**, Intercollegiate Rocket Engineering Competition 04/2022 – 12/2022

- Embedded various sensor peripherals onto PIC micro-controllers using **C** to support rocket load delivery
- Actively triaged tickets and managed technical priority to meet competition deadline

## Education

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**Honours Bachelor of Computer Science, University of Waterloo** 09/2019 - 04/2024

- **Relevant Courses:** Real-Time Operating Systems, 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