Roberto Valenzuela

Embedded Software Engineer
revalenz@uwaterloo.ca | +1 (226) 898-9776 | GitHub: roemvaar | LinkedIn: roberto-valenzuela

---

Skills

- **Languages:** C, C++, Python, Bash, Assembly (ARM, RISC-V), HDL (Verilog), Rust
- **Embedded Software:** Bare-metal, RTOS, Embedded Linux
- **Tools:** Git, CMake, Yocto Project, U-Boot, Linux kernel, device drivers, FreeRTOS, GDB
- **Open Source:** OSo, Linux Kernel, meta-freertos

Professional Experience

Molex Waterloo, ON
Embedded Software Engineer Intern Jan 2023 - May 2023

- Developed a configuration tool using **Python** to standardize the creation of new embedded projects.
- Designed a **hypervisor-based** solution for several projects and products.

Continental Guadalajara, Mexico
Embedded Software Engineer Jul 2021 - Apr 2022

- Developed software for an automotive antenna module. Used **C++** to create the middleware using POCO C++ Libraries on an ARM-based Linux system.
- Implemented code that provides **Wi-Fi** and **SMS** connectivity to the vehicle and passengers.

John Deere Monterrey, Mexico
Embedded Software Engineer Jun 2019 - Jul 2021

- **Board bring-up** of a new generation display controller.
- Developed firmware for the display controller that runs **FreeRTOS** on an FPGA-based microcontroller using **C**.
- Some features that I implemented are the **triple buffering algorithm** that controls the DMA cores in charge of displaying images on the screen and the configuration and initialization of multiple drivers, such as audio, DisplayPort, and memory drivers.
- Designed and developed a **Linux device driver** for a radar frequency input that calculates the real speed of the vehicles.
- Modified touchscreen driver and the **device tree** to enable communication between the touchscreen controller at the display with a Linux system.
- Developed firmware for electrical validation of a 300-kVA power inverter with a 32-bit AURIX TriCore Infineon Microcontroller using **C** running FreeRTOS and tested the implementation using a HIL setup with Python.

fileee GmbH Munster, Germany
Software Engineer Intern May 2018 - Aug 2018

- Developed front-end software for a web application using **JavaScript** (React).

Education

University of Waterloo Waterloo, ON
MEng in Electrical and Computer Engineering May 2022 - Present

- Designed a plug-in software architecture for the acquisition and analysis of side-channel power traces to detect undocumented commands and backdoors on black-box targets.
- Performed side-channel analysis of MAVLink protocol using a drone as a target to detect vulnerabilities in the communication protocol between the drone and ground station.
- Developed a cybersecurity testbench to perform side-channel analysis on automotive ECUs.

Instituto Tecnológico de Sonora Ciudad Obregon, Mexico
BSc in Electronics Engineering Aug 2014 - May 2019