

# OWEN BRAKE

Waterloo Mechatronics Engineering · [OwenBrake.com](http://OwenBrake.com) · (650)307-1782 · [me@OwenBrake.com](mailto:me@OwenBrake.com)

## SKILLS

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- End-to-End Systems Design
- HV (High-Voltage) Systems
- Resource-Constrained, Real-Time Systems
- Embedded HW and FW
- Li-ion & LiFePO<sub>4</sub> Battery Modelling
- Robotics
- Mechanical Design and Integration
- Inverter / Motor Control
- Wireless Charging

## WORK EXPERIENCE

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### Neuralink

*Firmware and Hardware for Implant Systems*

**Summer 2023**

Fremont, CA

- Designed safety critical, real time firmware for Neuralink implant and charger system.
- Designed and performed critical RF testing and qualification for communication and charging systems
- Developed on validation system and caught critical architecture, compiler and functional defects

### Parallel Systems

*Hardware Engineer*

**Summer 2022, Winter 2023**

Los Angeles, CA

- Designed HV PCBs in Altium and brought up RTOS firmware for said boards
- Worked extensively on bringing up isoSPI communication and working with LTC68XX chips
- Debugged critical HF and VHF communication systems including Gigabit Ethernet systems
- Developed HITL test boards for validating production system boards

### Tesla

*Firmware - Drive Inverter Systems*

**Fall 2021**

Palo Alto, CA

- Developed highly-performant, resource constrained firmware for the Drive Inverter boards
- Developed and deployed mission-critical features for millions of production vehicles
- Developed firmware across multiple chip architectures to accommodate for 2020/2021 Semiconductor Shortage

### Apple

*Embedded Firmware Engineer*

**Winter 2021**

Remote

- Specific features are currently redacted to preserve confidentiality

### Ford Motor Company

*Software Engineer*

**Summer 2020**

Remote

- Worked on system to process vehicle core dump files into easily readable, accessible and shareable online formats using GDB and Java
- Rewrote permissions system to enable complex and nested conditions while maintaining performance on system with over 1 billion database records in Java and SQL

### Groupdesk

*Full Stack Developer*

**Summer 2019**

Toronto, ON

- Developed CRUD services, using Angular to remove user dependence on technicians

## PROJECTS AND TEAMS

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### Waterloo Formula Electric Team (Technical Lead)

**September 2019 - Present**

- Designed multi-stage precharge system for HV Battery to compensate for parasitic loads on HV bus
- Implemented Vehicle Dynamics Algorithms like: Traction Control, Torque Vectoring, Endurance Mode for vehicle
- Developed accurate state of charge algorithm using Coulomb Counting and Voltage Maps
- Designed and implemented firmware for ARM Cortex-M7 and M0 boards in FreeRTOS and C which communicate on the CAN bus
- Developed sensor analytics platform on Python for Beaglebone to measure and visualize live vehicle performance remotely
- Worked on drivers for the various sensors and external boards on the car like: LTC6812, ADE7913, LTC4110, etc.