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SUMMARY

Computer Engineering student pursuing firmware engineering opportunities with hands on experience building MCU based embedded systems in C. Academic projects and research cover **bare metal** programming, FreeRTOS, Zephyr, **peripheral drivers**, sensor integration, secure boot concepts, firmware updates, and hardware interfaces including SPI, I2C, UART, CAN, and ADC. Practical work includes **Segger J Link**, GCC, BLE, GPS, power aware sensing, automated tests, structured telemetry, and **hardware bring up**. Debugging efforts used timing traces, current measurements, serial logs, logic analyzer observations, and documented initialization checkpoints. Collaborative project work connected firmware interfaces with gateway software and test contributors. Coursework and design reviews strengthened communication, code quality, iterative validation, and awareness of distributed sensor systems. This preparation supports thoughtful contributions across embedded product development, from MCU initialization and driver work through reliable testing and deployment.

EDUCATION

Bachelor's Degree in Computer Engineering

2027

University of California, Davis GPA: 0

Davis, CA

***Coursework:** Embedded systems, computer architecture, C programming, distributed sensor systems*

TECHNICAL SKILLS

- **Programming Languages:** C, C programming, Embedded C
- **RTOS Platforms:** FreeRTOS, Zephyr, RTOS
- **Debugging Tools:** Segger J Link, GCC, Logic analyzer
- **Serial Interfaces:** SPI, I2C, UART
- **Vehicle Interfaces:** CAN, CAN bus, Framed messages
- **Analog Systems:** ADC, Analog sensing, Current measurement
- **Wireless Connectivity:** BLE, GPS, LTE
- **Firmware Architecture:** Bare metal, Peripheral drivers, State machines
- **Device Security:** Secure bootloaders, Integrity checks, Recovery flows
- **Testing Practices:** Automated testing, Unit testing, Hardware in the loop
- **Embedded Operations:** Power management, Sensor integration, Telemetry
- **Development Workflow:** Git, Version control, Code quality

SKILLS

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|--------------------|------------|--------|---------------------|
| • C programming | • FreeRTOS | • CAN | • ADC |
| • Embedded systems | • Zephyr | • SPI | • Automated testing |
| • MCU development | • BLE | • I2C | • Debugging |
| • Bare metal | • GPS | • UART | |

EXPERIENCE

Firmware Engineering Capstone Developer

January 2026 - Present

Capstone Project

Davis, CA

Develops C firmware for a battery powered environmental sensor prototype within a two semester capstone. Owns MCU bring up, peripheral drivers, FreeRTOS task design, connectivity, telemetry, testing, and technical reviews.

- Developed C firmware for battery powered sensing, event buffering, and gateway telemetry across capstone iterations.
- Brought up **MCU** hardware with **Segger J Link** and GCC, validating GPIO, ADC, SPI, I2C, and UART.
- Implemented **FreeRTOS** tasks for sensing, events, communications, and power states using timing traces and current measurements.
- Created peripheral abstractions and firmware update flow with integrity checks for documented boot and recovery behavior.
- Integrated **BLE** and **GPS** modules, defining compact messages for gateway inspection of events and session logs.
- Built automated host and hardware in the loop checks for parsing and state transitions during reviews.

Embedded Systems Research Assistant

September 2025 - December 2025

University Research Lab

Davis, CA

Supported supervised wireless sensing research with MCU boards, C firmware, and **Zephyr**. Contributed sensor configuration, BLE exchange, power studies, test checks, defect reproduction, and research documentation for faculty review.

- Configured **SPI** and I2C sensors with **UART** logging and J Link debugging, isolating initialization faults for repeatable bring up.
- Implemented BLE exchange for experimental nodes, structuring timestamped observations across controlled device runs.
- Added power state instrumentation and reviewed current measurements across sampling intervals for operating mode selection.
- Wrote unit checks for data conversion and packet handling, reproducing defects from documented test notes.
- Submitted reviewed firmware fixes through version control, preserving clear changes for other student researchers.
- Prepared architecture and test documentation for faculty and student review of research methods and limitations.

Embedded Firmware Course Project Developer
Student Lab

January 2025 - June 2025
Davis, CA

Built supervised **bare metal** C firmware for an MCU vehicle bus project. Delivered peripheral configuration, **CAN** messaging, state control, debugging, driver separation, and documented validation for classroom demonstration.

- Built bare metal C firmware for analog sensing and framed CAN messages in a supervised vehicle bus laboratory.
- Configured **ADC**, GPIO, timers, UART, and CAN with **GCC** builds and debugger breakpoints for startup validation.
- Designed a state machine for sensor acquisition and fault reporting, testing normal and error inputs with scripts.
- Developed driver routines for peripheral initialization and message handling, separating hardware code from application logic.
- Used serial logs and logic analyzer observations to diagnose timing and framing errors during lab validation.
- Demonstrated firmware tradeoffs, test coverage, and gateway extension concepts to classmates and instructors.

PROJECTS

Battery Sensor Telemetry Prototype 📅 2026

Built a battery powered environmental sensor prototype with C, FreeRTOS, BLE, GPS, structured events, and gateway telemetry. Current measurements guided power state decisions.

Wireless Sensing Research Node 📅 2025

Studied MCU based wireless sensing with Zephyr, SPI, I2C, UART, BLE, timestamped observations, and unit checks across controlled laboratory runs.

LEADERSHIP & AWARDS

- Undergraduate Design Showcase Finalist, 2026
- Dean's List, College of Engineering, 2025
- Engineering Academic Achievement Scholarship, 2025

CERTIFICATIONS

- Introduction to Embedded Systems Software and Development Environments 📅 2025
- Microsoft Learn Introduction to C Programming Concepts 📅 2024

PROFESSIONAL AFFILIATIONS

- Embedded Systems Peer Study Group, Session Coordinator, 2025 to Present
- Engineering Design Club, Project Member, 2024 to Present
- College of Engineering Peer Mentor, 2026 to Present

LANGUAGES

- English (Native)
- Spanish (Intermediate)

ADDITIONAL INFORMATION

Work Status : Authorized to work in United States. No sponsorship required.

REFERENCES

AVAILABLE ON REQUEST