Branwen Castellanos

Embedded Software Engineer

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SUMMARY

Embedded software engineer with 5 years writing C and C++ firmware for ARM Cortex-M microcontrollers, working across FreeRTOS, SPI, I2C and CAN bus. Cut a sensor board's power draw by 35% through driver-level sleep mode work and led the debug of an intermittent CAN fault that had blocked a product launch for 6 weeks. Comfortable owning firmware from bring-up through field support.

EXPERIENCE

Embedded Software Engineer — Pecanwood Sensing Systems

Austin, TX · Mar 2022 – Present

- Rewrote the power management driver for an STM32-based sensor board, moving the MCU into deep sleep between readings and cutting average power draw by 35%.
- Diagnosed an intermittent CAN bus fault that had blocked a product launch for 6 weeks, tracing it to a termination resistor mismatch using a logic analyzer and oscilloscope.
- Wrote the FreeRTOS task scheduling for a 4-sensor fusion board, meeting a 2ms control loop deadline with 15% CPU headroom to spare.
- Built the bootloader and over-the-air update path for 3,000 deployed field units, reducing failed updates from 4% to under 0.3%.

Firmware Engineer — Lonestar Home Devices

Austin, TX · Jun 2019 – Feb 2022

- Wrote I2C and SPI drivers for 5 sensor peripherals on a smart thermostat, bringing up each new sensor in under a week from datasheet to working driver.
- Reduced flash usage by 18% through code size optimization, making room for a new firmware feature without a hardware revision.
- Set up a hardware-in-the-loop test rig that caught 12 regressions before release across 2 product lines.

SKILLS

Languages: C, C++, Python (test tooling), ARM assembly (basic)

Platforms: ARM Cortex-M, FreeRTOS, bare-metal, STM32, Nordic nRF52

Protocols: SPI, I2C, UART, CAN, Bluetooth Low Energy

Tools: JTAG/SWD debugging, oscilloscope, logic analyzer, GCC toolchain, Git

EDUCATION

B.S. Electrical Engineering, University of Texas at Austin, 2019

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