Brent A. Thorne

Embedded Systems & Software Engineer
C/C++ • Firmware • Precision Measurement • Real-Time Systems • CI/CD Automation
San Francisco, CA
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Portfolio: fractalclockwork.github.io **GitHub:** github.com/fractalclockwork

Professional Summary

Embedded software engineer with 15+ years of experience developing **C/C++ firmware, real-time systems, and precision sensing pipelines** across embedded Linux and custom hardware platforms. Skilled in **driver development, signal processing, system-level debugging, and hardware–software integration**. Experienced building **CI/CD automation** for embedded targets using Docker, GitHub Actions, and Jenkins-compatible workflows. Recently completed an M.S. at UC Berkeley focused on **scientific computing, high-performance systems, and advanced modeling**. Adept at collaborating with cross-disciplinary engineering teams to deliver robust, production-grade systems.

Core Skills

- **Languages:** C, C++, Python, Bash
- **Embedded Systems:** Linux, RTOS, device drivers, board bring-up
- **Firmware:** I2C, SPI, UART, CAN, timing/synchronization
- **Build Systems:** Make, CMake, cross-compilation
- **Version Control:** Git, branching workflows
- **CI/CD:** Jenkins, GitHub Actions, Docker, Labgrid, automated testing
- **Signal Processing:** sensor fusion, precision measurement, filtering
- **Video/Sensors:** OpenCV, V4L2, FFmpeg, GStreamer
- **Debugging:** system-level profiling, hardware integration, performance tuning
- **Scientific Computing:** numerical methods, modeling, HPC

Professional Experience

Research Engineer — Embedded Systems & Scientific Computing (2018–Present)
Freelance Consultant, San Francisco, CA

- Developed **embedded C/C++ firmware drivers** for sensor and imaging systems, including timing-critical I/O and custom protocol stacks.
- Built **real-time Linux pipelines** for synchronized video, sensor acquisition, and precision measurement using OpenCV, V4L2, and FFmpeg.
- Designed and maintained **CI/CD automation** for embedded Linux targets using Docker and GitHub Actions (Jenkins-compatible workflows).

- Performed **system-level debugging** across hardware, drivers, and application layers to resolve timing, performance, and integration issues.
- Created reproducible build environments, cross-compilation toolchains, and automated artifact packaging for long-lived codebases.
- Collaborated with hardware engineers to integrate analog/digital subsystems and negotiate design trade-offs.

Senior HW/SW R&D Engineer (2013–2018)
GridNet, San Francisco, CA

- Designed and implemented **embedded radio modem firmware** in C/C++ for signal-intensive wireless systems.
- Developed device drivers and communication stacks for custom embedded platforms.
- Conducted performance tuning and system-level debugging across RF, firmware, and embedded Linux layers.

Design Engineer — Embedded Systems Consultant (2011–2013)
Freelance Consultant, San Francisco, CA

- Built embedded medical/wearable systems integrating precision bioelectrical sensing and real-time signal processing.
- Designed hardware prototypes using CAD, CNC machining, and custom PCB development.

Software Engineer — Systems Specialist (2004–2011)
OpenTV, San Francisco, CA & Amsterdam, NL

- Developed embedded protocol software for broadband media platforms.
- Integrated real-time signal processing pipelines and optimized network performance.

Education

M.S. in Molecular Science and Software Engineering 2026
University of California, Berkeley
Scientific computing, embedded systems, modeling, HPC

Certificate in Applied Data Science
Massachusetts Institute of Technology

B.S. in Electronics Engineering Technology
Hamilton Technical College

Patents

System for Optimal Physical Exercise and Training – US 61834836 (Filed Jun 13, 2013)
Developed a system for processing, displaying, and comparing bioelectrical signals.