

Tyler Hamilton

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EDUCATION | California Polytechnic State University, San Luis Obispo

Bachelor of Science in Computer Engineering

Expected Graduation June 2026

- Cumulative GPA: 3.85 | Dean's List (9x), President's List (2x)

Relevant Coursework: Real-Time Embedded Systems; Microcontrollers and Embedded Applications; Computer Hardware and Architecture Design; Introduction to Computer Networks; Digital Signals and Systems; Circuits I-III

Security Clearance: Secret Security Clearance (2023-present)

EXPERIENCE

Aspires Innovation Co.

Fall 2025 - Present

Embedded Firmware Test Engineer Intern

San Luis Obispo, CA

- Validate embedded devices through structured testing, implement firmware updates based on performance data, and document findings for engineering reviews
- Devise and execute test procedures to evaluate hardware-firmware interactions, identifying issues and contributing fixes to improve system performance
- Collaborate with cross-functional teams to enhance system reliability and performance

Booz Allen Hamilton

Summer 2025

Hardware and Firmware Engineering Intern

San Diego, CA

- Built a real-time, interrupt-driven grip force sensing system on an ESP32 MCU, using ADCs to capture multi-channel analog data at 50 Hz, and achieved low-latency monitoring using socket programming
- Designed a dual-camera eye-tracking prototype on a Raspberry Pi, integrating IR-sensitive global shutter camera modules and adapting open source software with OpenCV for real-time pupil/gaze tracking
- Presented prototype work to C-suite executives and earned Top 5 placement in the firmwide intern competition

Naval Information Warfare Center (NIWC) Pacific

Summer 2024

Naval Research Enterprise Internship Program (NREIP) — Engineering Intern

San Diego, CA

- Developed and implemented Long Range (LoRa) modulation for underwater communication systems
 - Designed and generated customized LoRa signal variations in GNU Radio, encoding multiple message types to test reliability and performance in underwater communication
 - Enabled wireless communication by outputting signals from an STM32 MCU using a DAC
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PROJECTS

Real-Time Multithreaded Video Processing on Raspberry Pi 5 (C++)

Fall 2025

- Implemented custom Grayscale and Sobel edge-detection algorithms for real-time image processing on a Raspberry Pi 5, tailoring memory access patterns for embedded hardware constraints
- Engineered a parallel processing pipeline using pthreads and ARM NEON SIMD intrinsics, achieving efficient per-core workload distribution to accelerate pixel-level computation
- Optimized system performance using perf and Cachegrind, identifying bottlenecks and implementing stripe-based tiling and direct-write output paths, resulting in a 2.6x increase (15.9 → 41 FPS)

Sudoku Game System on STM32 (C)

Spring 2025

- Developed a terminal-based Sudoku game supporting difficulty selection via UART, keypad input, and real-time grid updates using timer interrupts and progress tracking
- Integrated LCD, I2C-driven LEDs, and a GPIO keypad matrix for interactive feedback and user navigation
- Modularized firmware into drivers and game logic for maintainability and hardware abstraction

RISC-V Pipelined CPU (SystemVerilog)

Spring 2025

- Designed and implemented a 5-stage pipelined CPU, incorporating branch prediction, hazard detection, and resolution logic to maximize instruction throughput
 - Developed a 16×32B direct-mapped instruction cache to reduce latency and improve fetch efficiency
 - Engineered a 4-way set-associative data cache with finite state machine (FSM)-based refill control and least recently used (LRU)-based block replacement strategy for optimized memory performance
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SKILLS

Programming Languages: Python, C++, C, RISC-V Assembly, SystemVerilog, MATLAB

Embedded and Hardware: STM32, ESP32, UART, I²C, SPI, GPIO, ADC, DAC, PWM

Tools and Platforms: Unix (Vim), Linux (Ubuntu), Git, GitHub, LTspice, GNU Radio, MQTT, OpenCV, GDB