

Gavin Ruane

(650) 291-1161 | me@gavinruane.me | linkedin.com/in/gavinruane | github.com/gavinjrune

EDUCATION

California Polytechnic State University

Bachelor of Science in Computer Engineering, 3.6 GPA (Cum Laude)

San Luis Obispo, CA

Sep. 2022 – June 2026

EXPERIENCE

Capstone Project Intern

Wolfpack Gear, Inc.

Sep. 2025 – June 2026

San Luis Obispo, CA

- Refurbished a non-functioning, completely undocumented CNC fabric cutter by integrating LinuxCNC, a Raspberry Pi 5, and a Mesa 7i96 motion controller.
- Designed a full-stack Flask-based web app for machine control and monitoring statistics that integrated with a SQLite database for storing user credentials and machine parameters.
- Produced extensive product and maintenance documentation while communicating progress and requirements with a non-technical client.

Lead Instructional Student Assistant

Computer Science / Software Engineering Department at Cal Poly

Sep. 2025 – June 2026

San Luis Obispo, CA

- Organized and taught lab activity sessions focused on reinforcing operating systems concepts including scheduling, concurrency, and memory management.
- Designed and programmed a Python-based grading utility to automate compiling and evaluating 70 student projects for each assignment.

Undergraduate Research Assistant

Computer Science / Software Engineering Department at Cal Poly

Feb. 2026 – June 2026

San Luis Obispo, CA

- Analyzed survey results and historical data to research the impact of peer-led team learning on student success in computer science courses
- Presented preliminary research results at the 2026 ISTES conference in New York and communicated with conference attendees about their feedback.

PROJECTS

x86-64 Kernel | *C, Make, GDB, GCC, x86 Assembly*

March 2025 – June 2025

- Developed an x86-64 kernel using the Multiboot2 and GRUB standards in long mode.
- Implemented VGA graphics, an interrupt-based serial driver, and an interrupt-based PS/2 driver for displaying debug information and interactive kernel input.
- Implemented a dynamic kernel memory allocator (`malloc()`) with page management and “bucket” allocation.

Remote-Controlled Car | *FreeRTOS, ESP32, C, Bluetooth Classic, ESP-IDF*

April 2026 – June 2026

- Designed and implemented a Bluetooth abstraction library using FreeRTOS tasks, queues, and notifications to separate car logic from Bluetooth control.
- Integrated an ultrasonic sensor for automated object detection and avoidance.
- Structured firmware as a collection of FreeRTOS tasks interacting through concurrency primitives and IPC structures to simplify concurrency and isolate resources.

User-Level Thread Library | *C, x86*

Jan. 2025 – Feb. 2025

- Implemented a user-space thread library by allocating thread stacks and context switching in x86 assembly.
- Exploited stack structure and System V calling conventions to enable context switches.
- Designed a cooperative round-robin scheduler permitting explicit yielding between threads.

Interpreted Language | *Racket*

April 2026 – June 2026

- Created a parser and interpreter for a Lisp-like language in Racket.
- Implemented fundamental functional paradigm features including closures, anonymous functions, and recursion.
- Integrated a static type checker to validate types before interpretation.

TECHNICAL SKILLS

Languages: C, Python, Go, Rust, TypeScript, JavaScript, Kotlin, Java, HTML/CSS, Racket

Systems: Linux, FreeRTOS, Raspberry Pi, x86, ESP32, STM32

Developer Tools: Git, GCC, GDB, Make, SQLite, MySQL