Colin Riker

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Summary

Computer engineer (B.S.E., December 2026) With prior firmware (in C & C++) and embedded development on STM32, ESP32 and Raspberry Pi. Built a custom real time event scheduler and implemented state machines. With experience utilizing I2C sensors, thermocouple, bluetooth, hardware PWM and NFC, networked devices over MQTT, and Wi-Fi. Looking for entry-level firmware and embedded engineering roles.

Education

University of Michigan, Ann Arbor - B.S.E. Computer Engineering, expected December 2026

- Coursework: Advanced Embedded Systems, Intro to Embedded Systems, Computer Architecture, Applied GPU Programming (CUDA), Principles of Optics, How to Make (Almost) Anything Interactive (graduate)

- Engineering study abroad, Prague, Czech Republic (2024)

Northwestern Michigan College, Traverse City
Associates of Sciences and Arts, with Honors, 2023

Projects

Phone Lock Box — A timed lock box that keeps a phone away during study, Intro to Embedded Systems, team of 4, Winter 2025
Wrote the core firmware and integrated every subsystem around a custom real time event scheduler and finite-state machine on an STM32 Nucleo; devices are polled only in the states that need them to cut overhead

- Built the I2C NFC phone-detection subsystem and interrupt-driven ringtone detection for an emergency unlock override
- integrated an I2C accelerometer, magnetometer lid sensing, timer-driven LCD and rotary encoder, and a MOSFET-driven solenoid lock

FirePatch — firefighter jacket with temperature-sensing and SOS patches, How to Make (Almost) Anything Interactive, team of 4, Fall 2025

-Built the temperature chain: K-type thermocouples, AD8495 amplifiers and cold-junction calibration, reading up to 650 °C against a 500 °C goal
-Wrote C/C++ to feed readings into the ESP32 hub, which streamed temperature, SOS status and GPS location over ad-hoc Wi-Fi to a live dashboard

DrawBot — Wall climbing robot that draws images on a whiteboard, Advanced Embedded Systems capstone, team of 6, Fall 2025

- Led mechanical design and fabrication of all subsystems in Fusion 360 across 9 FDM-printed iterations; redesigned for easier assembly, tool changing, and belt tensioning while cutting weight to a final 3.25 lb (10 lb limit)

- Integrated with a custom ESP32-S3 PCB running FreeRTOS tasks, PID drive control and OpenCV ArUco localization

R10K Out-of-Order Processor — 2-way superscalar CPU in SystemVerilog, Computer Architecture capstone, team of 6, Fall 2024
Wrote the first version of the reorder buffer and designed the load/store units and was on our testing and optimization team

- Final design: 1.34 benchmark-weighted CPI at a 9.5 ns clock; speculative loads cut CPI from 1.90 to 1.31

Experience

Embedded Systems Research Assistant — University of Michigan, Taubman College (Prof. Lars Junghans) | 2023–2024

- Built the embedded controller for an active heat-recovery ventilator in 2226 Midwest, a net-zero building research project
- Wrote a C fan controller for a Raspberry Pi Zero 2 using hardware PWM (pigpio)
- Linked the controller to the project's Raspberry Pi sensor and control nodes over MQTT and presented at the 2024 U-M Spring Symposium

Software Engineering Research Intern — DryvIQ, through U-M UROP | Summer 2022
- Improved open-source address-parsing regexes for finding personal data in documents: F-measure up 27.4% on a mixed-country set and 9.0% on a US set
- Built the Python evaluation tool (precision, recall, F-measure) and labeled datasets of 5,400+ addresses; presented at the 2022 UROP Symposium

Physics Lab Assistant — Northwestern Michigan College | 2022–2023
- Repaired lab equipment with soldering and light power tools, reducing replacement costs

Transportation Security Officer — Transportation Security Administration (DHS) | 2018–2021
- Screened passengers under strict federal procedures in a fast-paced, high-pressure environment

Skills

Languages: C, C++, Python, SystemVerilog / Verilog, CUDA, MATLAB
Embedded: STM32, ESP32, Raspberry Pi, Arduino, ARM, RISC-V, FreeRTOS, I2C, PWM, interrupts and timers, MQTT, Wi-Fi, NFC
Hardware & tools: oscilloscopes, logic analyzers, thermocouple amplifiers, soldering, KiCad, Fusion 360, FDM printing, Git, Linux (daily driver of 10 years)