**Erin Coulon** (she/her)

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**EDUCATION**

**University of Southern California** Los Angeles, CA

*M.S. Computer Engineering* Projected May 2026

*B.S. Computer Engineering and Computer Science* May2025

**Thesis:** Species-Specific Avian Call Detection and Intercall Modeling using Passive Acoustic Monitoring

**Relevant Coursework:** Computer Systems Organization, Embedded Systems, Data Structures, Algorithms, Distributed Systems and IOT, Network Security, MOS VLSI Digital Circuit Design, Probability Theory, Discrete Math, Operating Systems, Digital Circuits, ML Hardware Accelerators, Computer Architecture

**SKILLS**

**Programming Languages:** C++, C, Python, Verilog HDL, SystemVerilog, Bash

**Software:**  Embedded development (Yocto, STM32cube, Azure ThreadX RTOS), FPGA & Hardware Design (Vivado, Verilator, Cadence Virtuoso, Quartus), Version control and tooling (git, docker, gdb)

**Hardware Platforms:** Microcontrollers (Arduino, STM32, nRF, atmega328p), Microprocessors (RaspberryPi), FPGAs (Xilinx Artix-7, Xilinx Zynq-7000), debugging methods (oscilloscope, DMM), Serial Communication Protocols (UART, SPI, I2C, USB)

**RESEARCH EXPERIENCE**

**Massachusetts Institute of Technology** Cambridge, MA

*Graduate Researcher* Month YYYY– Present or Month YYYY

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**PROFESSIONAL EXPERIENCE**

**Johns Hopkins University Applied Physics Lab** Laurel, MD

*Embedded Software and FPGA Engineer* May 2025– August 2025

* Integrated a 3-axis accelerometer with a Mercury ST1 Zynq 7000 System-on-Module (SoM) to monitor physical disruptions in a free-space optical communications node
* Developed C code leveraging the Industrial I/O (IIO) subsystem within a PetaLinux environment to interface with the accelerometer sensor
* Collaborated as an FPGA engineer on the evaluation team for a custom ASIC, developing test setups to drive input signals and capture outputs for functional verification
* Developed embedded software for the FPGA board’s microprocessor, creating a command-line interface (CLI) to facilitate control and testing of FPGA functions
* Designed and implemented SystemVerilog testbenches and FPGA logic on Mercury ST1 and Zynq 7000 platforms using Vivado to validate ASIC performance

**Cisco Meraki – Core Product Team** San Francisco, CA

*Firmware Engineer* May 2024– August 2024

* Developed and optimized endpoints for Meraki networking devices using C and embedded Ruby to report real-time device status during firmware upgrades
* Implemented FastCGI to ensure seamless data reporting for device status, improving upgrade visibility on Meraki Dashboard
* Created a proof-of-concept live tool for the Dashboard using React and CSS to visually display device information in real-time

**Medtronic – Oximetry and Wearables Operating Unit, Patient Monitoring** Boulder, CO

*Firmware/Embedded Systems Engineer* June 2023– August 2023

* Integrated new generation microcontroller (STM32) and a real-time operating system (Azure ThreadX) with legacy devices to implement scalable and up-to-date oximetry firmware, developing python scripts to parse and visually display serial oximetry data

**LEADERSHIP AND SERVICE**

**SC Outfitters** Los Angeles, CA

*Wilderness Guide* May 2024 – Present

* Lead and plan backpacking, camping, and hiking trips throughout California for student participants

**USC Makers** Los Angeles, CA

*Director of Membership* September 2022– May 2024

* Created a streamlined application process, leveraging automated platform based on google sheets macros to anonymize over 200 applications and minimize reviewer bias
* Directed the deliberation process for new member selection, ensuring fair evaluation of applicants' fit with the club's values
* Fostered a diverse and inclusive work environment through developing and directing DEI training for over 20 community leaders

**ACADEMIC PROJECTS**

**The Biggest Day – Geospatial Route Optimization for Birdwatching** Los Angeles, CA

June 2025– present

* [DESCRIPTION HERE]

**Species-Specific Avian Call Detection and Intercall Modeling using Passive Acoustic Monitoring** Los Angeles, CA

*Autonomous Networks Research Group – Undergraduate Thesis* August 2024 – May 2025

* Conducted research on species-specific vocal behavior of Yellow-rumped Warblers using passive acoustic recordings collected on a university campus
* Utilized statistical analysis and signal processing libraries (e.g., NumPy, SciPy) to model inter-call interval distributions, addressing challenges such as overlapping calls and noise interference
* Developed and implemented multiple signal processing algorithms in Python—including threshold-based detection, matched filtering, and amplitude separation—to accurately identify Yellow-rumped Warbler vocalizations from passive acoustic recordings

**WanderCast --** Los Angeles, CA

*Embedded Systems Senior Capstone* April 2023

* Implemented an innovative IoT project featuring a an unconventional OLED display using a pickle as a unique medium, thermistor temperature monitoring, sound feedback, and twitter capabilities through ESP32 module

**Firmware Develoment, Testing, and PCB Design for the Analog Front End of Extended Gate** Los Angeles, CA

**Transistor-Based Electrochemical Sensing System – Khan Lab CURVE project**January 2024– April 2024

* Developed firmware to interface with the Analog Front End (ADS1299) with Arduino to provide bias to and to read voltage from NMOS transistors
* Designed a PCB (EAGLE) to facilitate connection between the transistor gate and working electrode of printed sensors

**Le Chord: The Electronic Autoharp** Los Angeles, CA

*USC Makers* September 2022 – May 2023

* Built an electronic autoharp using MIDI controller (Le Strum, Electrodistro DAISY) and designed breakout board (Eagle) and aesthetic casing (Fusion 360) to house electronics
* Utilized hardware debugging tools (oscilloscope, DMM) to troubleshoot hardware and connectivity issues

**SmartGlowPickle** Los Angeles, CA

*USC IEEE HackIOT Competition* April 2023

* Implemented an innovative IoT project featuring a an unconventional OLED display using a pickle as a unique medium, thermistor temperature monitoring, sound feedback, and twitter capabilities through ESP32 module