Jack Shi

Los Angeles, CA · jackmshi@ucla.edu · (858)-342-7329 · **LinkedIn**· **Portfolio**

Education

University of California Los Angeles — Los Angeles, CA
BS Electrical Engineering — September 2024 – June 2027
GPA: 3.94, Tau Beta Pi

- Coursework: Computer Architecture, Control Systems, Signal Processing, Circuit Analysis

Papers

Tang, Liu, Shirazi, Hennessy, **Shi**, Bhamidipati, Nambiar, Luo, Deak, Wang — San Diego, CA
OpenBabyographer: A Multimodal Open-Source Infant Wearable for Studying Naturalistic Interactions from an Egocentric Perspective *Paper Link (Not Published)*

Work Experience

University of California, Los Angeles – Emergence of Communication Lab — Los Angeles, CA
Lead Embedded Systems Engineer — November 2025 – Present

- Commissioned to design a lightweight, infant-worn sensing system for long-duration data collection, centered on a custom ESP32-S3 platform with high-quality audio codecs, analog MEMS & contact microphones, camera interface, & microSD storage; recruited and led a 5-person engineering team.
- Mixed-Signal, Power, & Mechanical Integration – Architected modular custom PCBs with isolated analog/digital domains, Li-ion power management & USB-C data offload; assembled & soldered electronics & iterated enclosures in Fusion 360 for reliable operation during infant movement.

University of California San Diego – Design Lab ECE Branch — San Diego, CA
Hardware Engineer – OpenBabyographer Project — April 2025 – September 2025S

- Embedded System Integration – Developed a wearable embedded sensing system using Raspberry Pi, integrating camera, MEMS microphone, & power management hardware for data acquisition.
- Hardware–Software Co-Design – Assembled & soldered custom circuitry; designed snap-fit enclosures in Fusion 360 & iteratively refined sensor placement to ensure robustness, durability, & stable operation.

San Diego State University – ECE Department *GitHub Link* — San Diego, CA
Hardware Engineer – Waveform Generator GUI Project — May 2023 – August 2023

- Developed MATLAB software to control multiple Agilent 33220A generators via USB, using oscilloscope feedback for synchronized signal output & centralized management through a custom GUI.
- Created a data-streaming algorithm to bypass the 64 k-sample memory limit by segmenting waveform chunks, enabling continuous high-resolution playback & precise phase alignment.

Featured Projects

Dining Buddy Smart Keychain Project *GitHub Link* — May 2025 – October 2025

- Engineered firmware architecture in C++ on an ESP32-C3 implementing Wi-Fi connectivity, HTTP parsing, flash memory management under a 4 MB storage constraint, data caching, and low-power state control using deep sleep and timed wake-ups for energy-efficient operation.
- Designed and fabricated a compact ESP32-C3 PCB with OLED display and button interface; created snap-fit, 3D-printed enclosures in Fusion 360 for portable, consumer-style deployment.

ESP32 IoT Remote Device Control Project *GitHub Link* — February 2025 – May 2025

- Developed embedded C++ firmware on an ESP32 to remotely control GPIO through the Telegram Bot API, enabling secure, internet-based device actuation without exposing network ports.
- Migrated a Raspberry Pi–based web control system (Python + Next.js) to a ESP32 architecture, integrating Wi-Fi networking, command parsing, and relay/servo control for reliable remote operation.

FFT Biometric Door Lock *GitHub Link* — February 2025 – March 2025

- Implemented real-time C++ firmware on an ESP32 implementing real-time FFT-based frequency-domain processing for unique authentication signatures in a resource-constrained system.
- Integrated ADC/DAC signal generation and acquisition with interrupt-driven sampling, noise mitigation, and spectral detection, validating system behavior through instrumentation and on-device visual feedback.

Skills

- **Programming Languages:** C++, C, MATLAB, SQL, Shell Script, Python, JavaScript, Verilog,
- **Software Tools:** Kicad, Fusion360, Vivado, LTspice, Git, Postman, React Native
- **Hardware Platforms:** ESP32, Raspberry Pi, RP2040, STM32, Arduino, FPGA (Xilinx),