Akshera Paladhi

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EDUCATION

University of California Santa Cruz, Santa Cruz, CA — Sept 2024 – Expected June 2028
B.S. Electrical Engineering, Minor in Astrophysics
GPA: 3.63/4.0 **(Dean's Honor List)**

- **Relevant Coursework**: Electronic Circuits, Introduction to Electricity Industry, Computer Systems and C Programming, Computer Systems and Assembly Language, Scientific Computing, Introduction to Physics I: Mechanics, Introduction to Electricity and Magnetism, Waves, Optics, and Thermodynamics, Linear Algebra, Differential Equations

SKILLS

- **Software & Programming:** C, C++, Python, MATLAB, STM32, PIC32, Arduino IDE, Linux (Bash/Shell), Git, Siemens NX, KiCad, LTspice, AutoCAD, STM32Cube, SQL, Microsoft Office Suite (Excel, Word, PowerPoint, Outlook)
- **Engineering & Technical Tools:** Oscilloscopes, Multimeters, Microcontrollers (RP2040, ESP32), FPGA, VHDL, Verification & Validation (V&V) testing, Root Cause Analysis, EHS Standards, Precision Soldering
- **Certifications:** Certificate of Completion NPWEE Summer 2025 L'SPACE **(**August 2025 – Present)

EXPERIENCE

Citrus Drone Initiative for Drone Education and Research — **Santa Cruz, CA**
Incoming Researcher — *July 2026 - Sept 2026*

UCSC Institute of Particle Physics (SCIPP) — **Santa Cruz, CA**
Undergraduate Researcher — *June 2025 – Present*

- Applying circuit analysis to simulate and continuously improve the robustness of the high-speed front-end electronics using LTspice for the Diamond Submerged Wireless Imaging Monitor (SWIM) project
- Designing a signal-shaping circuit by applying schematic design and debugging skills to stabilize ultra-short detector pulses for proton beam diagnostics at Los Alamos National Lab (LANL), ensuring reliable performance
- Developing C firmware on an Arduino Nano RP2040 Connect for real-time data acquisition to monitor particle beam profiles and resolve hardware-software integration issues
- Leveraged Python scripting in a Linux to automate real-time testing of Thorlabs cameras, evaluating sensor response and data integrity across various wavelengths

UC Santa Cruz Quantum Computing — **Santa Cruz, CA**
Vice President/Researcher — *August 2025 – Present*

- Leading a 10+ member research group in the study of Position-Based Quantum Cryptography (PBQC), applying strong analytical skills to develop secure authentication and data protection frameworks
- Collaborating with 3+ UC campuses and the Quantum Coalition to expand shared research resources

Learning Support Services — **Santa Cruz, CA**
Engineering Tutor — *Sept 2025 – Present*

- Mentoring 15+ students weekly by simplifying concepts in computer systems, digital logic, CMOS gates, transistors, Boolean algebra, and RISC-V architecture into practical problem-solving strategies

PROJECTS

Air Mouse (ESP32 + MPU-6050) — *Dec 2025 – Present*

- Developing a wireless motion-controlled robotics interface using an ESP32 microcontroller and MPU-6050 IMU
- Implemented sensor fusion and custom filtering algorithms in C to translate real-time inertial data into precise navigation via Bluetooth HID integration
- Designing a custom PCB in KiCad and executing precision SMD soldering to deliver production-ready hardware

Embedded Systems BattleBoats Game — *May 2025 – June 2025*

- Created a two-player Battleship game in Embedded C for PIC32/STM32 with real-time UART communication
- Coded a Finite State Machine (FSM) to synchronize game flow across start, attack, and defense states
- Built a secure negotiation protocol using hashed keys and secret numbers to prevent cheating and verify turn order

Haptic Wearable Research Project — *Apr 2025 – Aug 2025*

- Built an Arduino haptic wearable to help the deaf community experience music by converting real-time audio into vibrations
- Implemented FFT-based signal processing on an 8-bit microcontroller to map frequencies to multiple haptic outputs
- Optimized memory usage using Fixed FFT-8 with in-place computation for efficient real-time performance