Cassia Rizq

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Electrical engineer with cross-disciplinary expertise in implantable/wearable systems, mixed-signal ASIC/PCB design, neural engineering, and optical systems. Experienced in low-noise analog front ends, power- and size-constrained designs, and BCI/medical device development. Passionate about enhancing quality of life through cutting-edge devices.

EDUCATION

B.S. Electrical Engineering (Depth in Optics) & B.S. Human Biology | UC San Diego (GPA: 3.67) AUG. 2020 - DEC. 2024

SKILLS

Analog & PCB Design | Schematic Capture (PSpice, LTSpice), Mixed-Signal ICs (Cadence Virtuoso, TSMC 180nm HV), PCB Design (KiCAD), Low-Noise Analog Interfaces, Bioinstrumentation, Power Management, Low noise layout, ESD protection

Programming & System Integration | Python, MATLAB, C, Embedded Systems, Firmware-Aware Design, Instrument Control & Automation, Simulation (Monte Carlo, Spectre), RTL Design & Debug, Debugging & Soldering, Data Analysis

Technical Proficiency & Lab Skills | Oscilloscopes, Logic Analyzers, Power Sources, Function Generators, Prototyping, Troubleshooting, High accuracy voltage/current sources, ADC/DAC applications

EXPERIENCE

Researcher | ***Integrated Systems Neuroengineering Lab(ISNL)*** | UCSD Bioengineering MAR. 2022 - DEC. 2024

Designed and implemented transistor-level analog and digital blocks for a 64-channel neural stimulator ASIC (TSMC 180nm HV) targeting drug-resistant epilepsy. Led schematic capture, simulation, layout, verification, and tapeout. Supported full-system integration to minimize parasitics across analog stimulation circuits and digital control logic.

BCI Buddy | ***Co-Founder & CEO*** | The Basement at UC San Diego MAR. 2024 - PRESENT

Designed PCBs, embedded firmware, and software interface for educational BCI kits. Managed product development, silicone fabrication, and team operations. Built and deployed interactive curriculum for EEG/EMG-based learning.

Researcher | ***de Sa Lab*** | UCSD Cognitive Science JUN. 2023 - PRESENT

Led signal acquisition testing and design of zinc-based wearable dry electrodes. Characterized performance through electrochemical impedance spectroscopy and electromyography. Published a first-author paper at IEEE EMBC 2024.

TECHNICAL LEADERSHIP & TEACHING

Lab Developer and Tutor | ***COGS 189 Brain Computer Interfaces*** JAN. 2025 - MAR. 2025

Developed electrophysiology labs for 200+ students. Designed BCI-focused hardware/software, created instructional materials/labs, and taught EEG/EMG signal acquisition and analysis. Advised 30+ final projects involving custom BCIs.

Co-President, Project Lead | ***Triton NeuroTech*** DEC. 2020 - JUN. 2024

Scaled organization 10x through partnerships and project leadership. Led several project teams to research, design, and build custom neurotechnology devices/software. Founded TNT Academy to create student-made STEM tutorials.

Undergraduate Instructional Assistant | ***ECE 65 Components and Circuits Lab*** SEP. 2022 - JAN. 2023

Taught analog/digital circuit design using tools such as PSpice, LTSpice, oscilloscopes, function generators, and power supplies. Developed adaptive teaching methods to support diverse learning styles.

PROJECTS & AWARDS

EMG-Controlled Mouse | Designed concentric ring electrodes + band; 2nd place + neuroethics prize (NeuroTechX Global)
2NI Neural Interface | Designed 2-channel EMG/EEG board & armband; deployed 15+ low-cost units at HARD Hack
EMG Prosthetic Arm | Led embedded software/hardware dev for external neural prosthetic using custom EMG armband
IEEE EMBC NextGen Scholar | Awarded to select graduate/undergraduate first authors on accepted papers