# CEDAR ROSE D. LEACH

cdleach@usc.edu | (310) 938-7235 | www.linkedin.com/in/cedar-rose-leach | Portfolio: https://cedarroseleach.com

## EDUCATION

**University of Southern California** Class of 2027
B.S. in Electrical and Computer Engineering | GPA: 3.96 Los Angeles, CA

## SUMMARY

Engineer and researcher experienced in creating software solutions across full-stack applications, embedded systems, and applied machine learning. Built and deployed production-ready apps, optimized algorithms, and integrated hardware–software systems through internships, research, and startups. Founder of an accessibility app and published co-author with a strong track record of applying CS + EE skills to deliver real-world, scalable solutions.

## EXPERIENCE & INVOLVEMENT

**Memoir Photos,** *Co-Founder* September 2024-Current
- The only audio-based photo library aiding the visually impaired in experiencing their memories
- Built and deployed full-stack mobile app; Integrated scalable database, authentication, and LLM APIs for image captioning
- 1st place at Trojan Tank Pitch Competition and Loyd Grief Catalyst Micro Grant; 50+ blind users, $6K+ in funding

**Northrop Grumman,** *Intern* June 2025-August 2025
- Validated wafer discharging agents for electron beam lithography through resistivity and transistor gate alignment experiments
- Optimized spin-coating procedures; Evaluated exposure performance across test lots, yielding $26,000 in annual cost savings

**Center for Undergraduate Research in Viterbi Engineering (CURVE)**, *Research Fellow*
**Biomedical Microsystems Lab**, *Funded by CURVE Fellowship and USC Provost Fellowship* June 2024-May 2025
- Designed, fabricated, and characterized a hybrid silicon-polymer neural recording probe
- Conducted COMSOL Multiphysics simulations (magnetic fields, inductance, Q-factor, resonant frequency)
- Designed PCB to evaluate inductive coupling efficiency of primary coil compatible with RF low amplitude signals

**Khan Lab**, *Funded by CURVE Fellowship* January 2024-May 2024
- Developed firmware; tested, and designed PCB for the analog front end of an extended-gate transistor-based electrochemical sensing system
- Programmed microcontrollers to acquire and process EEG signals from potassium-ion sensing of printed wearable sensors
- CADed models of printed wearable sweat rate sensor; figures published in paper

**USC Makers**, *Engineer* September 2023-Current
- Programmed an EEG-controlled drone through a custom brain-controlled interface
- Developed SmartTender, an autonomous robotic system with embedded control software and sensor integration.

**California Dreams DOD Microelectronics Commons Scholars**, *Intern* June 2024-July 2024
- Trained and certified in semiconductor nanofabrication processes and safe chemical handling in a cleanroom
- Practiced machine operation and fabrication techniques: photolithography, etching, deposition, wafer cleaning & handling

**FIRST Robotics Team 2637**, *Team Member & Lead Technical Mentor* October 2019-June 2023
- Established and mentored an inaugural all-girls FIRST LEGO League robotics competition team for elementary school students
- Earned the *Core Values Award* recognizing gracious professionalism, advanced to Southern California State Championship

**Boeing**, *Intern* June 2022-August 2022
- Configured FPGA (Versal VCK 190) and studied GPS satellites, flight mission, space environment
- Winner of the LINC Innovation Challenge for concept of Boeing's campus navigation to optimize collaboration; recognized by the President and the Executive Director of Human Resources for Boeing Commercial Satellite Systems

## PUBLICATIONS

N. D. Barrera, D. Nguyen, E. Ramirez, **C. D. Leach**, N. Abbasi, A. Molisch, C. Sideris, E. Meng, "Implantable Flexible GHz Waveguide for High Data Throughput Neural Recording Interfaces", in *Neural Interfaces 2025*. Arlington, VA, USA, June 2025.

Islam, M.S., Cha, S., Hassan, M.F., Cai, W., Saniat, T.S., **Leach, C.R.** & Khan, Y. "Printed Wearable Sweat Rate Sensor for Continuous *In Situ* Perspiration Measurement". *Advanced Intelligent Systems, 2025*. https://doi.org/10.1002/aisy.202400927

## SKILLS

**Programming:** Python, C++, Java, React Native, Verilog, SQL, MATLAB
**Software/Tools:** COMSOL, Altium Designer, CAD, Git, Supabase, VLSI design, Verilog, Vivado, Figma
**Skills:** Machine learning (NLP, data preprocessing, LLM API integration, model training, prompt engineering), embedded systems, digital logic, microelectronics, cleanroom fabrication, PCB design, Front-end dev., Web design
**Creative:** Graphic design, Product Design & Development, Woodworking, Resin, Sewing, Ceramics, Painting