Vivian Zeru
Willing to Relocate | *502-415-1280* | *vivianzeruportfolio.vercel.app* | *vivian.zeru@vanderbilt.edu* | *linkedin.com/in/vivian-zeru*

Education

MS in Electrical & Computer Engineering | *Vanderbilt University* *Expected May 2027*
- Accelerated Graduate Program in Engineering: Receiving MS/BE degrees in 4 years concurrently.
- Coursework: Electronics 2 (Analog Circuits), VLSI Design (Cadence, AWS), Advanced Digital Electronics (Transistor-Level Digital Circuit Design)

BE in Electrical & Computer Engineering | *Vanderbilt University (GPA: 3.64)* *Expected May 2027*
- Cornelius Vanderbilt Scholar: Awarded to <1% of applicants for high academic/community achievement
- Coursework: Analog Circuits/Systems, Microelectronic Systems, Electronics 1, Electromagnetics, Microcontrollers (AVR), Rapid Prototyping (Arduino, Fusion 360 CAD)

Hardware Experience

Undergraduate Research Assistant: Hardware Team | *SYMBIO-X Lab* *Feb 2025 –Present*
- Designing and prototyping novel mixed-signal Eagle PCBs for wearable medical applications, utilizing antenna design, wireless charging, and ADCs with a focus on miniaturization and ultra-low power consumption.
- Executed precise SMD soldering techniques on QFN/WLCSP microscopic components for high-reliability assembly (PCBA) on 2 wearable hardware sensors for medical health monitoring.
- Performed system-level validation of low-power wearable PCBs using multimeters and firmware flashing, enabling functional biosensor.

Electronics Engineer for Stormwater Runoff Device | *Engineers Without Borders* *Sep 2023 –Present*
- Assisted in hardware design of a 2-layer sensor PCB (EasyEDA) to reduce device footprint; collaborated with mechanical teams on system integration within a 3D-printed enclosure.
- Decreased microcontroller power consumption by ***99.9%*** (150 mA to 20 μA) using deep sleep mode every 15 seconds in collaboration with programming/CS teams.

Undergraduate Laboratory Assistant and Lab Proctor | *ECE Tech Crew* *Aug 2024 –Present*
- Assisted students in Electronics 1 Laboratory in analyzing, debugging, & designing diodes, MOSFETs, BJTs, amplifiers, and CMOS circuits.
- Managed ECE Makerspace 2-3 hours weeky to ensure component safety/quality and help students with projects.

Hardware Projects

Custom ESP32 Environmental PCB Sensor | *Eagle, System-Design, PCB Design, I2C, C++* *Jun – Aug 2025*
- Developed board design for 2-layer Eagle PCB sensor system prototype (schematic + board layout) to detect temperature, humidity, pressure, altitude: BME280.
- Completed hardware system integration with USB-C power integrity delivery system with low-noise LDO regulator & 40 kHz crystal oscillator for stable operation.
- Optimized board layout for miniaturization, achieving a 25% size reduction while manually routing to ensure signal integrity for production.

4-Bit Multiplier IC (In Progress) | *Cadence Virtuoso, HSPICE, Hierarchical Design, Physical Verification Sep 2025*
- Architecting a complex 4-bit multiplier IC using a bottom-up, hierarchical methodology, constructing the system from transistor-level standard cells into 4 half-adders and 8 full-adders to implement the multiplication algorithm.

VLSI Gates & 4-Bit Adder ICs | *Cadence Virtuoso, AWS, VLSI Design, Backend Design* *Aug – Sep 2025*
- Designed a 45 nm node standard cell library (Inverter, NAND, NOR gates) at the transistor level, optimizing cell layout for area/performance with a 10-track height design.
- Designed half-adder, full adder, 2-bit adder, 4-bit adder, utilizing hierarchal layout design & optimized NAND.
- Conducted system validation to ensure manufacturability by executing full physical verification (DRC, LVS, PEX), resulting in a clean, tape-out ready standard cells.

Leadership and Professional Experience

Founding Member | *ECE Tech Crew* *Feb 2024 – Present*
- Trained 9 students in Keysight tools for debugging circuits in senior design & research (oscilloscopes, multimeters).
- Grew organization membership by >300% (7 to 30+ members) through targeted marketing/outreach initiatives.
- Chosen to present to ECE External Advisory Board & national ABET accreditation for success in ECE.

2025 Vice President and Fall 2024 Secretary | *Engineers Without Borders* *Oct 2024 –Present*
- Fostered strong internal and external stakeholder relationships by managing logistics and communicating initiatives to a 10+ member team, driving project continuity.

Information Services Management (ISM) Intern | *UPS* *Jun 2024 – Aug 2024*
- Presented technical project results to executive leadership, demonstrating advanced communication skills.
- Collaborated on a cross-functional team in a high-pressure hackathon to develop a prototype, finishing top-9 among 53 teams.

Technical Skills

Hardware Design/Simulation : Eagle, Altium, SPICE (LTspice), Fusion 360 (CAD), Cadence Virtuoso (VLSI)
Hardware Debugging/Assembly : Oscilloscopes, Multimeters, DC Power Supplies, SMD Soldering (QFN/WLCSP), PCBA, Function Generators
Embedded Systems, Protocols, Programming : C/C++, Python, Arduino, AVR Assembly, I2C, SPI, UART, Git