Vivian Zeru
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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* *Expected May 2027*
- Cornelius Vanderbilt Scholar: Awarded to <1% of applicants for high academic/community achievement
- Dean's List All Semesters (x4): Awarded for high GPA achievement (>3.5).
- Coursework: Analog Circuits/Systems, Microelectronic Systems, Electronics 1, Electromagnetics, Microcontrollers (AVR), Rapid Prototyping (Arduino, Fusion 360 CAD)

Hardware Experience

Hardware Engineering Intern - Device Accessories EE | *Apple* *Jan 2026 –Present*
- Assist in the design, test, and measurement of a variety of electrical systems (iPhone, iPad, Audio, and Vision Pro accessories and competitive products).

Undergraduate Research Assistant: Hardware Team | *SYMBIO-X Lab* *Feb 2025 –Oct 2025*
- Selected analog front end chips and conducted schematic capture for EDA/GSR emotion detection sensing in existing EEG sensor design in Eagle.
- 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

8-Bit Booth Multiplier | *Cadence Virtuoso, HSPICE, Hierarchical Design, Physical Verification* *Nov/Dec 2025*
- Implemented complex 8-bit multiplier IC using Booth's algorithm (encoding/decoding) for faster multiplication by decreasing the maximum necessary additions from 7 to 3 compared to the parallel multiplier methodology.
- Utilized the carry lookahead adder (CLA) with Manchester Carry Chain (MCC) for faster addition within the Booth algorithm compared to the ripple-carry adder by decreasing the gate delays.
- Conducted full physical verification (DRC/LVS) and pre/post layout simluation in HSPICE to increase reliability.

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.

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 high-pressure hackathon to develop prototype, finishing top-9/53 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