

# Vivian Zeru

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in vivian-zeru    🌐 vivian-lz

## Education

### Vanderbilt University

Aug 2023 – May 2027

*Bachelor of Engineering in Electrical and Computer Engineering*

- **Coursework (by Summer 2026):** Microelectronic Systems, Microcontrollers (AVR), Embedded Systems, Electronics 1, Electromagnetics, Analog Circuits/Systems, Digital Systems (RISC-V), Circuits, Rapid Prototyping
- **Cornelius Vanderbilt Scholar:** Awarded to <1% of applicants for merit-based leadership & community achievement.

### Vanderbilt University

Aug 2025 – May 2027

*Master of Science in Electrical and Computer Engineering*

- **Coursework:** Electronics 2 (Analog), Advanced Digital Electronics (Transistor-Level Design), VLSI Design (Cadence)
- **Accelerated Graduate Program in Engineering:** Accepted for reaching senior standing by end of sophomore year (86 credits required, 92 completed) & 3.5+ GPA to earn 2 degrees simultaneously in 4 years.

## Professional Experience

### Undergraduate Research Assistant - Electrical Engineering Team

Nashville, TN

*Du Group Vanderbilt*

Feb 2025 - Present

- Performed schematic circuit analysis on pH sensor to study physical circuit design.
- Executed precise SMD soldering techniques on QFN/WLCSP microscopic components for high-reliability assembly (PCBA) on 1 wearable hardware sensor for ECG, EEG, and NIRS health monitoring.
- Debugged and validated low-power wearable PCB using multimeters and firmware flashing, enabling functional biosensor.

### Electronics Engineer for the EPA Rainworks Project (Stormwater Runoff Device)

Nashville, TN

*Engineers Without Borders USA - Vanderbilt University Chapter*

Sept 2023 - Present

- Designed 2-layer PCB (EasyEDA) with ESP8266 & sensors to decrease space & fit mechanical-design constraints for Solidworks-designed 3D-Printed box; debugged to improve layout signal integrity.
- Decreased microcontroller power consumption by 99.9% (150 mA to 20  $\mu$ A) using deep sleep mode every 15 seconds.

### Information Services Management (ISM) Intern

Louisville, KY

*UPS (United Parcel Service)*

Jun 2024 - Aug 2024

- Developed/deployed scheduling feature for nationwide aircraft maintenance employee management system application in production today for 2285 monthly users; selected to present to executive leadership for clarity and technical depth.
- Created real-time asset tracking app in 24-hour hackathon, enabling \$33M savings; selected top 9 of 53 teams.

## Technical Projects

### Custom ESP32 Environmental PCB Sensor

Jun 2025 - Present

- Developed 2-layer PCB (schematic+layout) in Eagle to detect temperature, humidity, pressure, & altitude with BME280.
- Developed system with USB-C, 5-3 V LDO, 40 kHz Crystal, CP2102 USB-UART, I2C, & C++ firmware.
- Achieved 25% size reduction with ICs; placed and routed layout to ensure signal integrity for manufacture-ready device.

### Plant Health Monitoring Device

Jun 2025 - Present

- Created ESP32 module powered Eagle PCB and firmware (C++) to detect plant needs (BME280, soil moisture, BH1750).
- Developing IC design to decrease space & control design; implementing ML processing to predict next plant watering.

### 4-Bit ALU (Arithmetic Logic Unit)

Jun 2025 - Jul 2025

- Implemented 2 scalable design methodologies in Verilog: behavioral (cases) & structural (gate-level hardware).
- Built 1 testbench for 100% design verification, Synopsys VCS simulating 6.74% decrease in CPU runtime (structural).

## Leadership Experience

### Vice President (2025) and Secretary (Fall 2024): Executive Board

Nashville, TN

*Engineers Without Borders USA - Vanderbilt University Chapter*

Oct 2024 - Present

- Manage internal/external logistics and communicate to 10+ members via weekly emails & 8+ Instagram posts.

### Lab Proctor and Founding Member

Nashville, TN

*ECE Tech Crew*

Feb 2024 - Present

- Trained 9 students in Keysight tools for debugging circuits in senior design & research (oscilloscopes, multimeters).
- Drove membership from 7 to 30+ with merchandise, flyers, signs; communicating on Slack/email with students & faculty.
- Chosen to present to the ECE External Advisory Board (10+ faculty) at Vanderbilt on behalf of the organization.

## Skills

**Hardware Design/Simulation:** Cadence, AWS, Verilog, SPICE (LTSpice), Eagle, Altium, Intel Quartus/ModelSim, Fusion 360, Mathematica

**Embedded Systems:** C++ (Arduino), C (STM32), Python (Raspberry Pi), Assembly (RISC-V, AVR)

**Lab & Tools:** Oscilloscope, Multimeter, Waveform Generator, Power Supply, SMD Soldering (QFN/WLCSP), Soldering Iron, PCB Assembly