

Vivian Zeru

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TECHNICAL SKILLS

Hardware Design/Simulation : Cadence (with Amazon WorkSpaces) for VLSI Design, Eagle, Altium, SPICE (LTSpice), Verilog, Intel Quartus/ModelSim, Fusion 360
Hardware Debugging/Assembly : Oscilloscopes, Multimeters, Function Generators, DC Power Supplies, SMD Soldering (QFN/WLCSP), Soldering Irons, PCBA
Embedded Systems : Arduino (C++), Python (Raspberry Pi) STM32 (C), Assembly (AVR, RISC-V)
Masters Coursework : Advanced Digital Electronics (Transistor-Level Digital Circuit Design), VLSI Design (Cadence, AWS), Electronics 2 (Analog Circuits)
Bachelors Coursework : Microelectronic Systems, Microcontrollers (AVR), Electronics 1, Electromagnetics, Analog Circuits/Systems, Digital Systems (RISC-V), Rapid Prototyping (Arduino, Fusion 360 CAD)

EXPERIENCE

Undergraduate Research Assistant: Hardware Team | *Du Group Vanderbilt* *Feb 2025 –Present*
– Designing a PCB in Eagle to track eye movement for medical applications (autonomy, etc.).
– 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 with multimeters and firmware flashing, enabling functional biosensor.
Electronics Engineer for Stormwater Runoff Device | *Engineers Without Borders* *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 μ A) using deep sleep mode every 15 seconds.
Information Services Management (ISM) Intern | *UPS* *June 2024 – August 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.

EDUCATION

MS in Electrical & Computer Engineering | *Vanderbilt University (GPA: Start Aug 2025)* *Aug 2025 – May 2027*
BE in Electrical & Computer Engineering | *Vanderbilt University (GPA: 3.64)* *Aug 2023 – May 2027*

PROJECTS

Custom ESP32 Environmental PCB Sensor | *Eagle, System-Design, PCB Design, I2C, C++* *Summer 2025*
– 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; manually routed layout to ensure signal integrity for manufacture-ready device.
Plant Health Monitoring Device | *Eagle, System-Design, PCB Design, I2C, C++* *Summer 2025*
– 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) | *Verilog, Synopsys VCS, Digital Systems* *July 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).

AWARDS

Accelerated Graduate Program in Engineering | *Receiving MS/BE degrees in 4 years* *January 2025*
Cornelius Vanderbilt Scholar | *Given to <1% of applicants for high academic and community achievement* *April 2023*

LEADERSHIP EXPERIENCE

Lab Proctor and Founding Member | *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.
– Managed ECE Makerspace 2-3 hours weekly to ensure the safety/quality of components and help students with electronics projects.
– Chosen to present to the ECE External Advisory Board (**10+ faculty**) at Vanderbilt on behalf of the organization.
2025 Vice President and Fall 2024 Secretary | *Engineers Without Borders* *Oct 2024 –Present*
– Manage internal/external logistics and communicate to 10+ members via weekly emails & 8+ Instagram posts.