Isaac Miguel Giraldo

(615)-775-7872 | IMiguelGiraldo05@gmail.com | www.linkedin.com/in/MiguelGiraldo | Columbia, Tennessee 38401

EDUCATION

Vanderbilt University **Aug 2023 - May 2027**

Bachelor of Engineering, Electrical and Computer Engineering (GPA: 3.3/4.0) *Nashville, Tennessee* *Nashville, TN*

- **Coursework:** Digital Systems Design, Circuit Design, Electronics, Bipolar Junction Transistor Amplifier Design, Rapid Prototyping, Microelectronic Systems, VLSI Design, Microcontrollers, Electromagnetics, Analog circuits
- **Technical Skills:** Python, Java, System Verilog, C++, PCB Design, Microcontrollers, Autodesk Fusion 360, Mathematica, VLSI Design, FPGA, Linux Operating System, VHDL, Logic Design, Timing Analysis
- **Memberships:** Scalable Asymmetric Lifecycle Engagement (SCALE), Mexican American Student Association, Association of Latin American Students, Institute of Electrical and Electronics Engineering (IEEE), ECE Tech Crew, Beta Theta Pi, Alpha Psi Lambda

PROFESSIONAL EXPERIENCE

Institute for Space & Defense Electronics | *Electrical Engineering Intern* | *SCALE* **May 2024 - Aug 2024**

- Developed Python programs that reduced ion beam data analysis time by 30%, enhancing lab efficiency and enabling expedited research and testing.
- Engineered microcontroller-based circuits to simulate Single Event Transient responses under radiation conditions, contributing to rigorous hardware analysis and experimental validation.
- Designed and fabricated printed circuit boards to replicate Single Event Transient responses, facilitating precise data collection and showcasing strong detail orientation.

PERSONAL PROJECTS

Seven-Segment Display Decoder **Sep 2024**

- Designed and implemented a combinational logic decoder to drive a seven-segment display from binary inputs, emphasizing correctness across all input combinations.
- Derived complete truth tables and minimized Boolean expressions for each segment before implementing the design in Verilog RTL.
- Verified functional correctness through simulation and hardware testing, ensuring deterministic behavior suitable for synthesis and verification workflows.

Electronics II Class Project: Wireless Personal Area Network (PAN) Receiver Amplifier **Apr 2025**

- Successfully designed a multi-stage amplifier with a gain of 65 dB ± 1.5 dB and bandwidth from 100 kHz to 5.8 MHz
- Conducted simulations using LTSpice to verify design performance, achieving high accuracy in frequency response, impedance matching, and power consumption within a 12mA power budget from a 6V supply.
- Ensured input impedance matching to 75ohm output impedance below 75ohm efficient signal transfer to the demodulation circuit.

Mixed-Signal Reliability Project: LM324 Radiation Effect Emulation **June 2024**

- Designed a hardware platform to emulate radiation-induced transient effects in analog circuits using an LM324 operational amplifier.
- Injected controlled signal disturbances to model non-ideal behavior such as transient faults and recovery dynamics.
- Characterized circuit response under stress conditions, focusing on stability, degradation, and robustness beyond nominal operation.

Rapid Prototyping Class Project: Syringe Pump Design and Implementation **Oct 2024**

- Led electrical design for a syringe pump prototype, overcoming challenges in precise fluid dispensation by integrating advanced feedback mechanisms and optimizing power consumption for continuous operation in medical research.
- Programmed Arduino microcontroller for precise fluid dispensation, with adjustable flow rates and compatibility with multiple syringe sizes.
- Used Fusion360 for CAD design and Arduino IDE for programming, optimizing the device for use in medical and research settings.

LED Matrix GIF Display (Embedded Digital Systems) **Apr 2025**

- Designed an embedded system to render animated GIFs on an RGB LED matrix, emphasizing deterministic refresh timing and data-path correctness.
- Implemented pixel-mapping and frame-update logic under memory and bandwidth constraints, optimizing frame rate and visual stability.
- Debugged timing-related artifacts and synchronization issues, reinforcing a verification-oriented approach to hardware-driven display systems.

LEADERSHIP & EXTRACURRICULARS

Vanderbilt University IEEE Student Branch | *Vice-President* **Aug 2024 - Present**

- Coordinated communication between 100+ members and faculty, streamlining event announcements and information sharing.
- Organized 5+ professional development workshops and networking events, contributing to members' career growth.
- Assisted in the planning of annual conferences, improving event attendance by 25%.