

Ray S. Johnson

(503) 572-3083 | ray.s.johnson@vanderbilt.edu | linkedin.com/in/ray-s-johnson | www.raysjohnson.com

EDUCATION

Vanderbilt University

B.S. in Electrical and Computer Engineering, Minor in Computer Science

Relevant Coursework: Circuits, Program Design and Data Structures (Java), Analog Circuits and Systems, Intermediate Software Design (C++), Digital Systems and Laboratory

Nashville, Tennessee

May 2028

Fundación Colegio Americano de Quito

GPA: 3.97/4.00 • SAT: 1500 • IB Diploma

Quito, Ecuador

September 2020 – July 2024

EXPERIENCE AND PERSONAL PROJECTS

Avionics Design for Autonomous Drone

January 2025 – Present

- Designed a two-board avionics system in Altium optimized for autonomous flight and adaptable across multiple airframes.
- Integrated 3 STM32 MCUs, 3 flight sensors (IMU/barometer/mag), GPS, 2.4GHz LoRa, 4 BLDC drivers, and regulated power across two stacked 6-layer PCBs (Flight Computer + Power/Actuation), to reduce EMI and improve RF integrity.
- Hand-soldered 200+ components and completed structured hardware bring-up with STM32 firmware in C for validation.
- Utilized oscilloscopes to verify signal integrity across power and communication lines, ensuring functionality and reliability.

Vanderbilt Aerospace Design Laboratory

Electrical Engineer

Nashville, Tennessee

September 2025 - Present

- Wrote critical flight software in C++ on Teensy, engineered rocket logic and state machine to ensure operational reliability.
- Developed full wiring plan for a Teensy-based payload, integrating IMU, 2 soil sensors, a DC motor, and regulated power.
- Designed a Teensy breakout PCB in Altium, integrating connectors and circuitry for the parachute deployment system.
- Contributed to NASA-bound design reports, detailed wiring documentation, and subsystem verification for flight readiness.

Drone Propeller Efficiency Experiment

November 2022 – June 2023

- Collaborated with a PhD candidate to design test stand analyzing the efficiency of 3D-printed propellers at <4.2% error rate.
- Built Python UI streaming 19-field telemetry to 8 live plots, CSV logging, for autonomous execution with manual override.
- Developed STM32 firmware in bare-metal C with a 10 Hz PID control loop, 5-mode state machine, and 12 peripherals.

Vanderbilt Robotics Club

Navigation and Guidance Software Engineer

Nashville, Tennessee

September 2024 – March 2025

- Gained hands-on experience with ROS architecture, node communication, and sensor integration for robotics applications.
- Implemented EKF sensor fusion on IMU gyro/accel data to deliver robust real-time position and velocity estimates.

Self-Driving Car & Simulation

December 2021 – April 2022

- Built a 3D simulation in Unity, training a machine learning model with reinforcement learning to drive autonomously.
- Integrated physics-based dynamics to create a highly realistic driving environment for AI training and model optimization.
- Handcrafted a physical road for a small car powered by a Raspberry Pi to test and showcase self-driving capabilities.

OTHER WORK EXPERIENCE

Vanderbilt Campus Dining

Food Prep Student Associate

Nashville, Tennessee

January 2025 – September 2025

- Maintained efficiency and quality making ~100 sandwiches per shift while ensuring safety and coordination under pressure.

Fred Meyer

Deli Clerk

Portland, Oregon

July 2023 – August 2023

- Processed 150+ orders per day in a fast-paced grocery environment, providing efficient and accurate food preparation.

COMMUNITY SERVICE

Community Outreach for Underprivileged Preschools

Volunteer Educator

Quito, Ecuador

September 2019 – August 2022

- Dedicated 100+ hours teaching 30+ children from underfunded preschools while delivering essential school supplies.

SKILLS & INTERESTS

Hardware: PCB & circuit design (Altium, Eagle), breadboard/perfboard, SMD hot-air soldering (0402; 0.5mm pitch), MCU

(Teensy, STM32, Raspberry Pi), oscilloscope & logic analyzer, RF, CAD (Fusion360), LTspice, PCB bring-up, integration

Software: C/C++, Python, Java; STM32 firmware (HAL: I2C/SPI/DMA/timers/PWM/ADC), ROS2, Linux, OS, Git

Additional Memberships: Theta Tau Professional Engineering Fraternity, Amateur Radio Club, Vanderbilt Tech Crew

Interests: FC Barcelona, Formula 1, LEGO, Climbing Mt. Cayambe, Rockets, FIFA, Steak Enthusiast, Fitness, Trumpet