

John R. Mitchell IV

jmittchell350@gatech.edu | www.john4.net | US Citizen

Education

Georgia Institute of Technology | Atlanta, GA

Bachelor of Science in Electrical Engineering, GPA 4.0
Concentrations: Circuit Technology, Signal Processing & AI

Fall 2022 – Present
Expected Graduation: Fall 2025

Georgia Gwinnett College | Lawrenceville, GA

Transfer student

Fall 2019 – Spring 2022

Skills

Electrical Tools: Common benchtop tools, Spectrum Analyzer, Network Analyzer, FieldFox Analyzer, Fine-pitch SMD soldering

Shop Tools: Woodworking power tools, Metalworking tools, Machine tools, FDM and SLA 3D printers

Hardware: STM32, TI TIVA, ESP32, AVR MCUs, CAN-FD, Ethernet, Niche audio ICs, X-Microwave, Minicircuits

Software: Kicad, LTSpice, STM32 HAL, ESP-IDF, Arduino, Bash, git, Linux, Fusion 360, Blender, Adobe Photoshop, Illustrator

Languages: Python, MATLAB, Embedded C, C++, VHDL, HTML/CSS

Experience / Activities

Georgia Tech Research Institute (GTRI) | Sensors and Electromagnetic Applications Laboratory (SEAL)

Summer 2023

RF Systems Engineering Intern

- Wrote analysis scripts for RF phased array direction finding system to determine incident wave angle precision and accuracy.
- Contributed to the system design of an IRAD project, drawing schematics and working with technicians during assembly.
- Worked with X-Microwave and Minicircuits modules to build RF systems.
- Antenna and RF amplifier measurement with FieldFox and further analysis with custom MATLAB scripts.

Georgia Tech Solar Racing

Fall 2022 – Present

Electrical Team Member, Former Auxiliary Systems / Telemetry Team Lead

- Lead team and mentored recruits on Aux and Telemetry projects, taught PCB assembly/soldering fine packages down to 0.5mm QFN, circuit design, and programming TI Tiva and ESP32 microcontrollers.
- Developing hardware/software for high bandwidth network using CAN-FD for fast polling sensors throughout the car.
- PCB layout and design in Kicad: GPIO for driver input; Sensor for positional and movement data; Telemetry for GPS, LTE, RF communications; Battery Management System; Battery current sensing and more.
- Circuit design problem solving for: Low power LED headlights, battery pack current sense differential amplifier, I2C level shifting, High/Low voltage isolation, improving general signal integrity, ESD input protection, and EMI mitigation and more.

The Hive Makerspace | Georgia Tech

Spring 2023 – Spring 2024

Peer Instructor

- Provided guidance on soldering, circuit design, embedded systems, 3d printing, laser cutting, and machine shop use.

Undergraduate Research | Georgia Gwinnett College (GGC)

Spring 2022

Student Researcher

Individual research investigating novel method of improving surface quality of MSLA 3D printers.

- Conducted interdisciplinary project with Information Technology and Chemistry departments.
- Developed multiple algorithms and custom slicer software to apply z-axis dithering to randomize layer-line error.
- Wrote proposal for purchasing MSLA 3D printer for school and maintained printer in chemistry research lab setting.

Projects

ECE Senior Design – Wireless Motion-Powered Vibration Sensor for Wind Turbines

Fall 2024 – Present

- RF communications lead, and supporting IMU data capture and processing
- Determining the most power-efficient method for wirelessly transmitting high polling rate IMU data over 30 meters
- Targeting less than ~5mW average power consumption for the device

Modular Synthesizer

2021 – Present

Building a modular music synthesizer from scratch.

- Custom digital XY wave table oscillator with 1 Volt/Octave input accurate to 2 cents over 8 octaves using AVR microcontroller.
- Custom all analog Low Frequency Oscillator (LFO), Voltage Controlled Amplifier (VCA), and Voltage Controlled Filter (VCF).
- Custom real-time 2nd order “Mass-Damper-Spring” simulation envelope generator module using STM32 microcontroller.
- Designed to Eurorack specifications, introducing limitations on physical size, maximum power, and control voltages.
- Further details and photographs of the project can be found on my website: john4.net/projects

Relevant Coursework (Condensed)

Completed Courses: Analog Electronics, Electromagnetics, Microelectronic Circuits, Signals and Systems

Current Courses (Spring 2025): Analog VLSI I – from Theory to Tapeout, Wireless Communications, Senior Design II