

# John R. Mitchell IV

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## Education

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**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

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

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

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

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

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

## Experience / Activities

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**Georgia Tech Research Institute (GTRI) | Sensors and Electromagnetic Applications Laboratory (SEAL)**  
*RF Systems Engineering Intern*

Summer 2023

- Wrote analysis scripts for RF phased array direction finding system.
- Contributed to the system design of an IRAD project.
- Worked with X-Microwave and Minicircuits modules to build RF systems.
- Antenna 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*

- Mentored recruits on PCB assembly/soldering fine packages down to 0.5mm QFN, and programming TI Tiva and ESP32.
- PCB layout and design for low-voltage boards 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: LED headlights, battery pack current sense differential amplifier, I2C level shifting, general ESD input protection and EMI mitigation.

**The Hive Makerspace | Georgia Tech**

Spring 2023-Present

*Peer Instructor*

- Assists visitors to learn about electrical engineering and helps with building their projects.
- Provides guidance on soldering, circuit design, embedded systems, 3d printing, laser cutting, and machine shop use to visitors with varying skill levels.

**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.

**Sonic Doodle | Lilburn, GA**

2017 – 2022

*Founder / Designer*

*Custom built boutique guitars and effects pedals*

- Designed boutique guitar and bass effects pedals. Analog distortions, wave shapers, and phasors; digital delays and chorus.
- Repaired and provided maintenance for guitar and bass pedals and amps. (Mechanical hardware, electronics, woodworking)

## Projects

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**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 2<sup>nd</sup> 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](http://john4.net/projects)

## Relevant Coursework (Condensed)

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*Completed Courses:* Electromagnetics, Microelectronic Circuits, Intro to Digital Signal Processing

*Upcoming Courses (Fall 2024):* Antenna Design, Electromagnetics and Microwave Applications, Fundamentals of Machine Learning, Analog Electronics