John R. Mitchell IV

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Education

Georgia Institute of Technology | Atlanta, GA   *Fall 2022 – Present*
Bachelor of Science in Electrical Engineering, GPA 4.0   Expected Graduation, Fall 2024
Threads: Circuit Technology, Signal & Information Processing

Georgia Gwinnett College | Lawrenceville, GA   *Fall 2019 – Spring 2022*
Transfer with 78 Credit Hours

Skills

Electrical Tools: Electrical equipment and tools, through-hole / SMD soldering, Oscilloscope, Spectrum Analyzer, FieldFox Analyzer
Shop Tools: Woodworking power tools, Metalworking tools, Grinders, Machine tools, FDM and SLA 3d printers
Hardware: ATMega, ESP32, TI TIVA, STM32 MCUs; Discrete transistor analog circuits, Niche audio ICs, X-Microwave, Minicircuits
Software: Kicad, git, ESP-IDF, Arduino, Bash, tmux, Ultimaker Cura, Fusion 360, Blender, Adobe Photoshop, Adobe 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.
- Contributed to the system design of an IRAD project.
- Antenna measurement and analysis in MATLAB.

Georgia Tech Solar Racing   *Fall 2022-Present*
Auxiliary Systems, Former Auxiliary Systems Team Lead
- Lead auxiliary systems sub-team and mentored recruits on PCB assembly/soldering, and firmware.
- PCB layout for low-voltage boards: GPIO for driver input; Sensor for positional and movement data; Telemetry for GPS, LTE, RF communications; Battery Management System.
- 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.
- Customers' needs defined then circuits were designed to meet their requirements.
- Repaired and provided maintenance for guitar and bass pedals and amps. (Mechanical hardware, electronics, woodworking)

Projects

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.
- Custom all analog Low Frequency Oscillator (LFO), Voltage Controlled Amplifier (VCA), and Voltage Controlled Filter (VCF).
- 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 on top of resume.

Relevant Coursework

Completed: Circuit Analysis | Digital System Design *(Switch and gate design, Boolean algebra, State Machines)* | Intro to DSP
    Engineering Software Design *(C++)* | Digital Design Lab *(Design and implementation of complex digital systems)*
Current: Microelectronic Circuits | Measurements, Circuits and Microelectronics Laboratory | Electromagnetics | DSP Fundamentals