John Julian Martinez

jjm469@cornell.edu | (516) 724-6109 | www.linkedin.com/in/johnny-martinez469 | https://jjm469.github.io

EDUCATION

Cornell University, NY **Expected Graduation Spring 2025**

- **Anticipated Dual Major:** Electrical and Computer Engineering | Computer Science
- **Courses:** Digital Logic and Computer Organization, Object-Oriented Programming and Data Structures, Physics II: Electromagnetism, Introduction to Circuits for Electrical and Computer Engineers, The Computing Technology Inside Your Smartphone, Introduction to Computing Using Python, Differential Equations, Embedded Systems, Linear Algebra, Physics: III-Oscillation, Waves & Quantum Physics, Introduction to Probability.

ENGINEERING EXPERIENCE / PROJECTS

Shortest Path Optimization **December 2022**

- Implemented Dijkstra's shortest path algorithm on a cave mining game.
- Optimized miner's pathing by accounting for factors like how much gold was on the next tile, and said tile's proximity to neighboring tiles with gold.

Active Bandpass Filter Circuit with Integrated Microphone **December 2022**

- Used a combination of custom designed active bandpass filters and microphone to light up an LED array.
- Circuit configured to power a specific LED depending on the frequency of sound detected by the microphone.

Enhanced AI using Transposition Table **November 2022**

- Created a Transposition Table for an AI using a hashmap in order to improve its performance playing Pente.
- Implemented all Pente logic such as removing pieces from the board, keeping track of the score, etc in Java.
- A hashmap implementation of the table was desirable due to the data structure's constant lookup time.

Cornell Aerial Robotics | ECE Subteam **October 2022-Present**

- Design a fully autonomous drone to compete in the International Aerial Robotics Competition.
- Implement functionality on the drone using a Raspberry Pi running Ubuntu and Arduino microcontrollers.
- Currently designing a kill switch for the drone utilizing two N-type MOSFET transistors.

BigRed//Hacks Environmental Sustainability Hackathon **October 2022**

- Created an app that calculates the total power a user saves by doing specific actions.
- Used Kivy framework to create a custom GUI and UI.

Vacuum Tube Guitar Amp **October 2022**

- Currently creating a 2W guitar amp using vacuum tubes and other electrical components.
- Implementation utilizes capacitors and diodes to rectify AC current to DC.

FPGA Single Cycle Processor **April 2022**

- Designed a single-cycle processor from scratch on an FPGA board (excluding register and RAM).
- Implemented Instruction set (15 total instructions), Decoder, ALU, and PC Increment/Select/Halt logic modules.
- Utilized Altera ModelSim to debug and test processor by examining outputted binary values and waveforms.

RFID Raspberry Pi Reader/Writer **April 2022**

- Constructed a computer capable of reading and writing RFID cards/fobs.
- Implemented hardware allowing compatibility with 125 kHz and 13.56 MHz cards.

FPGA Reaction Time Game **March 2022**

- Built a reaction time game on a field-programmable gate array.
- Implemented logic with a 6-input, 15-state FSM.

LEADERSHIP EXPERIENCE

Society for Hispanic Professional Engineers | Corporate Board **April 2022 - Present**

- Communicate directly with company representatives to organize events and manage partnerships.

Institute of Electrical and Electronics Engineers (IEEE) | Corporate Director **February 2022 - Present**

- Plan workshops for resume review, interview prep, etc.
- Organize events such as Professor v. Student Trivia, company information sessions, and ECE Formal.

RELEVANT SKILLS

- Proficient in Java, Python, C, HTML, CSS, and Verilog.
- Confident using LTspice, Quartus, Altera Modelsim, Oscilloscopes, SMUs, and other technologies/programs.
- Experience with Kali Linux, Raspbian (Debian Linux), and VirtualBox.
- Familiarity with processor design & architecture as well as circuit design.
- Experience with GUI design in both Java and Python using Kivy and Swing.