Mahmoud Elsharawy

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EDUCATION

Cornell University Expected 05/2025
Master of Engineering in Electrical and Computer Engineering

Cornell University Expected 12/2024
B.S. in Computer Science, B.S. in Electrical and Computer Engineering GPA: 3.80

Relevant Coursework

Operating Systems	Analysis of Algorithms	Digital System Design Using Microcontrollers
Computer Architecture	Machine Learning	Foundations of Robotics

Skills

Programming Languages: Rust, Java, Bash, Python, C/C++
Software: Linux, LTspice, Cadence, KiCAD, Altium, Mentor Designer/Layout, Quartus
Hardware: Raspberry Pi, Arduino, FPGA Boards, Verilog

EXPERIENCE

Apple | *System Electrical Engineering Intern* Jan 2023 - Aug 2023

- Designed and tested a buck converter power module for use on internal dev boards, removing reliance on a vendor's power modules, preventing future supply chain issues and reducing cost
- Designed a PCBA to calibrate the ADC of a SAMD21 microcontroller, and programmed it using C to act as a micro-current load to precisely characterize power components
- Created prototype analog and RF circuits for future development
- Coordinated with a Product Design Engineer, DFM, and PCB Designer to design flexible PCBAs for prototypes

SpaceX | *Hardware Engineering Intern* Jan 2023 - Aug 2023

- Anchored User Terminal Power Budget over temperature and operating mode by automating thermal chamber data collection through SCPI commands, informing thermal team of shortcomings and improving field predictions
- Automated an assembly line station through mechanical design and PLC TwinCAT software, tripling its speed and preventing a production bottleneck
- Tested and qualified alternative integrated circuits for Business User Terminals, preventing a parts shortage
- Designed a dev PCBA to test various potential fixes for acoustic noise from user terminals

Cornell University Unmanned Air Systems | *Electrical Team Member* Aug 2022 - Dec 2022

- Designed a PCB using an ESP32-S2 microcontroller programmed in C to interface with a camera over a DVP or USB protocol and save footage to an SD card

PROJECTS

Chess AI Aug 2021 - Jun 2022

- Developed a UCI Chess AI from scratch in Rust using a minimax algorithm with variable depth and time control
- Hosted a systemd service to interact with lichess.com's API, allowing the AI to play against other bots and humans, earning an Elo rating of 1700, making it stronger than 70% of human players on the website

Servo Controller Aug 2021 - Jun 2022

- Modified servos to provide an analog feedback signal of their position by accessing the potentiometer within it
- Designed and created an Op-Amp circuit which generates a pulse width modulation (PWM) signal, controlling the position of a servo to match that of another servo by implementing an analog feedback loop to adjust the signal

Automatic Plant Waterer Aug 2021 - Jun 2022

- Designed, programmed and built an Arduino-controlled 3D-Printed automatic plant watering machine with C, housing a mint plant and a water supply
- Implemented an Arduino to detect when the soil is too dry and use a peristaltic pump to water the plant when necessary