Mahmoud Elsharawy

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EDUCATION

Cornell University Expected 05/2025
Master of Engineering in Computer Science

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

Relevant Coursework

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

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* May 2023 - Aug 2023
- Developed a software tool to automate HSPICE simulations for existing Cadence designs and GPIO specifications, using Python and shell scripts
- Designed a battery charging circuit and USB/SPI communication for a prototype
- Created prototype analog and RF circuits for testing and future development

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 testing and future development
- Coordinated with a Product Design Engineer, DFM, and PCB Designer to design flexible PCBAs for prototypes

SpaceX | *Hardware Engineering Intern* Jan 2022 - Aug 2022
- 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

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 1850, making it stronger than 85% 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