Mahmoud Elsharawy

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EDUCATION

Cornell University **Ithaca, NY**
B.S. in Electrical and Computer Engineering, B.S. in Computer Science (GPA - 3.9) *Expected Graduation: May 2024*

Relevant Coursework

Optimal System Analysis & Design
Introduction to Analysis of Algorithms
Data Structures & Functional Programming
Digital System Design Using Microcontrollers

Skills

Programming Languages: Java, Python, Rust, C/C++, OCaml

Software: Linux, LTspice, KiCAD, Mentor Designer/Layout, Quartus, SolidWorks, Fusion 360

Hardware: Raspberry Pi, Arduino, FPGA Boards, Verilog

EXPERIENCE

SpaceX **Hawthorne, CA**
Starlink Engineering Intern *Jan 2021 - Aug 2021*

- Designed a dev PCBA to test various potential fixes for acoustic noise from user terminals
- 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
- Tested and qualified alternative integrated circuits for Business User Terminals, preventing a parts shortage
- Automated an assembly line station through mechanical design and PLC TwinCAT software, tripling its speed and preventing a production bottleneck

Autonomous Underwater Vehicle **Ithaca, NY**
Project Team Member *Fall 2020 - Fall 2021*

- Created and implemented an algorithm for Active Ballast Control in Python to assist in maintaining pitch and roll
- Designed a Kill-Switch circuit board with KiCAD, improving upon previous designs by allowing reversibility and reducing size
- Designed a Kill-Switch enclosure and mechanism with SolidWorks, improving upon previous designs by reducing size and weight
- Presented and analyzed design choices in bi-weekly design reviews and written technical documentation

Cornell University - Engineering Learning Initiatives **Ithaca, NY**
Tutor - Statics and Mechanics of Solids & Multivariable Calculus *Fall 2021*

- Met with students in one-on-one sessions, assisting their understanding of course material, and promoting their development of critical thinking and problem solving skills

Cornell University - Statics and Mechanics of Solids **Ithaca, NY**
Teaching Assistant *Spring 2021*

- Hosted two lectures, preparing over 70 students for upcoming exams by solving practice problems with them
- Led weekly office hours for 3-5 students, assisting them in understanding concepts and applications taught in lectures

PROJECTS

Chess AI *Summer 2021*

- Developed a UCI Chess AI from scratch in Rust using a minimax algorithm with variable depth and time control.
- Set up interaction with lichess.com's API, allowing the AI to play against other bots and humans, earning an Elo rating of 1600, making it stronger than most human players on the website.

Servo Controller *Summer 2021*

- 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 *Summer 2020*

- Designed and built 3D-Printed automatic plant watering machine with Fusion 360, 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

3D Printed RC Hovercraft *Fall 2019*

- Designed and built a fully 3D-Printed radio controlled (RC) Hovercraft with Fusion 360, using custom-designed 3D-Printed impellers.