Mahmoud Elsharawy

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EDUCATION

Cornell University **Ithaca, NY**

B.S. in Electrical and Computer Engineering, GPA - 3.92/4.0 *Expected Graduation: May 2024*

Relevant Coursework

Intelligent Physical Systems
Digital Logic & Computer Organization
Object-Oriented Programming & Data Structures
Mathematics of Signal and System Analysis

Skills

Programming Languages: Java, Python, C/C++, MATLAB

Manufacturing: Mill, Lathe, 3D Printing / Additive Manufacturing, Soldering

Software: KiCAD, Quartus, Linux, SolidWorks, Fusion 360, AutoCAD

Hardware: Oscilloscope, Arduino, FPGA Boards, Verilog

EXPERIENCE

Autonomous Underwater Vehicle **Ithaca, NY**

Project Team Member *January 2021 - Present*

- Designed algorithm for Active Ballast Control in Python to assist in maintaining pitch and roll
- Designed a Kill-Switch circuit board with KiCAD, which sends a signal to cut off power to the submarine's mechatronics when a magnetic field from the Kill-Switch is detected
- Designed a Kill-Switch enclosure and mechanism with SolidWorks, rotating a magnet when a lever is pulled

Cornell University - Engineering Learning Initiatives **Ithaca, NY**

Tutor - Statics and Mechanics of Solids & Multivariable Calculus *Fall 2021 - Present*

- Meet 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

Art of Problem Solving **Remote**

Teaching Assistant, Grader *July 2020 - July 2021*

- Answered questions during online classes, and mentored students in competition math and Python
- Graded students' work, providing specific helpful feedback to help them improve their coding abilities
- Assisted students through message boards, helping them understand math and coding concepts through their homework

PROJECTS

Chess AI *Summer 2021*

- Developed a Chess AI from scratch in Java 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.