Patrick Youssef

Robotics Graduate Student

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Experience

SpaceX — *Hawthorne, California*

Guidance, Navigation, & Control Software Intern — *Jun. 2019 - Aug. 2019*

- Overhauled flight configuration pipeline in Python to allow launch-to-land simulations that helped finalize crewed flight approval
- Refined vehicle constraint checking tools to reduce configuration edit time by nearly 10x using a YAML parser
- Developed Python scripts to generate multi-simulation statistics that provided engineers insight into vehicle performance

Ground Support Equipment Intern — *Mar. 2019 - Jun. 2019*

- Developed computer vision software in Python/C++ to automate patch testing saving hours of manual work
- Optimized control gains of large scale pressure and liquid nitrogen controllers to aid in safe testing of Crew Dragon
- Led the creation of a safety system to automatically restrict high-pressure supply air in the event of an anomaly

HyperXite - HyperLoop Competition Team — *Irvine, California*

Systems Engineering Lead — *May. 2018 - Mar. 2020*

- Managed top-level design decisions to optimize our timeline, budget, and performance for the SpaceX HyperLoop competition
- Developed a Python systems model of the pod's propulsion system to optimize component selection and design choices
- Conferred with the Dean of Engineering on improving the senior-design spaces and promote the project presence on campus

Matlab For Engineering Computation Course — *Irvine, California*

Undergraduate Teaching Assistant — *Sep. 2017 - Dec. 2019*

- Adjusted course curriculum to better reflect the needs of industry and immediate academic pursuits
- Held office hours twice a week to improve staff availability and answer questions in a group setting
- Developed problems for real-time class usage in pursuit of a more dynamic and engaging lecture

FIRST Robotics Team 3476 — *Irvine, California*

Technical Mentor - Systems Design — *Jun. 2017 - Mar. 2020*

- Guided systems design and interdisciplinary integration leading to the least modified robot in the team's history
- Developed, alongside the high schoolers, a computer vision system running on a Jetson TX1 to track goals and guide the robot

Research

UCI Rehabilitative Robotics Research Lab — *Irvine, California*

Undergraduate Researcher — *May. 2018 - Sep. 2018*

- Developed admittance/impedance controllers to emulate dynamic environments for Duchenne's rehabilitation research
- Collaborated with our post-doc, Joan Lobo-Prat, on the real-time implementation of the control system in Simulink Real Time
- Redesigned patient hand interface with embedded force sensors to reduce sensor noise 8x

Education

University of California, San Diego — *San Diego, California*

M.S. Electrical and Computer Engineering — *Sep. 2020 - Jun. 2022*

- Intelligent Systems, Robotics, and Control
- Cumulative GPA: 3.8

University of California, Irvine — *Irvine, California*

B.S. Mechanical Engineering — *Sep. 2016 - Mar. 2020*

- Engineering GPA: 3.6 & Cumulative GPA: 3.5
- 4x Dean's List Recipient

Skills

Languages & Tools Python - NumPy - Git - MATLAB - Linux - Bash - C++ - HTML/CSS/JavaScript - LaTeX

Applied Math Numerical Methods - Machine Learning - Monte Carlo Simulations - Control Theory

Interests

Machine Learning | Simulation | Autonomous Vehicles | Computer Vision | Spaceflight