Joy Fakhry, E.I.T.

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EDUCATION

Northeastern University, Boston, MA

Master of Science in **Robotics** | Mechanical Engineering Concentration GPA: **3.7** Relevant Coursework: Computer Aided Manufacturing, Factory System Design, Robot Mechanics and Control

University of California: Irvine, Irvine, CA

Bachelor of Science in **Mechanical Engineering** | Minor in Computer Science GPA: **3.7** Relevant Coursework: Robot Design, Control Systems, Finite Element Analysis, Manufacturing Processes

<u>SKILLS</u>

Engineering packages: SolidWorks (CSWP, CSWA, CSWA-AM), ANSYS CFX, ANSYS Mechanical Programming: Python, MATLAB, ROS Fabrication: Welding (MIG/TIG/gas), basic machining and hand tools, soldering Licensure: NCEES FE Mechanical Engineering Aviation: FAA Private Pilot License

EXPERIENCE

Amazon Robotics, Hardware Test Engineer

- Developed a portable IO-Link sensor monitoring and logging kit, enabling plug-and-play data acquisition from any IO-link sensor. Features a touchscreen monitor, IFM IO-link master, and various I/O ports, all in a small form factor
- Created a custom tote (plastic bin) test fixture that utilized a belt driven linear actuator and Nanotec motor to push and pull totes @1.5 m/s over various materials to test wear rate. Included redundant safety systems and custom GUI control interface written in Python.
- Performed motion capture testing on robotic mechanisms to determine sway characteristics of 2 meter tall rigid bodies. Testing involved scripting autonomous robot movements and data analysis of OptiTrack motion data.

Amazon Robotics, Hardware Engineer Co-op

- Utilized SolidWorks to model and create drawings for a test fixture made from aluminum extrusions with mobility and adjustability built in. Worked with a supplier to deliver parts on time, and personally hand-built said test fixture, allowing teammates to have a platform from which to build a "tote grabber".
- Designed prototype racking structures in SolidWorks for use in warehouse scale ASRS, and coordinated with third party vendors to manufacture and deliver the prototypes
- Created a resource tracking tool integrated directly into Slack which noticeably improved productivity and work

AeroNU and UCI Rocket Project, Propulsion Sub-team, Test Stand Engineer

- Used top-down modeling approach to design a modular vertical test stand for a 3500N thrust liquid bi-propellant rocket engine. Designed to withstand 3500N of thrust. Hand calculations were performed with Mathematica to determine static safety limits and corroborated with FEA analysis.
- Maintained collegiate liquid bi-propellant rocket test stand, performed repairs and upgrades, operated test stand during water flows, cold-flows and hot-fire testing
- Designed, plasma cut, and welded a blast shield that protected the test stand and bystanders during an engine failure
- Designed an original quick-disconnect system using SolidWorks for ground fueling, allowing fuel umbilical to be disconnected remotely via spring loaded quick disconnect fittings and remote-controlled linear actuators
- Simulated failure modes of tanks and quick-disconnects using ANSYS Mechanical to ensure safety and structural integrity up to aerospace industry standards
- Modeled stainless steel cryogenic tanks for liquid oxygen and liquid methane using SolidWorks by optimizing preexisting end caps and tank geometry to improve space efficiency. Performed structural, fluid, and temperature varying stress analyses to ensure functional safety during operations

May 2022 – Dec 2022

Sept 2019 – Dec 2023

March 2024 – Present

December 2023

June 2021