Matthew Morley

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Education

2020-Present **NORTHEASTERN UNIVERSITY** **BOSTON, MA**

Candidate for Bachelor of Science in Mechanical Engineering (Graduation May 2024)
National Fluid Power Association Robotics Challenge Scholarship Winner (2020)
GPA 3.87 / 4.0 – *Dean's List all semesters*

Skills

Languages: *C++, C, Python, Java, Flutter, Kotlin, MatLab*
Software: *Docker, ROS, KiCad, SOLIDWORKS, Git, Linux, Jira*
Fabrication: *Comfortable on mills (manual, CNC), lathes, 3D printers, hand/hot air soldering, hand tools*

Experience

Sep. 2023 - Present **SPACE EXPLORATION TECHNOLOGIES** **CAPE CANAVERAL, FL**

Engineering Intern, Falcon 9 Recovery Operations
Develop ROS-based automation for maritime robotic systems, decreasing operator workload in complex mission operations

May 2023 - Aug. 2023 **JET PROPULSION LABORATORY** **PACADENA, CA**

Summer Engineering Intern
Implemented robot hand-eye calibration for the Ocean World Lander Autonomy Testbed

- Developed kinematic calibration scripts using ROS and C++, improving accuracy by over 70%
- Researched and presented literature review on robot hand=eye calibration methods
- Designed 3D printed motion capture marker mounts for robot calibration in SOLIDWORKS

July 2022 - Dec. 2022 **GREENSIGHT AGRONOMICS** **BOSTON, MA**

Robotics & Engineering Intern
Performed new drone avionics bringup and debugging, designed PCBs, and wrote embedded software

- Gained FAA Part 107 remote pilot license and performed drone flight testing
- Characterized LiDAR and radar sensor performance for autonomous drone flight using ROS
- Developed robust SPI LoRa radio driver for drone swarm communication over MAVLink in C++

Oct. 2021 - July 2022, Dec. 2022 - May 2023 **JOHNSON & JOHNSON** **REDWOOD CITY, CA (REMOTE)**

Software Robotics and Controls Intern
Developed and refactored instrument simulation models for the Monarch surgical robot in C++ and Python

- Identified correlations in procedure data logs to accurately simulate surgical system behavior
- Created simulation models, enabled verification of procedure workflow and increased unit-test coverage

June 2021 - Sep. 2021 **JOHNSON & JOHNSON** **SANTA CLARA, CA**

Mechanical Engineering Intern
Designed, programmed, fabricated, and deployed actuator test fixtures for the Ottava surgical robot

- Enabled verification of robotic joints to safety-critical performance metrics on the manufacturing line
- Generated drawings in SOLIDWORKS with GD&T, interfaced with vendors to order machined parts

Leadership

Sep. 2020 - Present **AVIONICS LEAD, AEROSPACE NU** **BOSTON, MA**

As Avionics Lead, developed flight-critical embedded software and radio telemetry protocol for high-power rockets, launched test flights of custom avionics, and supported cold flow and hot fire tests of our liquid rocket engine. In a small team, designed and flew supersonic high-power rockets to over 15,000 feet to earn NAR Level 2 certification

June 2020 - Present **PROJECT LEAD, PHOTONVISION, FIRST ROBOTICS** **BOSTON, MA**

Lead team of 13 developers in creating vision tracking software solution for FIRST Robotics Competition, with over 10,000 downloads. Integrated fiducial pose reconstruction, camera calibration assistant, and CI workflows

Sep. 2020 - Sep. 2022 **AEROSPACE NU (AIAA) – AVIONICS LEAD & CHIEF SAFETY OFFICER** **BOSTON, MA**

Led design safety committee reviewing club model rockets, and worked with school to safely perform on-campus tests

Interests

Sailing, crochet, high-power model rocketry (Level 2), HAM technician (KM6GNL)