

Cormac O'Neill

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PROFESSIONAL EXPERIENCE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Cambridge, MA

Graduate Research Assistant, d'Arbeloff Laboratory

September 2019 - Present

- Developing autonomous cranes for use in heavy manufacturing industries
- Designing control schemes for Cable Suspended Parallel Robots (CSPRs) to allow for dexterous manipulation
- Collaborating with an industry partner to align ongoing research with current industry needs

SCHLUMBERGER

Rosharon, TX

Technology Intern, Rosharon Production Services

Summer 2018

- Selected and tested adhesives for new shaped-charge designs.
- Recommended design changes for shaped-charges to improve manufacturability
- Quantified cycle time for automated manufacturing facilities.

CALTECH MCE DEPARTMENT

Pasadena, CA

Teaching Assistant, Engineering Design Laboratory and Capstone Project (ME72) Summer 2018 – March 2019

- Gained valuable leadership and teaching experience.
- Made and gave lectures to Junior and Senior Engineering students.
- Developed an amphibious robotic competition for students' final project.

MATTEL

El Segundo, CA

Automation Engineering Intern, Global Product Development and Supply Chain

Summer 2017

- Implemented lean manufacturing techniques in automated cells.
- Identified top downtime and scrap root causes along with potential solutions.
- Quantified manufacturing efficiency using OEE metrics.
- Created purchasing plans with vendors for new capital investments.

LIGO, CALTECH

Pasadena, CA

Mechanical Engineering Team, LIGO

October 2016 – February 2018

- Experience with Finite Element Analysis software.
- Tested non-magnetic mass damper for test mass support structure.
- Investigated different epoxy resins for use in the vacuum conditions of LIGO.

SPACE STRUCTURES LABORATORY, CALTECH

Pasadena, CA

Summer Intern, Graduate Aerospace Laboratories at CIT

Summer 2016

- Aided with research and preparation for the AAReST mission (Autonomous Assembly of a Reconfigurable Space Telescope).
- Calibrated and characterized the deformable mirrors developed for AAReST.
- Performed characterizing measurements on composite springs, aiding with their design, for the Space Solar Power Initiative.

EDUCATION

CALIFORNIA INSTITUTE OF TECHNOLOGY

Pasadena, CA

BSc, Major in Mechanical Engineering (3.9/4.0) w/ Minor in Aerospace

Class of 2019

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Cambridge, MA

PhD and MS, Major in Mechanical Engineering with a focus in Robotics

2019 - Present

- Performing thesis research in the d'Arbeloff Lab as a Research Assistant
- Developing automated cranes for manipulation tasks in heavy industries

PROJECTS & AWARDS

Lester Lees Aeronautics Fellow

Recipient of Named Scholarship for Summer Research

- Awarded to a student participating in aeronautics research at Caltech.
- Received for my work in the Space Structures Laboratory.

Caltech Robotics Team 2015 - 2019

Mechanical Lead, First Place RoboSub 2016

- In charge of the overall mechanical design of the vehicle while collaborating with electrical and programming sub teams.
- Acted as project manager for all the teams working on the mechanical subsystems for the vehicle.
- Developed and fabricated a high-pressure pneumatic system and electronics-mounting package for the robot.
- Gained experience in design, machining, testing and failure analysis.

MIT NASA Big Idea Challenge 2020

Multifunctional Expandable Lunar Lightweight Tall Tower (MELLTT), Path to Flight Award

- Developed electrical and power subsystems for a deployable composite boom for a NASA proposal
- Worked on testing and integration plans for the full concept
- Funded by NASA for an Earth-based demonstration
- Co-wrote a proceedings report on Economically Viable Lunar Settlements for the American Institute of Aeronautics and Astronautics

CMU Space Innovation Challenge 2019 - 2020

Graduate-level Case Competition for Commercial Space Concepts

- Gained experience on developing business cases for commercial space ventures while leveraging my technical knowledge
- Presented a roadmap for the use of a lunar mass driver to enable profitable fuel exports from the Moon
- Developed a concept for the use of inflatable spacecraft as mechanism for affordable trash disposal from LEO space stations

PUBLICATIONS

- C. O'Neill and H. H. Asada, "Safe Tumbling of Heavy Objects Using a Two-Cable Crane," in *IEEE Robotics and Automation Letters*, vol. 6, no. 2, pp. 1082-1089, April 2021, doi: 10.1109/LRA.2021.3056029.
- Todd, Jessica & Lordos, George & Browder, Becca & Martell, Benjamin & O'Neill, Cormac. (2020). Ensuring Economically Viable Lunar Settlements: *ASCENDxCo-Lab Proceedings Report*.
- George C. Lordos, et al. "Autonomously Deployable Tower Infrastructure for Exploration and Communication in Lunar Permanently Shadowed Regions," AIAA 2020-4109. *ASCEND 2020*. November 2020.

ADDITIONAL SKILLS

- Experience in Python, Matlab, C, SolidWorks and ANSYS.
- Experience machining parts using manual and CNC equipment, as well as using additive manufacturing.