

Paul Nadan

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Robotics and Space Exploration

EDUCATION

Ph.D. ROBOTICS, Carnegie Mellon University

Incoming Aug 2020

B.S. MECHANICAL ENGINEERING, Olin College of Engineering

May 2020

EXPERIENCE

RESEARCH ASSISTANT, Robomechanics Lab, Carnegie Mellon University

Jun 2020 – Present

- Working with Professor Aaron Johnson to develop robotic climbing capabilities for planetary rovers

STUDENT RESEARCHER, Olin Robotics Lab, Olin College of Engineering

Sep 2018 – Mar 2020

- Developed a six-legged robotic hexapod as an all-terrain exploratory rover for space missions
- Implemented algorithms to traverse rough terrain, ascend steep slopes, and autonomously navigate around obstacles
- Designed and fabricated robotic actuators and custom mounts for sensors and electronics

CO-CAPTAIN, Olin Aerial Robotics Team

Sep 2017 – Mar 2020

- Launched a new student team at Olin College to enter the International Aerial Robotics Competition (IARC)
- Competed to solve open research problems like GPS-denied navigation, swarm coordination, and human-robot interaction
- Designed control system architecture and wrote code for localization, machine vision, voice control, and obstacle avoidance
- Competed in the 2019 IARC Competition, where we demonstrated our system and received the award for Best Presentation

COURSE ASSISTANT, Olin College of Engineering

Jan 2018 – May 2020

- Courses included Engineering Systems Analysis (S '20), Transport Phenomena (F '19), Partial Differential Equations (S '19), and Quantitative Engineering Analysis I & II (S & F '18)
- Assisted with class instruction, held office hours, checked in on students' progress, and provided feedback on their work

INTERN, NASA Jet Propulsion Laboratory

Summer 2018 & 2019

- Led the mechanical design and fabrication of a novel folding hexacopter capable of ballistic deployment from a launch tube
- Overcame challenges including extreme launch loads, tight space constraints, vibration mitigation, and electrical integration
- Machined carbon fiber components, selected flight hardware, and wired up electronics to build a fully functional prototype
- Diagnosed problems and identified potential design improvements through rapid prototyping and field testing
- Designed and tested mechanisms for the predecessor, a ballistically launched quadcopter, during the preceding summer
- Results documented in conference paper submissions to IEEE IROS 2019 and ICRA 2020 and highlighted by IEEE Spectrum, The Verge, and Engadget

STUDENT RESEARCHER, Chris Lee's Research Group, Olin College of Engineering

Sep 2017 - May 2019

- Analyzed a bird-inspired perching landing gear system that allows drones to land on branches and rough terrain features
- Developed a hybrid empirical-numerical computational model of grasping forces and kinematics
- Conducted MATLAB simulations to optimize design parameters for future iterations of the landing gear mechanism
- Presented results at the ASME IMECE 2018 conference and published in the ASME Journal of Mechanisms and Robotics

CO-FOUNDER, Fishbox Games LLC

Oct 2016 – Feb 2018

- Co-developed *Project Airlock*, an innovative, space-themed social deduction board game
- Founded the company Fishbox Games LLC and launched a successful Kickstarter crowdfunding campaign raising over \$9,000
- Successfully coordinated manufacturing and shipping of games to backers

ENGINEERING INTERN, Eastman Chemical Company

Summer 2016 & 2017

- Assisted effort to scale up new functional film manufacturing technologies for mass production
- Designed test equipment, operated prototype machines, and analyzed testing results to improve the manufacturing process
- Prepared chemical solutions and performed experiments to optimize film optical properties

SKILLS

- **Programming:** Java, Python, C++, MATLAB, Mathematica, ROS, and Arduino
- **Fabrication:** CNC mill, lathe, band saw, drill press, 3D printer, laser cutter, and soldering
- **Computer-Aided Design and Finite Element Analysis:** SolidWorks, Fusion 360, OnShape, ANSYS, and COMSOL