Paul Nadan

paulnadan.com
pnadan@cmu.edu

Robotics and Space Exploration

EDUCATION

Ph.D. ROBOTICS, Carnegie Mellon University *Aug 2020 - Present*

B.S. MECHANICAL ENGINEERING, Olin College of Engineering *Sep 2016 - May 2020*

EXPERIENCE

GRADUATE RESEARCH ASSISTANT, Robomechanics Lab, Carnegie Mellon University *Jun 2020 – Present*

- Working with Professor Aaron Johnson to develop robotic climbing capabilities for planetary rovers
- Supported by the NASA Space Technology Graduate Research Opportunities fellowship

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 research problems including 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 were presented at IEEE IROS 2019, and ICRA 2020 (received Best Paper Award on Unmanned Aerial Vehicles)

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 ASME IMECE 2018 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