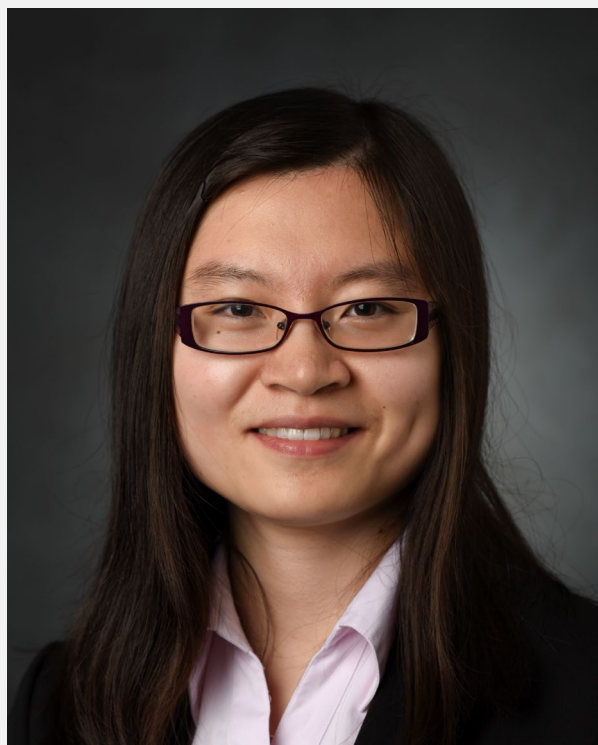




# Interacting with the Environment for Autonomous Aerial Manipulation



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## **ABSTRACT**

Today there are many tasks at high altitude that are still manually performed, which are expensive, inefficient, and hazardous to human life. The rapid growth of autonomous Uncrewed Aerial Vehicles (UAVs) has the potential to provide a safer and more efficient solution. Although the use of UAVs has grown rapidly, most of today's vehicles still focus on passive tasks like inspection, surveillance, monitoring, remote sensing, etc. Aerial manipulation is intended to perform manipulation tasks, such as grasping, transporting, positioning, assembly, and disassembly of mechanical parts, etc., which can assist humans in performing tasks at high altitudes, or in hazardous situations. Aerial manipulation tasks require the robot interact with the environment: perceive the environment, then perform the manipulation. When interacting with the environment, the key challenges are how to extract the useful information efficiently from the environment and better serve for the accurate control. This talk will address these challenges for several manipulation tasks, including cooperative slung load transportation by multiple aerial robots, aerial bridge painting, general robotic manipulation, etc.

## **BIOGRAPHY**

Dr. Junyi (Jenny) Geng is an Assistant Professor with Department of Aerospace Engineering at Pennsylvania State University. She was a Postdoc Fellow with the Robotics Institute at Carnegie Mellon University, where she was a member of AirLab working on aerial manipulation and eVTOL. Before that, she was a Postdoctoral Research Associate of Coordinated Science Lab at University of Illinois Urbana-Champaign working on robotic manipulation for high precision assembly. She received her Ph.D. and M.S. in Aerospace Engineering with a minor in Electrical Engineering from Pennsylvania State University, and holds her B.S. degree in Aircraft Design and Engineering from Nanjing University of Aeronautics and Astronautics. She is enthusiastic about robotics and unmanned aerial system (UAS). She is also interested in computer vision, optimization and machine learning.