

# D.U.N.G.

(DEVICE UPLIFTING AND NAVIGATION GROUP)

## TEAM 183

### TEAM MEMBERS

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### OVERVIEW

A swarm robotic system designed to maneuver planes around an airport.

### THE PROBLEM

Moving planes around hangars is a delicate and time-consuming task, especially when the desired aircraft is stored at the back. Such aircraft are expensive, and a collision could cost both owners several thousands of dollars. In addition, many members of the aviation community are unable to maneuver these vehicles without assistance, which presents a new barrier to entry for a pastime that is already wrought with impediments for newcomers.

### THE REQUIREMENTS

This project aims to develop a collaborative swarm robotic system. This involves the construction of 3 robots that can move a model plane around a 2D airport. It also involves implementing software that calculates the pathing of each robot and navigates them to their destination, align themselves, and lift the desired object. Finally, this project requires a user interface allowing clients to interact intuitively with the system.

### THE SOLUTION

Project DUNG employed a bottom-up approach, with subsystems developed independently and integrated later. Half the team focused on fabricating the robots' physical structures using CNC Milling, Laser Cutting, and 3D Printing, while the other half dedicated their efforts to software and control development. This collaborative process exemplified innovation and precision, culminating in a highly efficient product development system.

### THE RESULTS

The team developed a trio of robots that operate together successfully, achieving the project's objectives with precision. Tackling such a complex system honed the team's skills and fostered invaluable expertise. The mechanisms functioned as intended, highlighting collaboration and ingenuity. This milestone serves not only as a testament to the team's dedication but also as a solid foundation for future ambitious projects.

