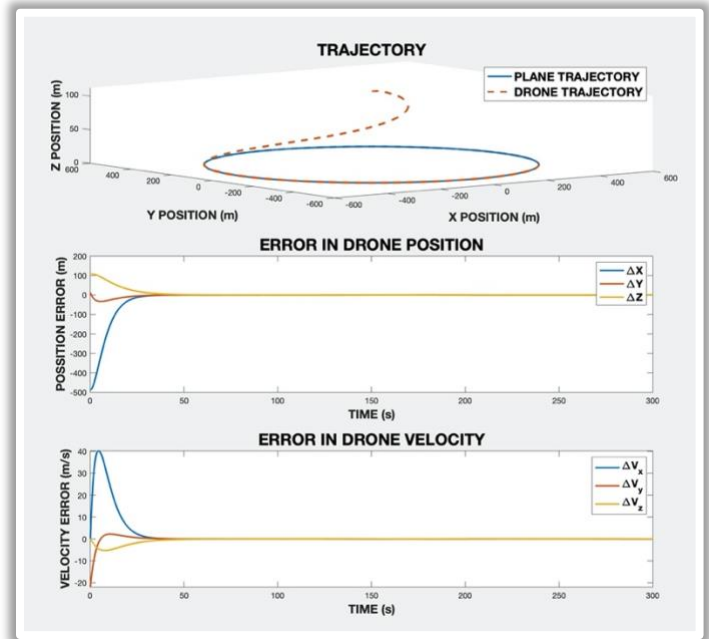


# Engineering Portfolio: Michael Levy

## UAV Landing on Loitering Aircraft

Developed navigation and guidance system for small UAV to land on a fixed wing loitering aircraft. Only information available was the time history measurements of the loitering aircraft which was corrupted by zero mean gaussian noise. Designed (continuous time) Kalman filter as well as a controller using estimates from navigation system. Shown at right is the trajectory of the drone and aircraft as well as error plots that show the drone converges to the trajectory of the plane.



## ESRA 30K Rocket

Designed and built a 6.25" diameter, 12' long solid motor amateur rocket. Led development and built recovery systems for rocket. Manufactured the parachutes, designed the ejection charges, conducted all tests and simulations. Designed and implemented configuration of the rocket, managing inputs from all sub teams. Ran day-of flight simulations, integrated recovery systems, and led day-of recovery effort.

## Halo Holds

Designed and built smart rock-climbing wall in my garage with three other friends. Led team from ideation to implementation of rock-climbing wall. Specifically developed rock climbing holds that were translucent and lit up with RGB LEDs. Also developed pitch deck and presented at startup competitions where team won innovation entrepreneurship awards. Investigated IP landscape of underlying technology for viability of commercialization.



# Engineering Portfolio: Michael Levy

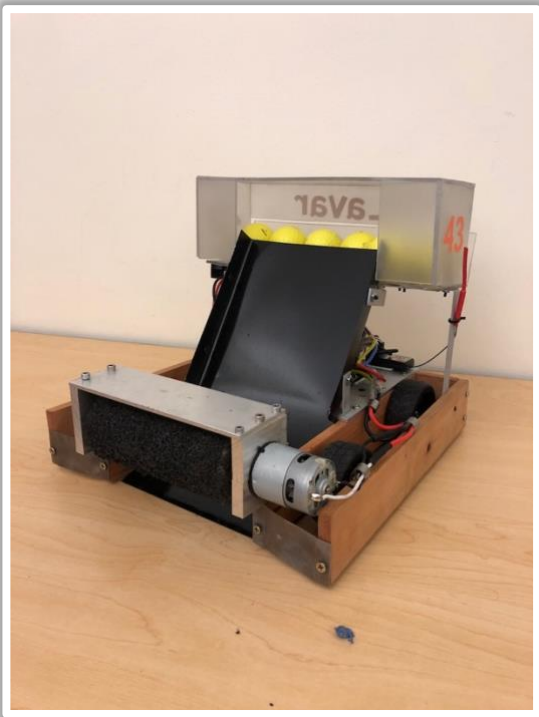
## Maze Robot

Designed autonomous maze-solving robot with a team of three other engineers. Wrote PID controller as well as logic to navigate an unknown maze. Kept design very simple and did not over complicate logic. With simple design, team won out of 25+ competitor teams for fastest maze-solve on two separate challenge mazes.



## Battle Bot

Built robot for Hungry Hungry Hippos Battle Bots competition. Designed electronics system as well as led the team. Robot performed exceptionally and ended up 5<sup>th</sup> out of 25 teams. Our method for gathering golf balls was innovative, elegant and a very efficient implementation which contributed to the robot's success.



## Competitive Sailing

Sailing is what has driven my passion for robotics, engineering, and space exploration. I have been sailing since I was 10 years old. As no one in my family knew how to sail, I was fully responsible for taking care of my small sailboat, transporting, budgeting, and applying for grants to support my campaign. In the image right, I am training at an Olympic development camp. Seamanship is incredibly important when sailing and has significant parallels to engineering.

