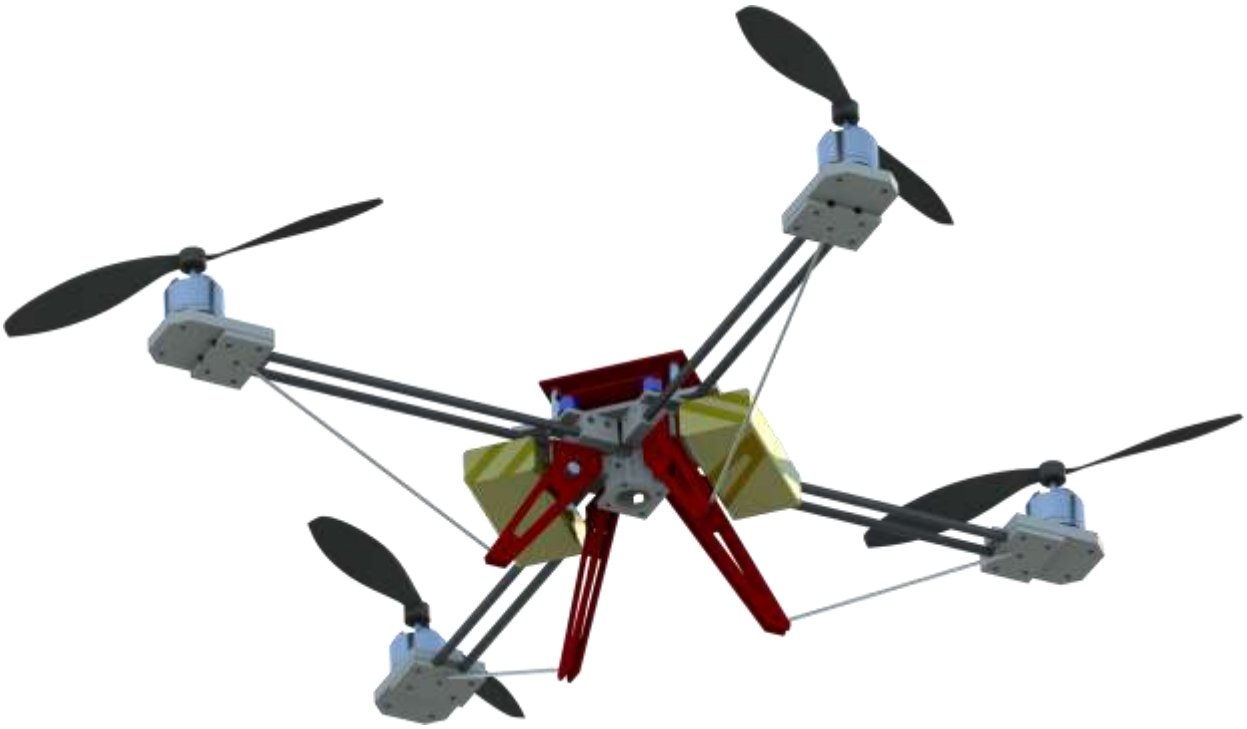
Quadcopter Project

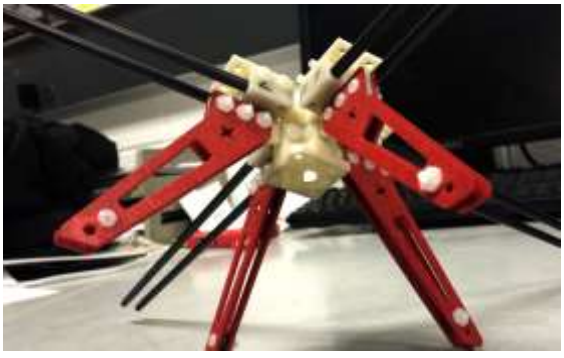
May 2014 - Present

I have designed a lightweight and capable four-rotor aircraft for aerial photography.

- Uses a novel truss structure that greatly reduces weight
- Diverse materials selection, including various polymers, carbon fiber, and fiberglass
- Strong attention to protecting flight sensors against vibration
- Low center of gravity to provide stable filming platform



A SolidWorks render showing the carbon fiber arms and truss structure



Photos of the prototype under construction

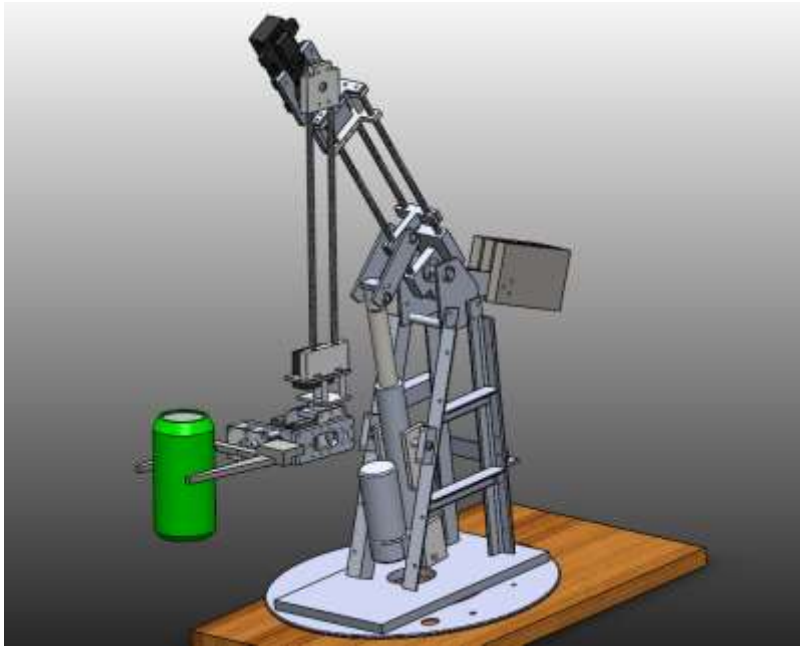
Robot Arm

January 2015 - Present

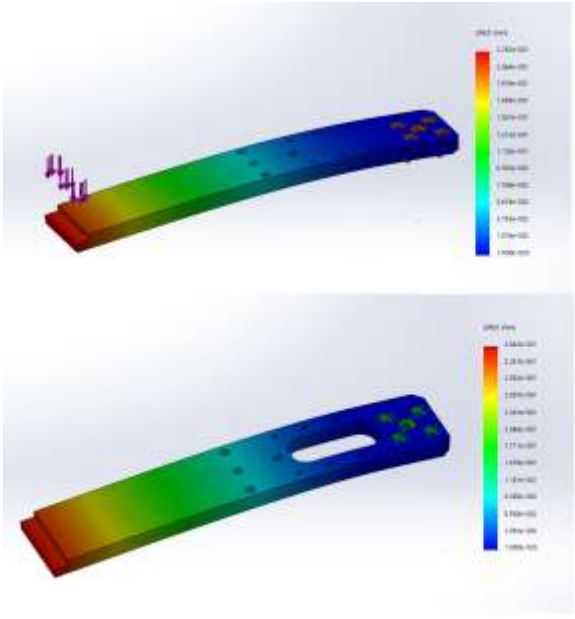
Working with a colleague, Ethan Glassman, we have designed a 6-degree of freedom robotic arm and are working to manufacture it.

- Designed for a payload of 1lb. and a reach of 2ft.
- We specified the actuators by weighing price, power, ease of interface, and factor of safety.
- Entire robot is able to move with full closed-loop control.
- This project was funded in part by a grant from our student chapter of ASME. We hope to build this project as a software experimentation platform for future engineering students.

A render of the robot arm assembly during the design process



The robot has gone through many major design revisions, continuously incorporating new improvements.



We compared several different design features using SolidWorks FEA.

Senior Design Project

September – December 2014

My team and I worked to construct a two-axis motorized solar panel capable of tracking a light source throughout the day.

- Aimed to gather sunlight with better than 90% efficiency compared to a fixed panel.
- Processed information from five photodiodes and reliably positioned itself towards light, even in low light conditions or from odd angles.
- We used an Arduino microcontroller to process the photosensor data and run the motors.
- Operated off of an internal battery, and produced enough power to run the microcontroller and the motors while storing a surplus.
- Design went through several rounds of changes in order to meet specification.

A photo of the finished solar tracker.

Photos of several stages in the design.