JOURNAL #4

- Finish the final quadcopter design
- Begin construction of final quadcopter
- Begin taking segments of the CSWP
- Continue implementing and designing features

RESEARCH

The majority of my research has been investigating different arm designs and their effects on strength under what would be a typical load. The next part of the project will be deciding which design will work the best with the 3D printers and materials. All tests are with a nylon 6/10 part and undergo a 5 newton force, which is about double the force required to lift off per motor.
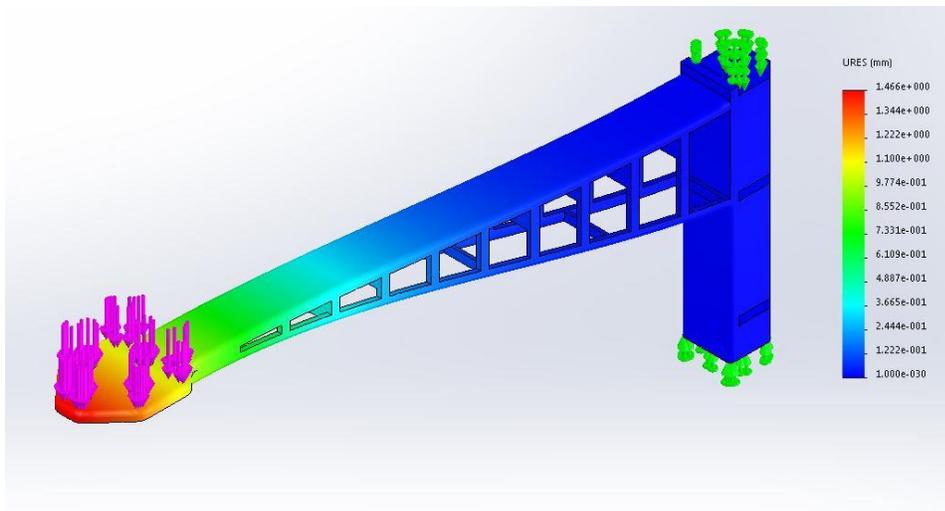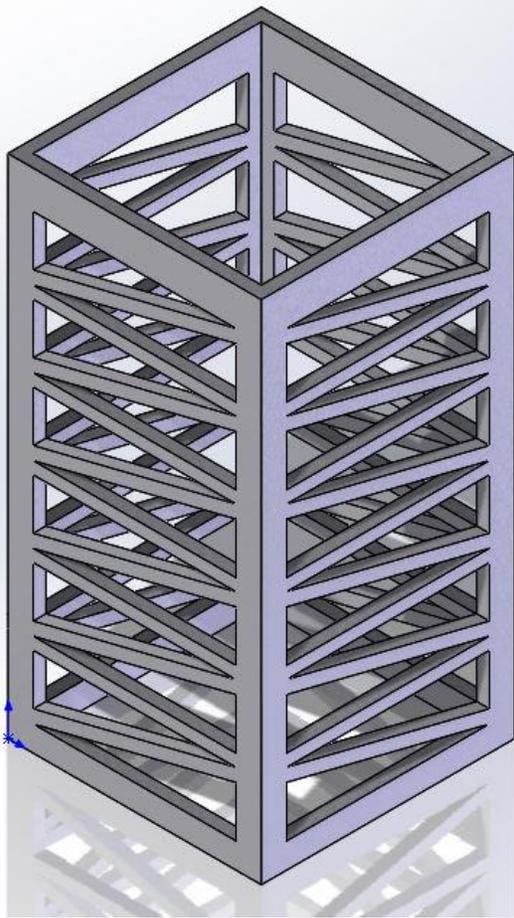

This design has side cuts and partial bottom cuts. The maximum displacement is 1.4 mm. It weighs 47.4 grams and is 1.5 cu.in. in volume.
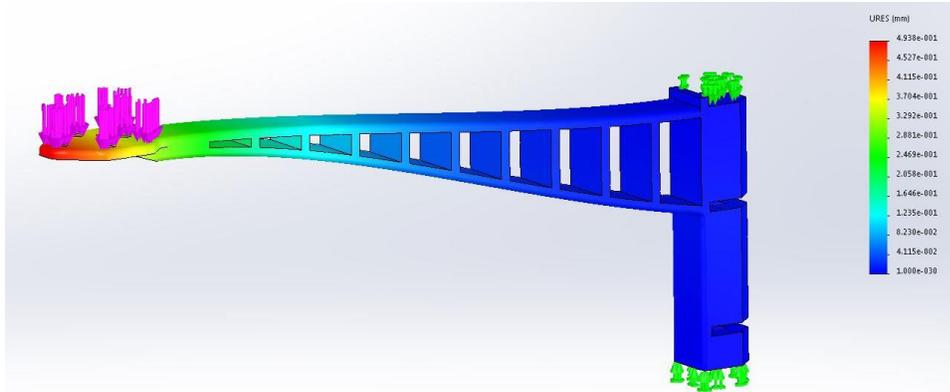
This design only has side cuts. The maximum displacement is .49 mm. It weighs 60.75 grams and is 1.95 cu.in. in volume.
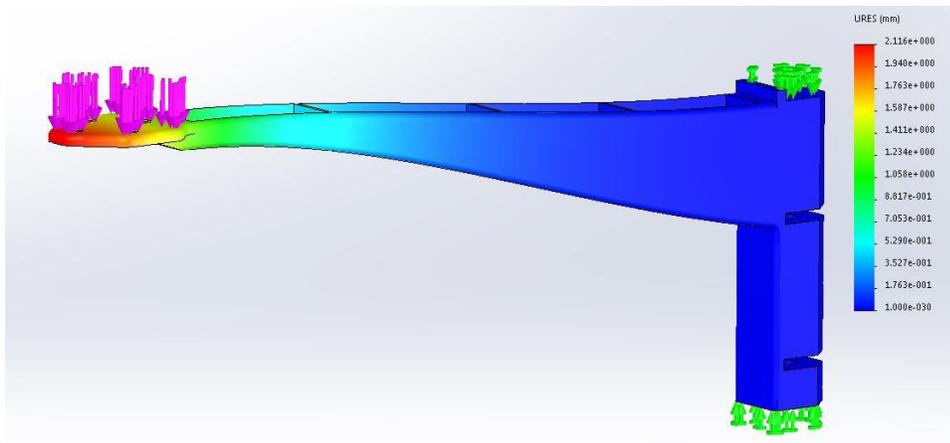
This design only has side cuts. It has the largest maximum displacement of 2.1 mm. The mass is 44.71 grams and is 1.44 cu.in. in volume.

I plan on printing a small test part to become more familiar with the software and how the support material works. My plan is to try and replicate some of the design of the arm in the test part. Notably, I want to duplicate the lattice type structure.

ACCOMPLISHMENTS

- Passed segments 2 and 3 of the CSWP
- Modeled multiple arms for the final design
- Completed more sketches of design features, specifically landing gear and prop protectors

REFLECTIONS ON GOALS AND TIMELINES

At this point in the timeline, the progress is more tangible. It is very easy to see how the things I have learned apply to the design. I am looking forward the next major step forward in the project - the construction of the final quadcopter. The next major roadblock is choosing a design that will work with our budget and machines. The support material will be the biggest problem because the curved design will require a large amount. It is much stronger than the flat design but may not be practical. I plan to gain more insight into the Markforge software by printing small test parts and possibly printing a section of the arm on the makerbot for proof of concept