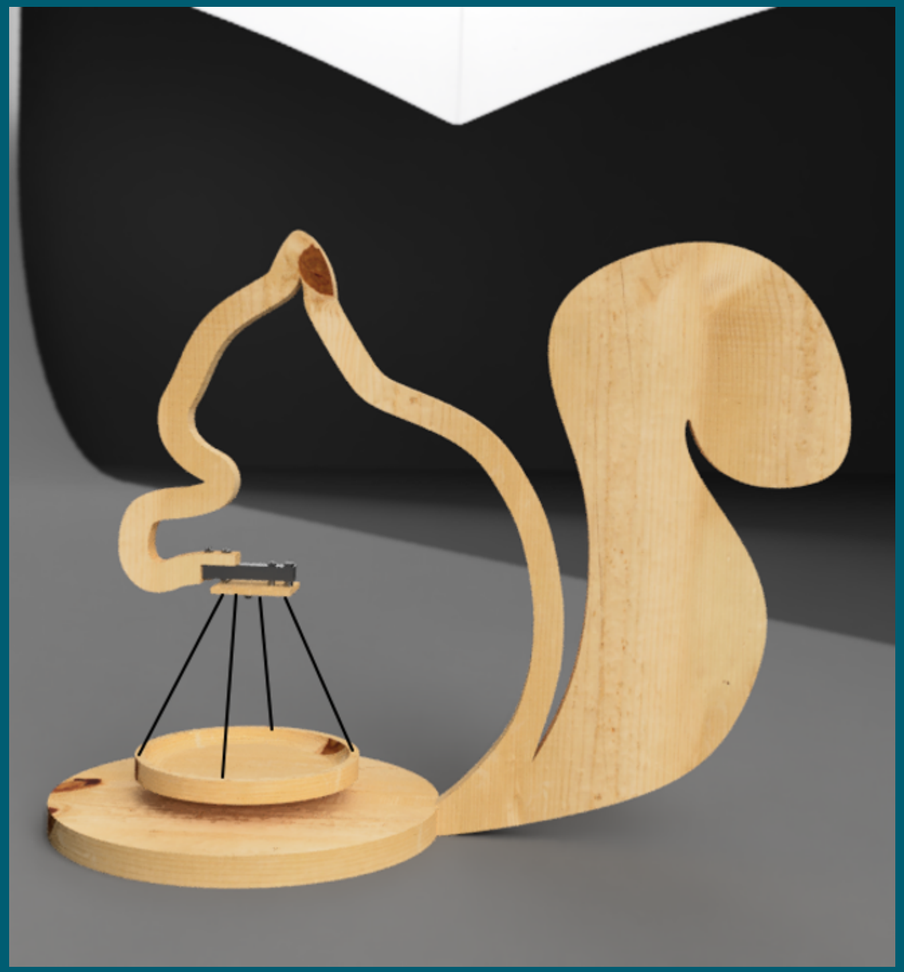
MAKAYLA CAMPBELL

Project Portfolio

They say function over form—but why not both?



ÓSK: Open Smart Kitchen

Summer 2019

- Fruit basket that catalogues the food stored using a strain gauge and Pi Camera. Built for the 2019 Hackaday Contest.
- In charge of product design and strain gauge
- Wrote Arduino code for the strain gauge using a ring buffer that only returned data if there is a change in weight over a fixed set. Designed and modeled the assembly in Autodesk Fusion 360.
- Furthered my coding skills and understanding as well as learned first-hand the limitations of working with a 3-axis CNC machineruit basket that catalogues the food stored using a strain guage and Pi Camera.

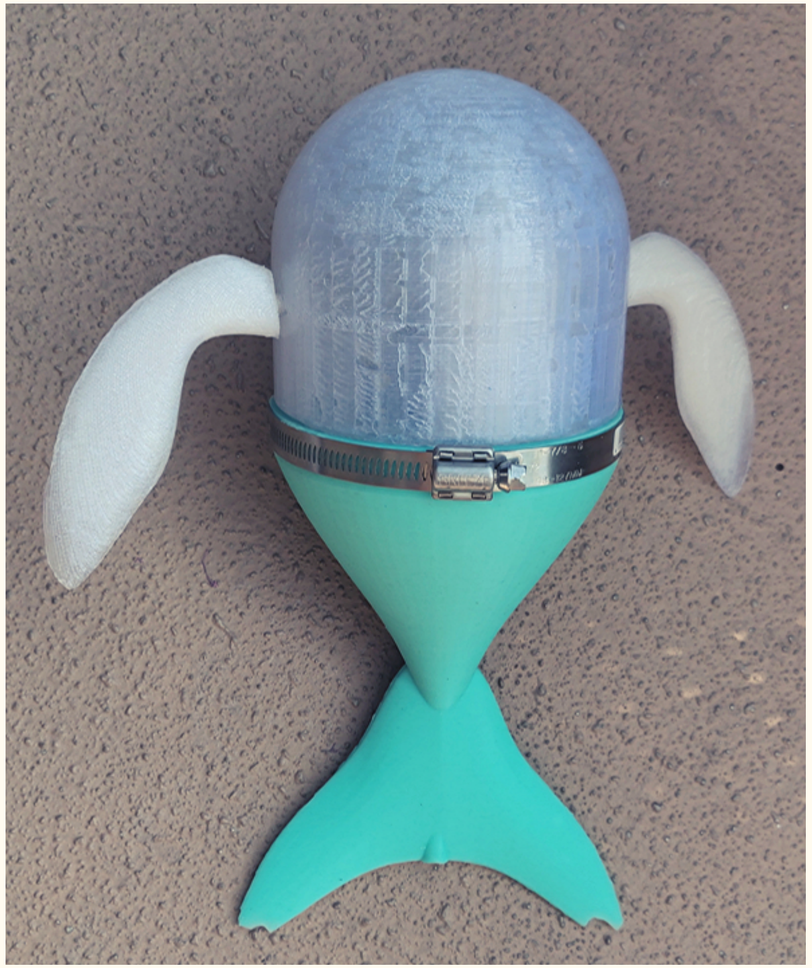
Click here for the project page with further details and logs.

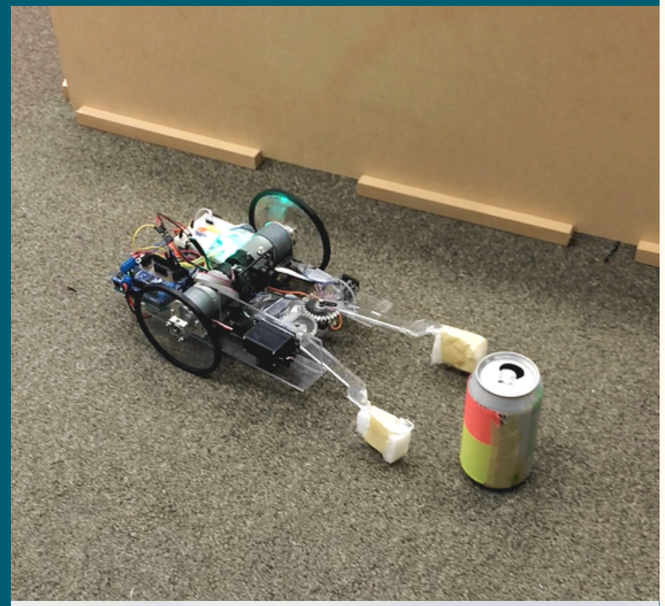
Rudolph

Spring 2019

BIOMIMICRY ROBOT

- Controls lead
- Class assignment to create a swimming robot using biomimicry. Team modeled the robot's motion off of a dolphin's motion
- Wrote functioning Arduino codes with and without Adafruit's triple-axis accelerometer. Researched how a dolphin swims. Assisted in the modeling, assembly, and 3D printing of most components
- Water-proofing mechanisms with externally moving parts can prove to be a grand challenge, but there are a few tricks to help





Murphy:
Autonomous Retrieval Rover
Summer 2017–Spring 2019

PROJECT DEVELOPMENT & CURRICULUM BUILDING

Engineering 7A/7B introduces Freshmen to hands-on projects early on in their college career. Murphy was inspired by autonomoous vehicles and created to make a new project to keep up with up-and-coming technologies

- Worked mainly on the pickup mechanism (both the building and coding)
- Assisted in curriculum development, designing labs and lectures for the future class. This includes designing and modeling the custom Lego piece on the right for hands-on linkage lab activity.
- Became more comfortable with Arduino language and learned how to communicate and present ideas to people in a clear and educational manner

Watch Murphy in action Below!

Water-Saving Nozzle

Fall 2018 – Spring 2019

- Project member of ESW's water nozzle project
- The goal was to 3D print a misting nozzle with a flow rate of 0.2 L/minute, reducing the flow to 35% of the original flow rate
- Designed, modeled, and 3D printed multiple test nozzles
- Learned first-hand the limitations of 3D printing and the stresses the machines are put under for small, high-precision manufacturing. Also successfully applied theoretical fluid dynamics to a tangible result.roject member of ESW's water nozzle project

Stackable Music Module

Winter 2019

- Team Lead
- Mechanical design class assignment to make a music module out of a PVC t-pipe. Each module plays one measure of a song so that, once all the modules are stacked together, an entire song is played
- Researched sensors to determine the fastest and most accurate sensor for close quarters. Soldered multiple components and lead the main design process.
- Watch it blink and sing here!

SolidWorks Tutorial

Winter 2019

As a member of ESW board, we aim to provide our general members with workshops for skills and tools that will be relevant to their engineering career both in and out of school.

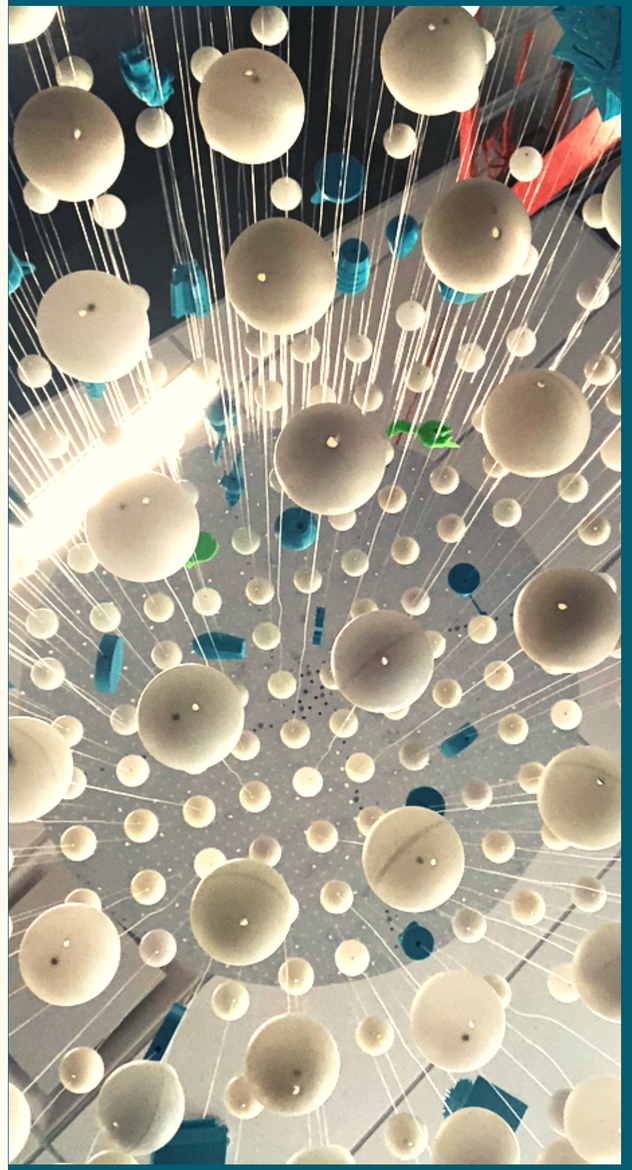
Having the most CAD experience, I made a tutorial to a simple assembly in SolidWorks. I designed the exercise/tutorial to be something that would cover the most useful and common tools for students starting out with SolidWorks.

Click here to watch the tutorial.

Our Earth Student Housing Art Installment

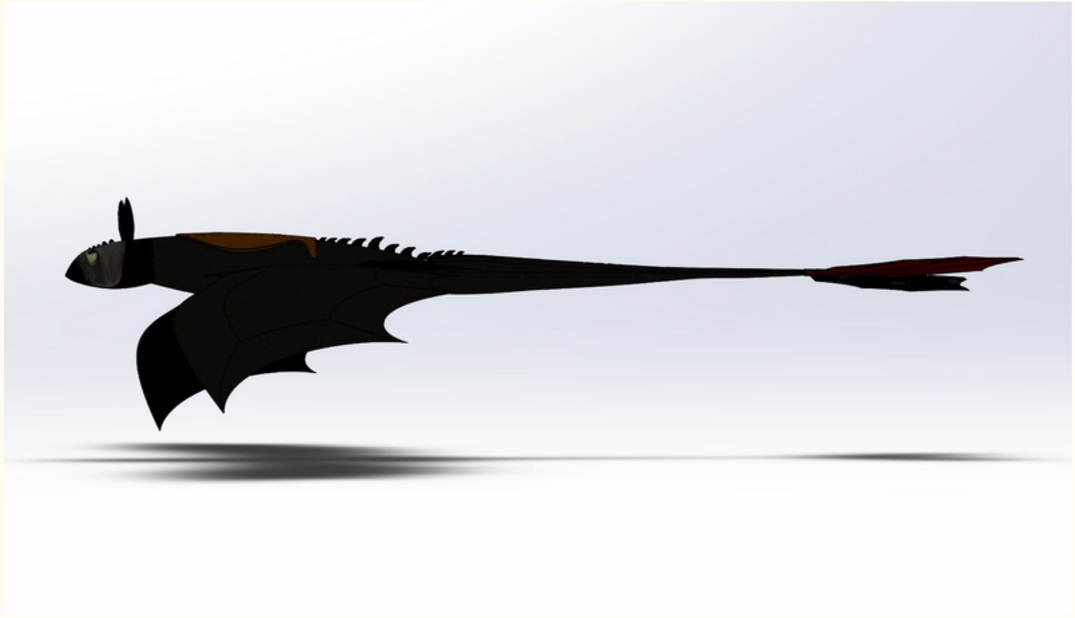
Spring 2018

- Project Co-Manager
- The goal of this two-quarter class project was to build a sculpture from recycled plastic collected from students in the Mesa Court Student Housing. The sculpture was placed in the study room of the housing community.
- Assisted in design development and physical building of the structure. As a co-manager, I communicated with the team as well as coordinated with campus administration about the installation of the sculpture as well as the logistics of collecting plastic from students on campus
- Gained experience in communication and learned how to address heated conflicts among team members

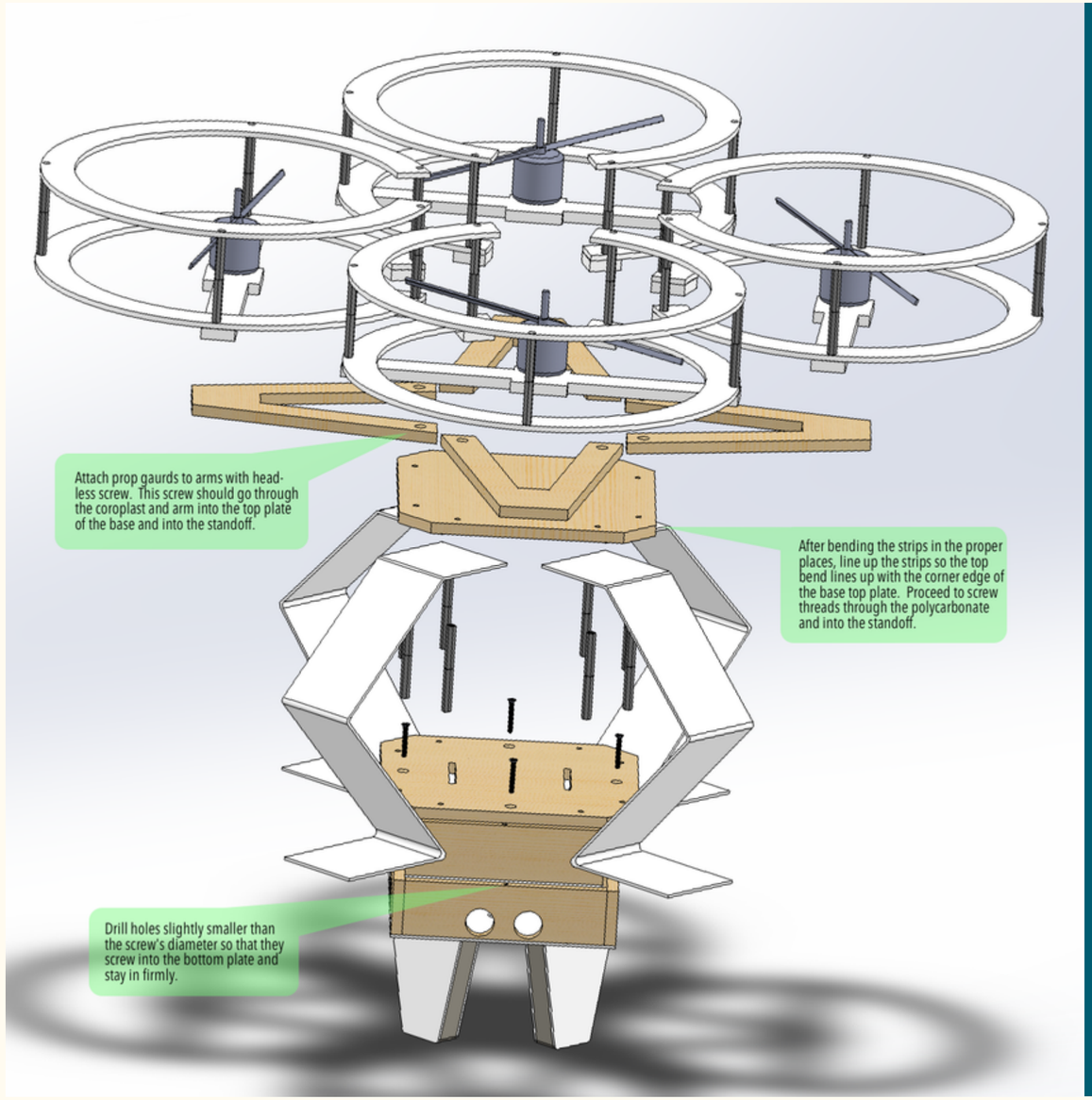


Toothless CAD Model

Spring 2017



Class assignment to model a complex assembly in SolidWorks.
I wanted a challenge, so I chose to try modeling Toothless from *How to Train Your Dragon*.
I learned how to use more complicated tools, such as lofting, in SolidWorks I would not have otherwise.
Click below for the project video



Quadcopter

Fall 2015 – Winter 2016

Before becoming an Undergraduate Assistant for Engineering 7A/7B, I was a student in the class. I was Team Captain for both my fall quarter and winter quarter teams, so I lead the teams in designing and building the robots. The second quarter added an Arduino task in addition to building a quadcopter. I learned from the mistakes and struggles tips and tricks for building quadcopters and well as manufacturing by hand.

Click below to watch our team's winter quarter video.