

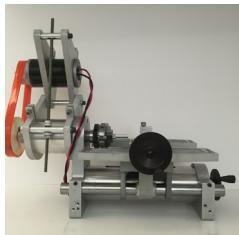
AMNA A. MAGZOUB
PROJECT PORTFOLIO
MECHANICAL ENGINEERING
MIT '17

HI. I AM AMNA MAGZOUB.
MIT 2017. MECHANICAL ENGINEER.
PRODUCT DESIGNER.
BIOLOGY NOVICE.

I'm seeking full-time opportunities as a Product Designer
and Engineer. If you like my work, please contact me.



TABLE OF CONTENTS



Elements of Mechanical Design

4



USAID, Visualizing Data for HESN

14



Process Engineering Processes, Stride

6



Introduction to Geometric Design, Designing a Box

16



How to Design (almost) Anything, Smart Shelves

8



D-Lab, Voca Member and Techcon Innovator

18



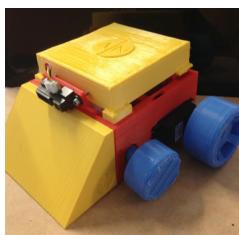
Design and Manufacturing, Citrus

10



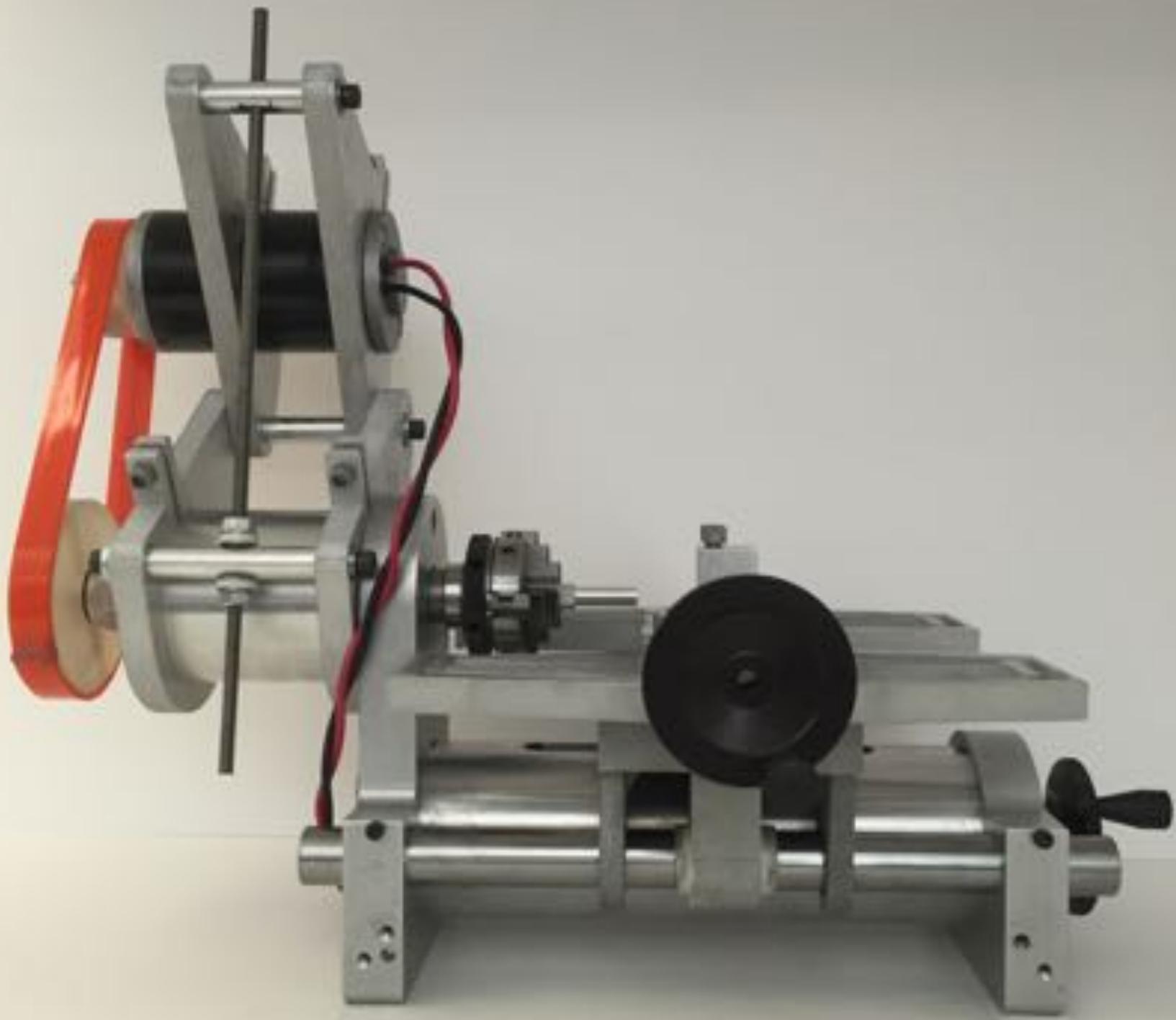
Miscellaneous

20

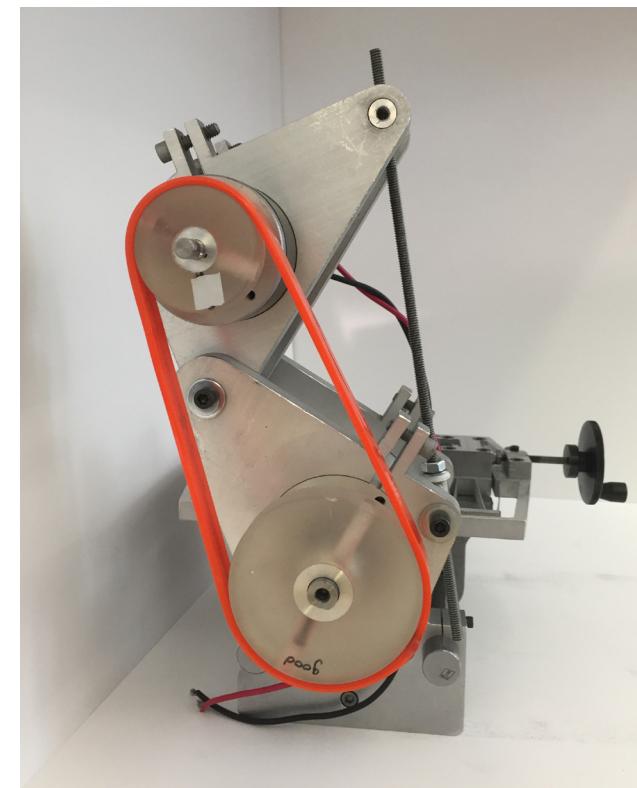
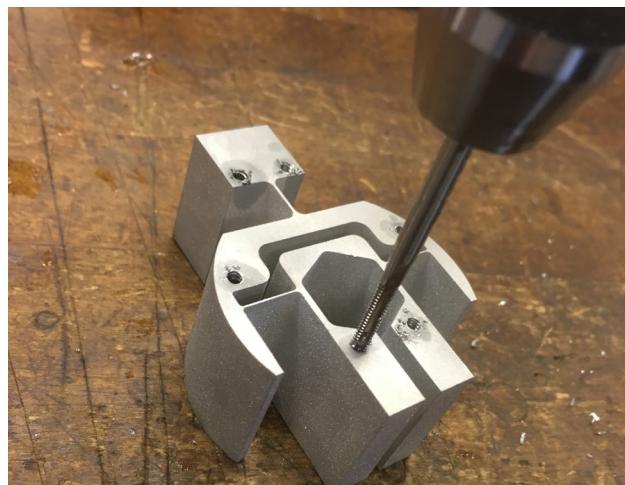
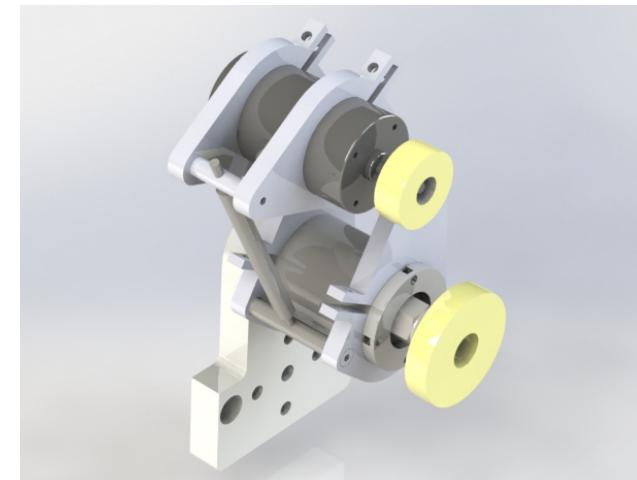
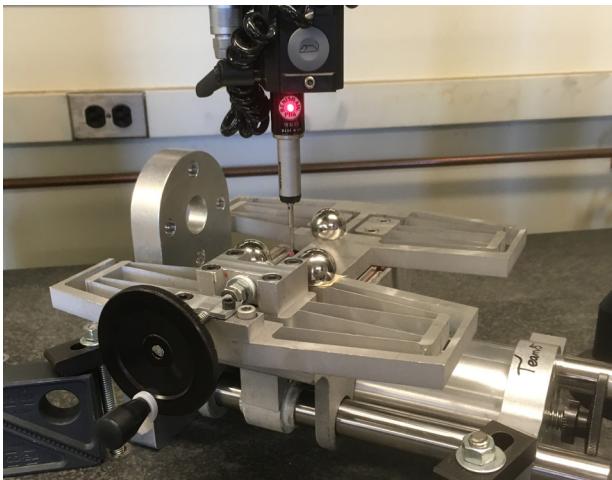
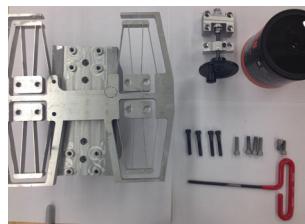
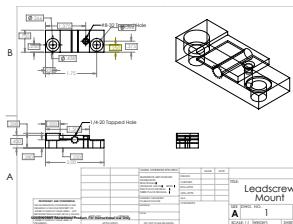


NVBOTS, SumoBots and Animals

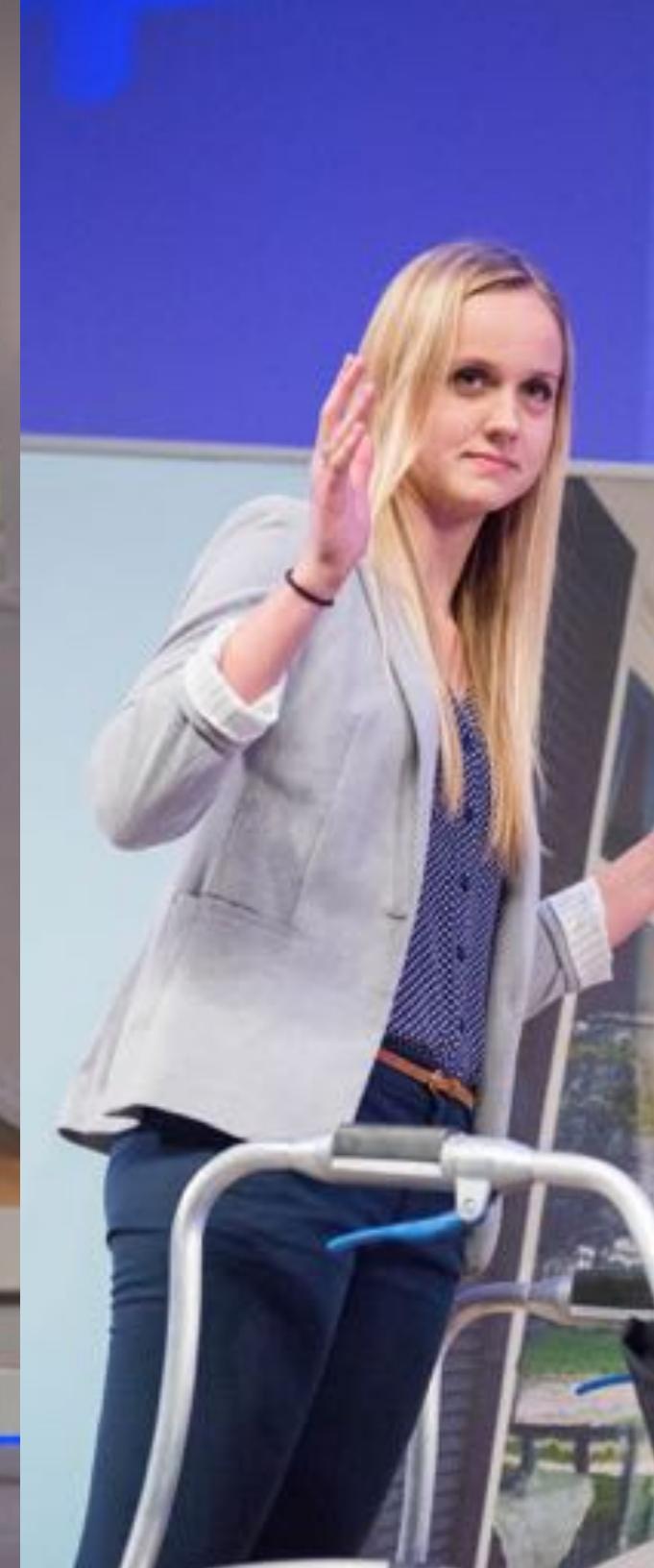
12



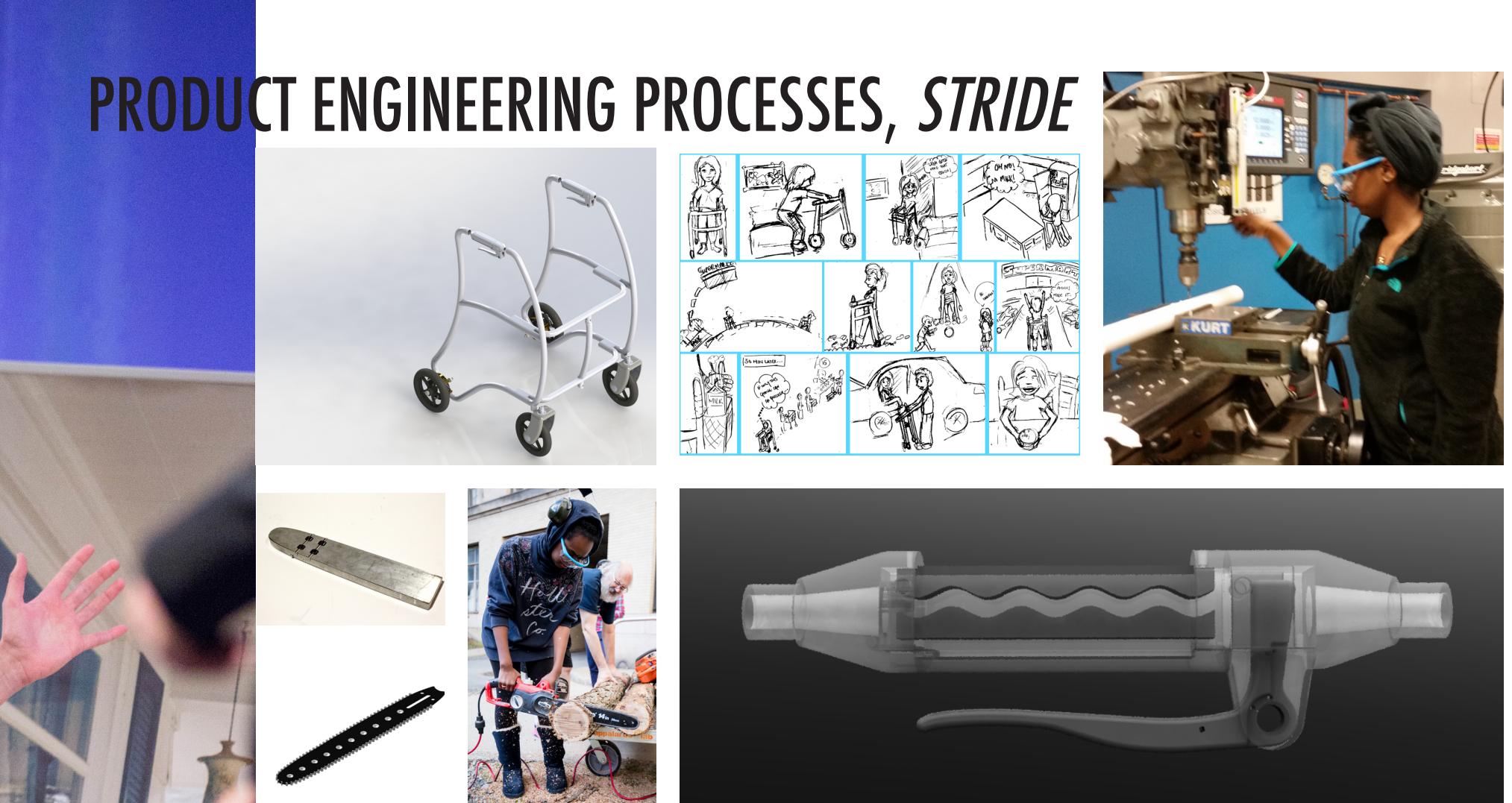
ELEMENTS OF MECHANICAL DESIGN



My team of five was tasked to design, build and test a desktop lathe. As CAD Guru, I had to manage all the CAD parts and assemblies, produce drawings and I was responsible for designing the motor mount system. As Documentation Guru, I was responsible for keeping the budget, ordering parts, setting and maintaining team schedule, and managing documentation of all parts which includes photos of fabrication, videos of assembly and experimentation and references to calculations and models. I also was responsible for 3DP and thermoforming processes and occasionally assisted with fab.



PRODUCT ENGINEERING PROCESSES, STRIDE



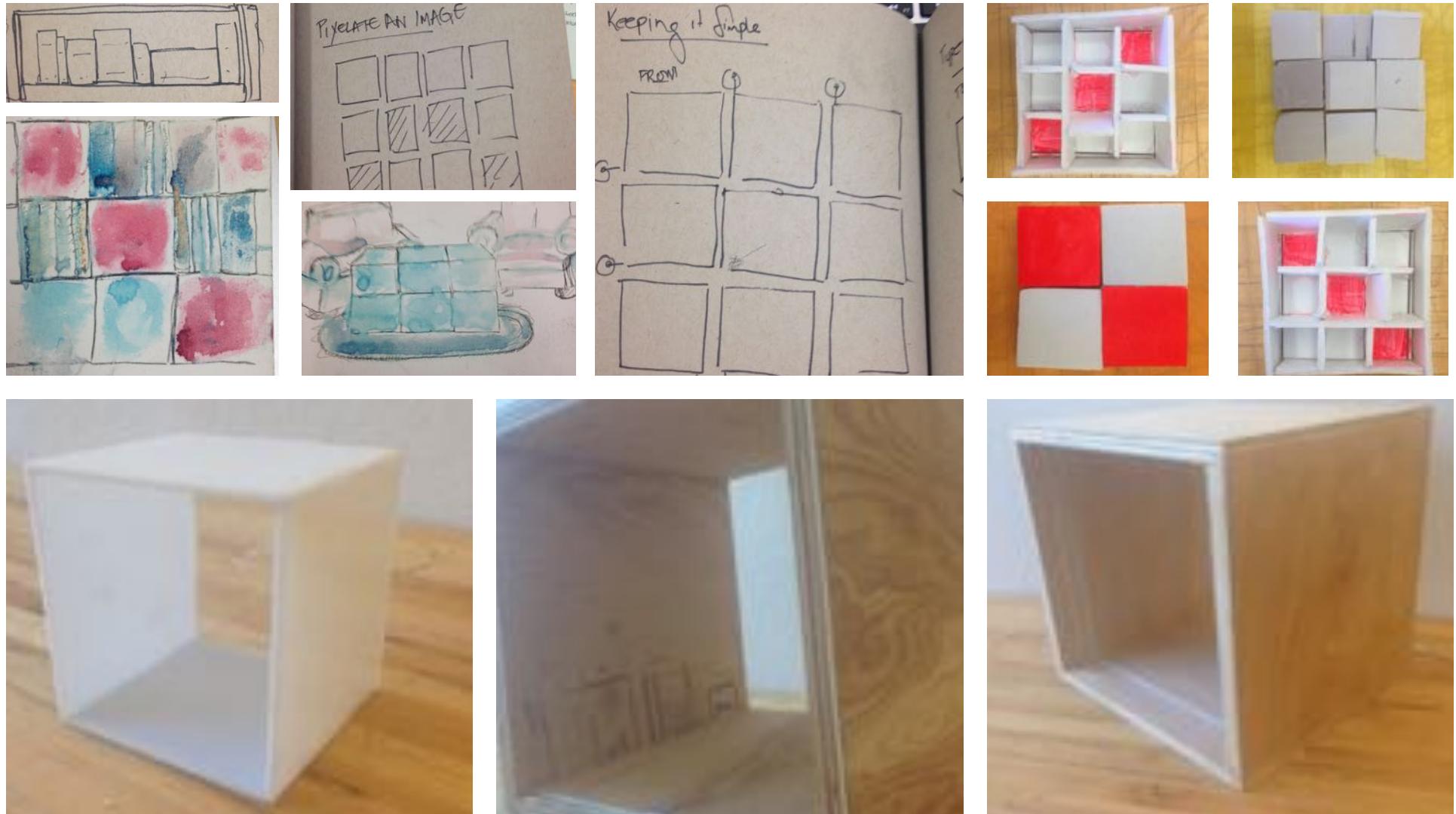
In this long class, I was one of the two System Integrators, responsible for leading a team of 18 engineering students to create a product in three months, under the theme "Rough, Tough and Messy".

The final product, Stride, is a double braked walker that exists in a locked-state stationary when not in use, and makes use of a user's weight to unlock it when in use.

Throughout the term, I had to wear several different hats. Most times, I had to lead and organize my subteam through meetings and planning, and coordinate with instructors and mentors. At other times, I worked in the lab machining and testing prototypes. I also took initiative in developing the storyboard writing and defining product vision. I was lead on 3D printing parts and trained my three team members to use SLA and FDM and printers. I became technical lead managing the design, fabrication and delivery of the product in time for presentations.



HOW TO DESIGN (ALMOST) ANYTHING, *SMART SHELVES*

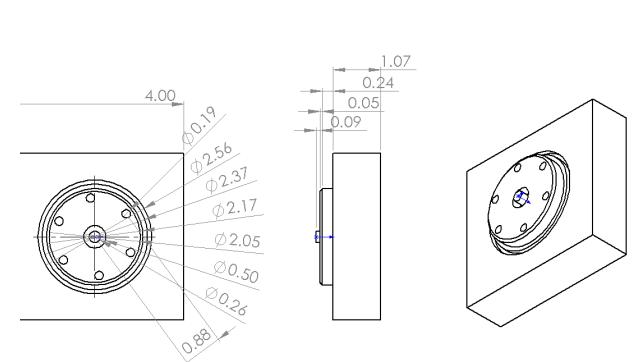
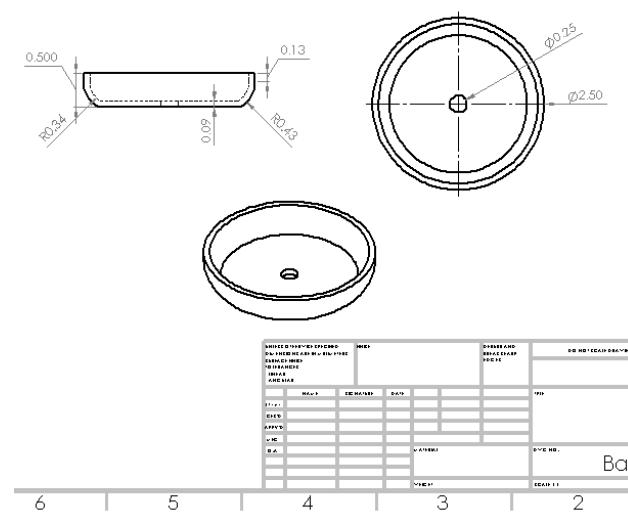
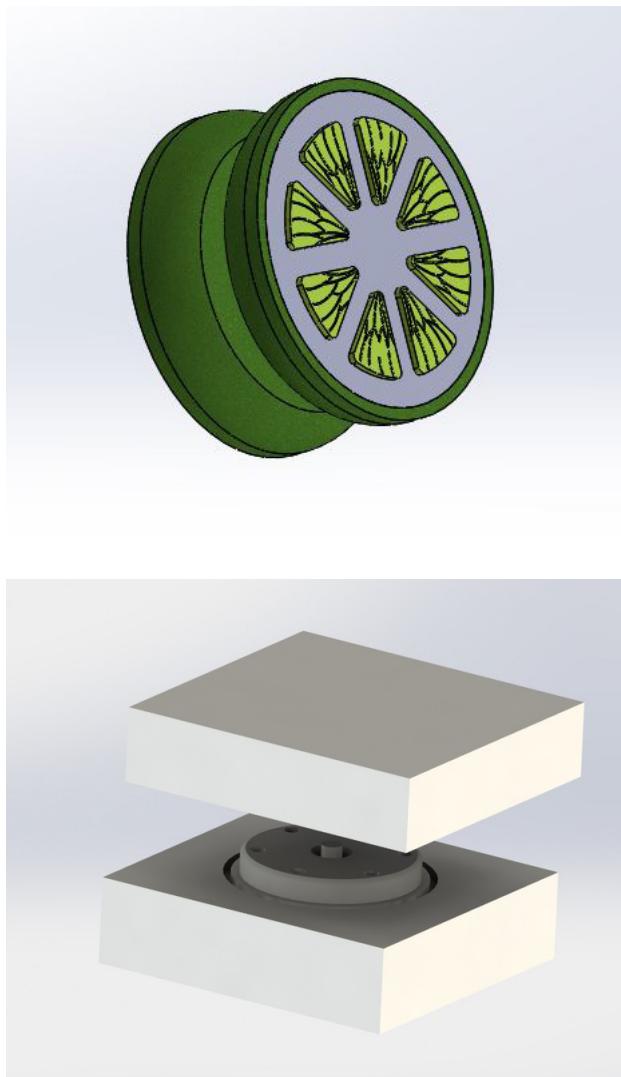


In this studio style class, we met weekly to work on a project under the theme "light". My project was a set of "smart shelves", with embedded LEDs that light up when an item on that shelf is looked up on an external directory. For more information please follow my [website](#) for the class, or the QR code on the right.



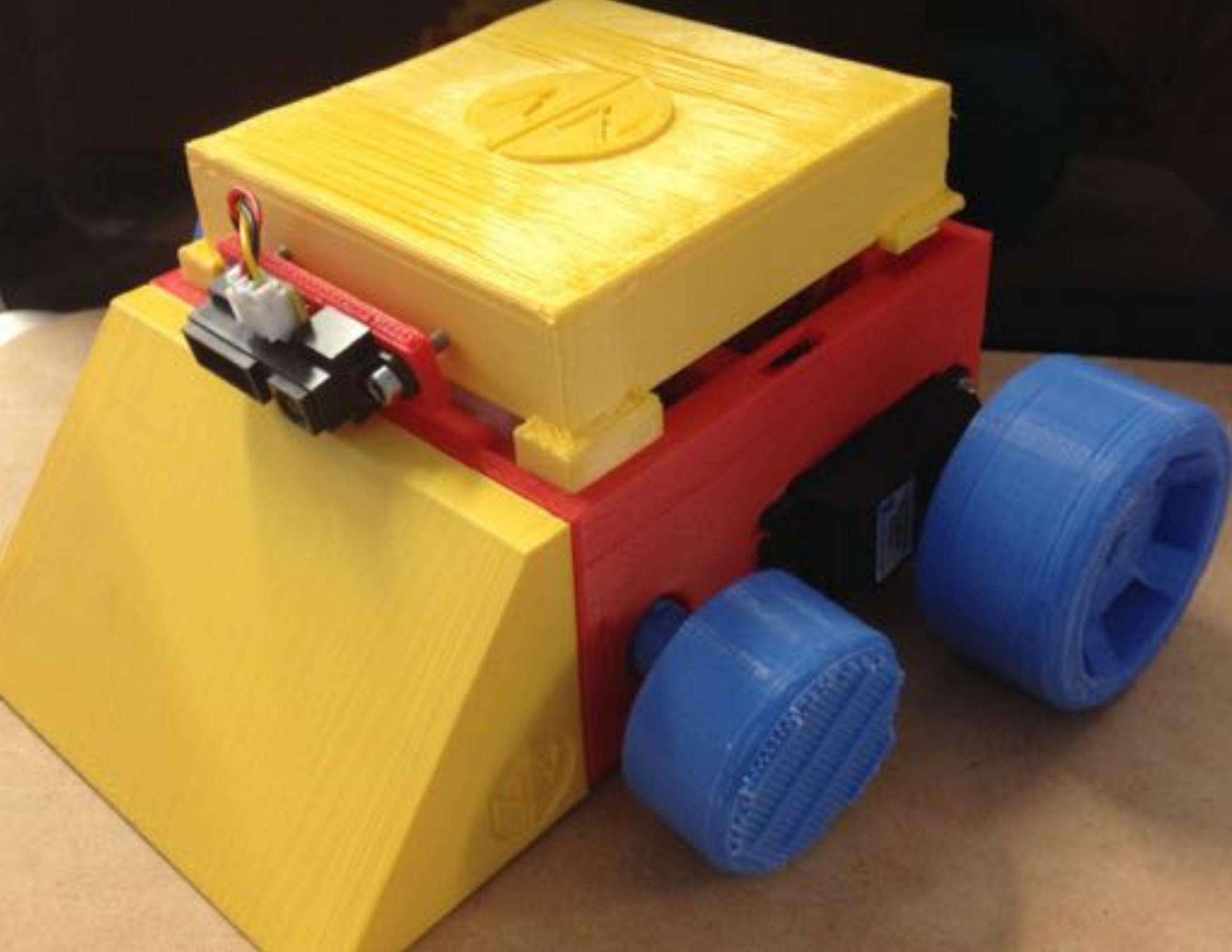


DESIGN AND MANUFACTURING II, CITRUS

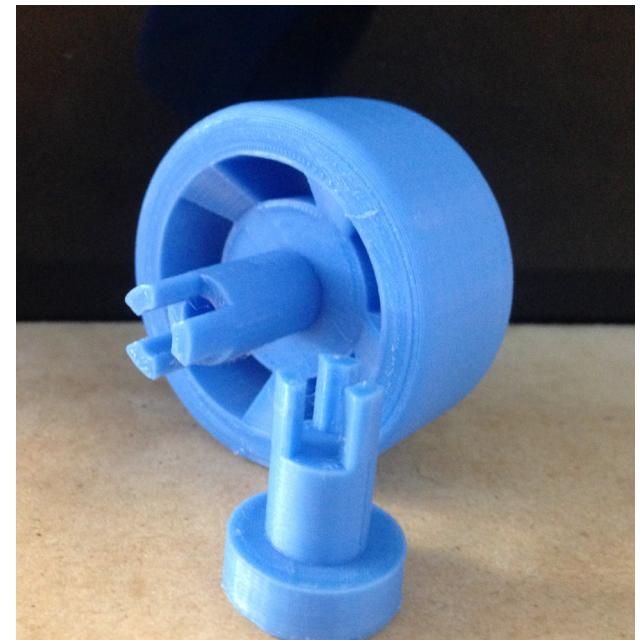
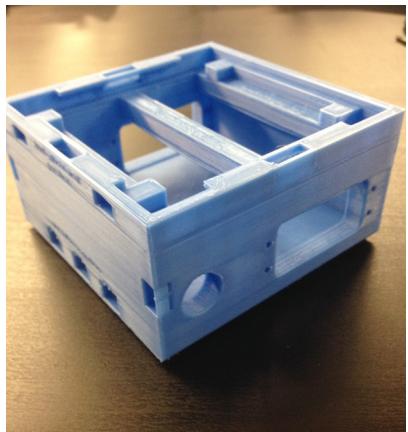
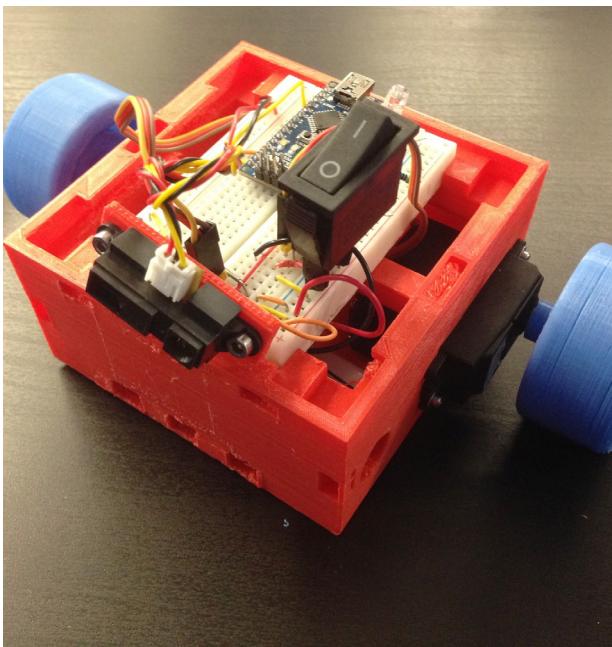
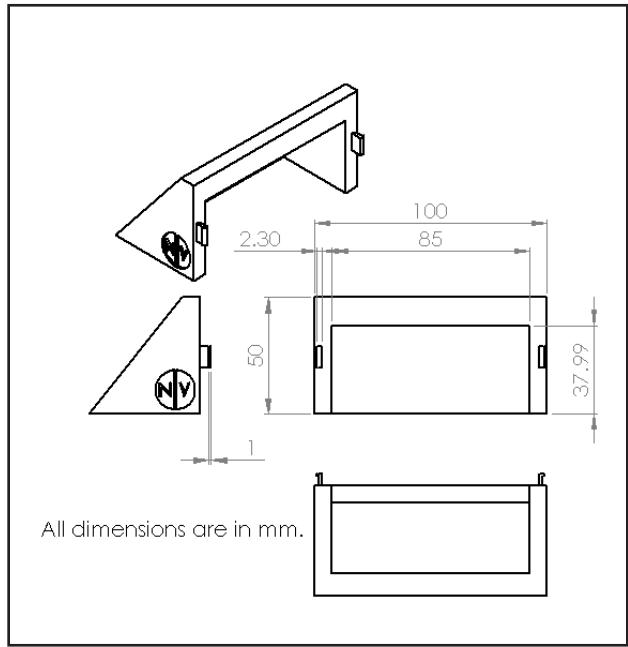


In this class, I learned design for manufacture and assembly (DFM/DFA), process optimization, CNC machining, injection moulding and thermoforming. I was responsible for designing and manufacturing 100 of the outer bases, using SOLIDWORKS and MasterCAM for CAD/CAM, ProtoTRAK and a BOY Injection Moulding machine. To see more about this project, please follow the [website](#) or watch our video using the QR code.





NVBOTS, SUMOBOTS AND ANIMALS



During this internship at New Valence Robotics (NVBOTS) I designed two lesson plans and used their FDM 3D printers. The lesson plans were to teach middle schoolers about animal bone anatomy and another geared towards high schoolers to design and code their own Sumobots.



(1 of 87)

**HESN Partners in United States**

HESN Lab Social Entrepreneurship Accelerator at Duke

Partner Name Sproxil

Type Commercial Enterprise

Description This innovator is part of the first SEAD cohort. Provides world-class brand protection services in emerging markets by allowing consumers to verify product genuineness within seconds through SMS texts.

Website

Zoom to



USAID, VISUALIZING DATA FOR HESN



Welcome to DevResults, the Lab's new M&E platform! Here's how to find the information you need to know.

If you want to ...

- learn about a project go to [project overviews](#).
- read an implementer's narrative on previous fiscal years, go to [report narratives](#).
- see indicator results organized by project, program or the Lab, view pivot tables, aka "[pivot reports](#)"
- see descriptions of innovations, partners, and more go to [data tables](#).

Project Overviews
(Note that projects are referred to as "Activities" in DevResults)

The project overview page is where the user can read and learn about the different projects and a summary of each project. Here one could find summaries, previous reports, various other details for each project.

To access project overview pages

Choose the project you are interested in by either:

- A. Searching for a particular project in the Search Bar

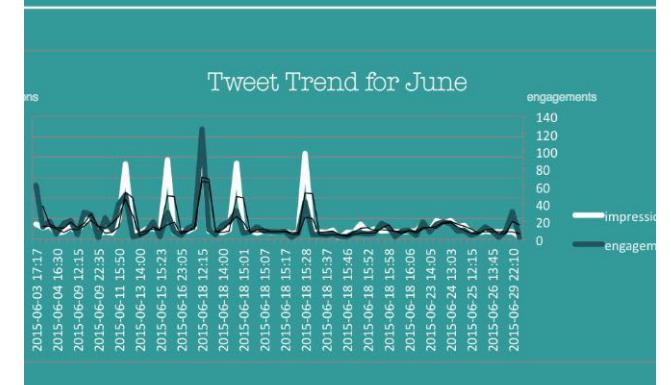
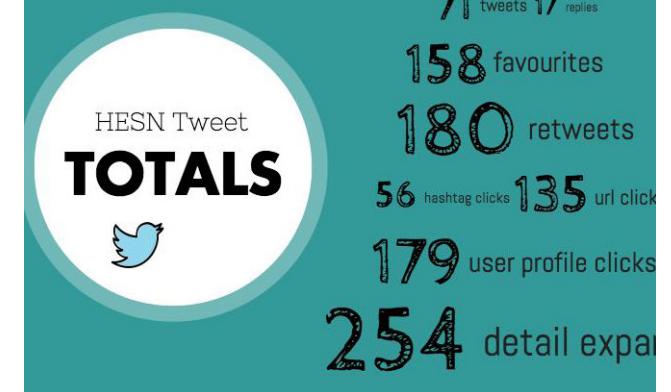


USAID
FROM THE AMERICAN PEOPLE

**U.S. GLOBAL
DEVELOPMENT
LAB** Powered by USAID

In the summer of 2015, I interned with USAID's Higher Education Solutions' Network team. I worked on data and project management, graphic design and data visualization. I also had the opportunity to volunteer at the Young African Leaders Initiative Conference, (YALI) and meet many highly esteemed personnel, including the USAID Acting Administrator, Alfonso Lenhardt.

HESN Social Media Report - June

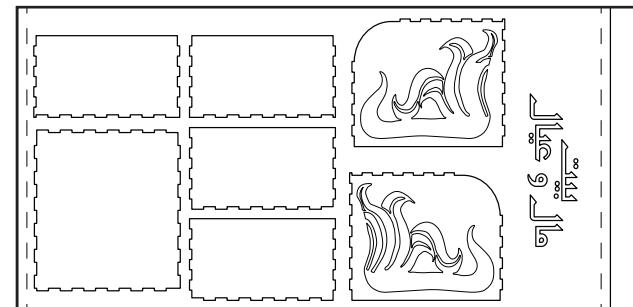
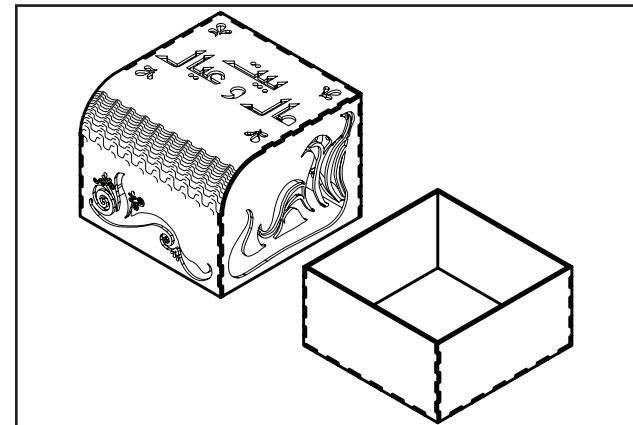
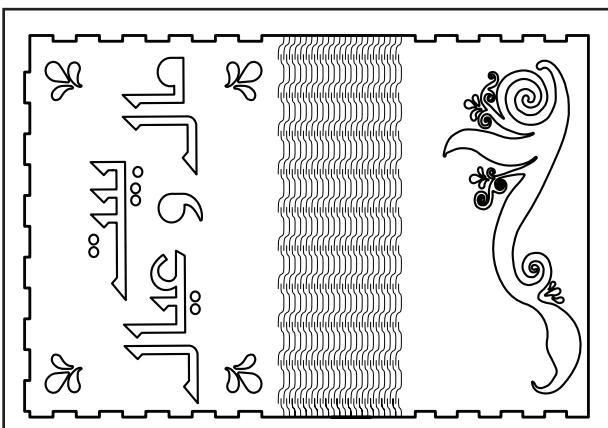
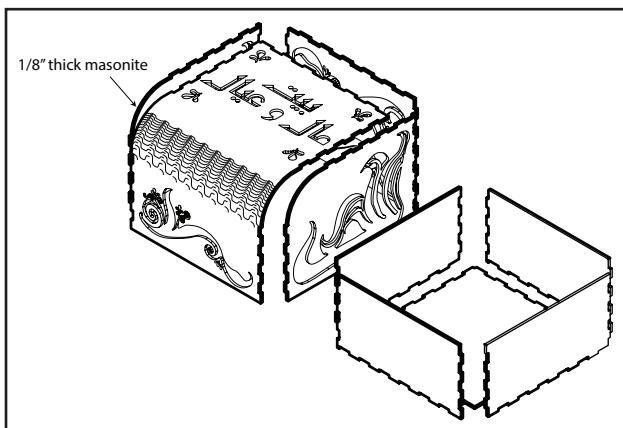




INTRODUCTION TO GEOMETRIC DESGIN, DESIGNING A BOX



بیت مال و عیال



In this exercise, I designed and fabricated a box inspired by Sudanese wedding symbolism, such as henna and greetings. The box is a part of a two part assignment where interlocking letters were later fabricated to fit into the box. Through the exercise I learned how to use Adobe Illustrator, Rhino 3D and later on, Autodesk 3DMAX for rendering.



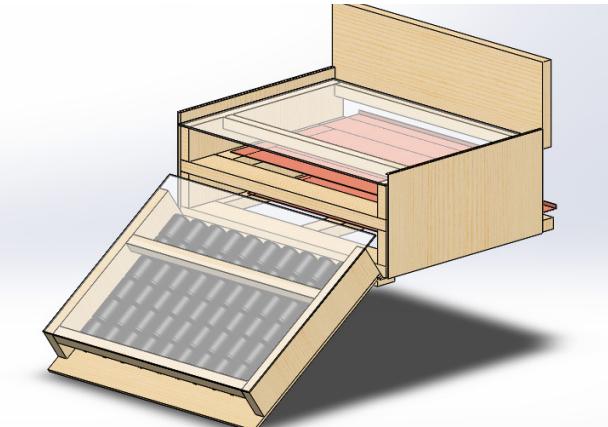
New insight at
every level
from our work

New insight
at every level
from our work



During the survey, students were asked to rate their satisfaction with their university's teaching and learning environment. Satisfaction was measured on a Likert scale from 1 (very unsatisfied) to 5 (very satisfied). The results show that 60% of students are very satisfied with their teaching and learning environment. This is a significant increase from 55% in 2013. The most common reason for this improvement is better teaching and learning resources.

D-LAB, VOCA MEMBER AND TECHCON INNOVATOR

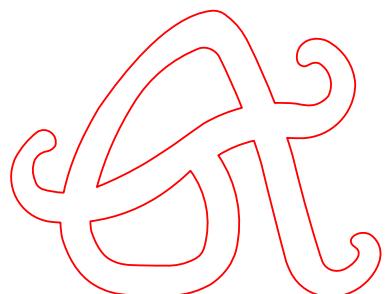


While a member of Voca, I helped design and build a solar dryer to reduce moisture in avocados to better prepare them for pressing to extract oil, in partnership with a local community in Leguruki, Tanzania. I was responsible for market research and some experimentation as well as heavily assisting in the fabrication of the first prototype. Later on that semester, I also participated in USAID's TechCon conference in Berkeley, CA as an innovator and represented Team LIFT (Local Innovation Facilitation Team), presenting the potential for researching innovative communities such as the one in Leguruki, in order to create a Local Innovation Index. We reached the semi-final round.



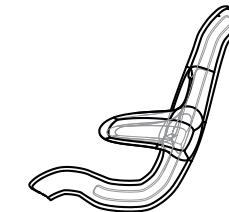


MISCELLANEOUS SKETCHES, DOODLES AND DESIGNS



4.500 - Introduction to Geometric Design
Exercise 7: Shelter Seat

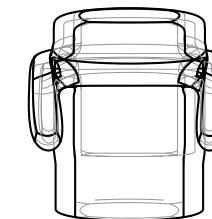
Amna Magzoub



Side View



Isometric View



Top View



Front View



© 2017 AMNA A. MAGZOUB
(617) 583-2371 | amagzoub@mit.edu