

Faith Jones

Engineering Design Portfolio

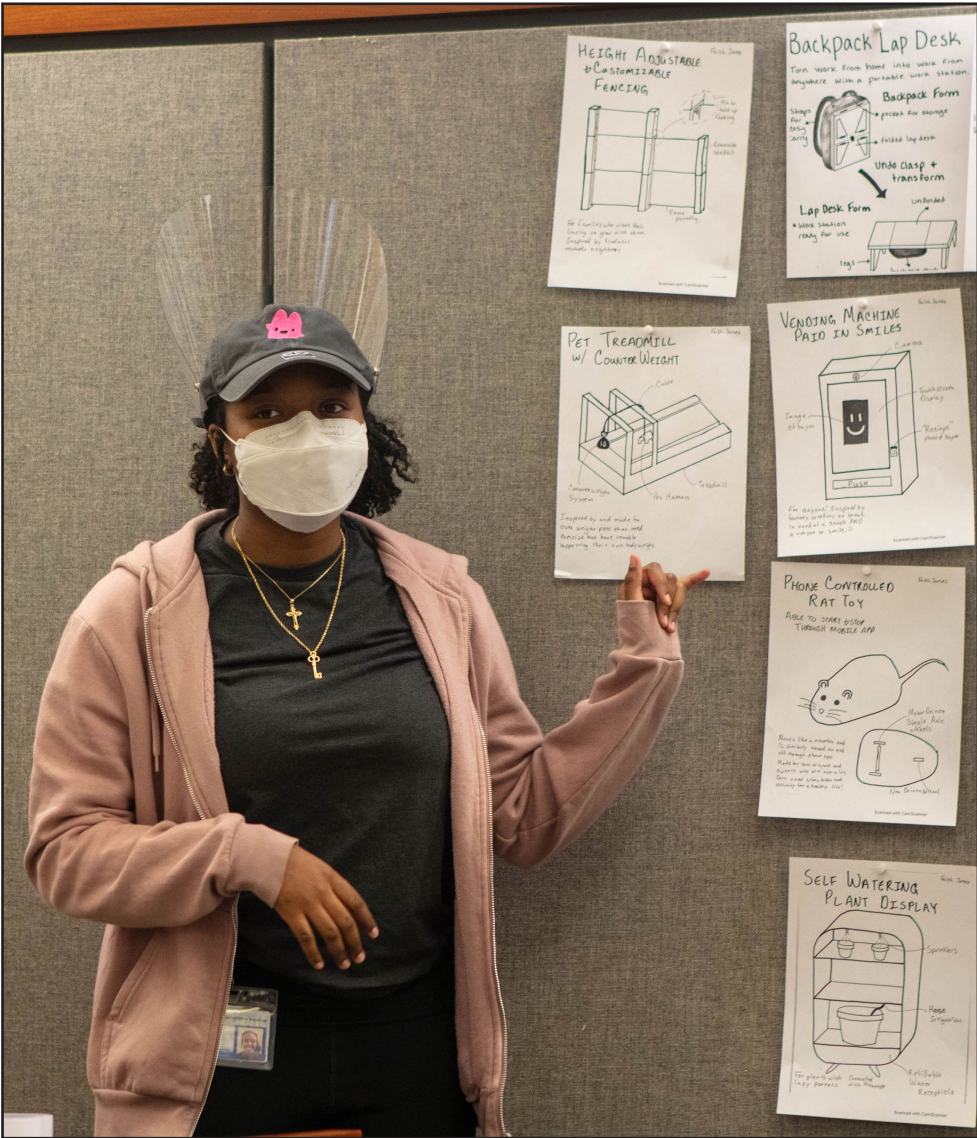
Introduction

Hello, my name is Faith Jones!

I am recent graduate. I studied Mechanical Engineering with a concentration in Industrial Design.

I am interested in product engineering, but in particular I have a love for thoughtful and playful design.

faith.jones2.718@gmail.com
(773) 677-4046



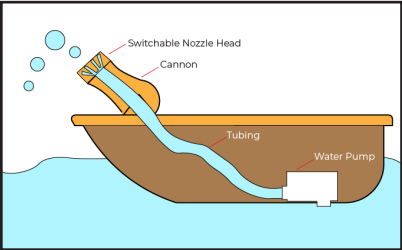
Battle Boats Spring 2018

A remoted controlled toy boat designed for competitive play

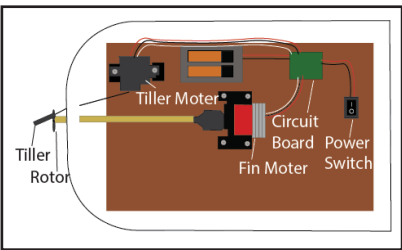


Battle Boats is a toy product prototype I designed with a team of 4 other MIT freshmen for an introductory product design course.

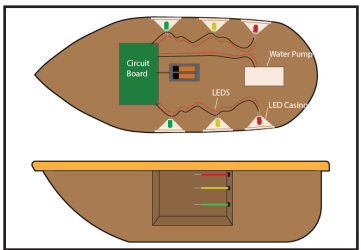
How it works



Shooting



Driving

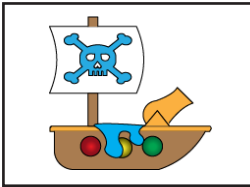
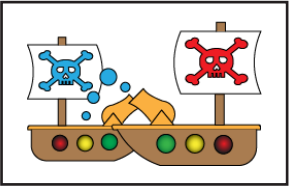
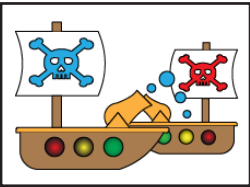


Scoring

Early Prototyping



How to play



My Role

As part of this team I designed CAD models for the boat, prototyped and user tested boats aesthetics, and fabricated waterproof boat enclosure

Skills Used

- Solidworks CAD
- Foam Rapid Prototyping
- Thermoforming
- Lasercutting

Storable. Simple. Strong.

SOLACE

Solace is foldable life raft for individuals and families in flood/hurricane prone regions to stay secure while waiting or moving to safety after a severe storm.

20 Second Deployment

350 LBS Capacity

Compact 2.5'x4' Size

Weights 40 LBS

41 Million
Americans living in flood-prone regions

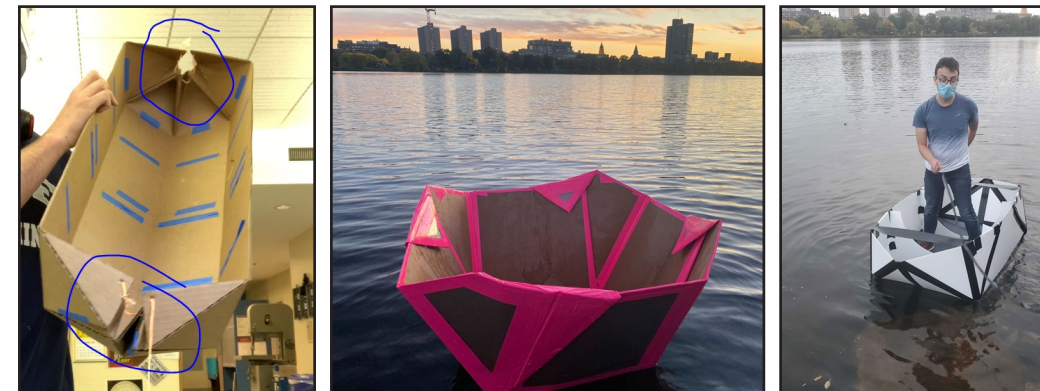
\$150
Retail Price

Solace was design by myself and a team of 15 other students for the mechanical engineering product development capstone course.

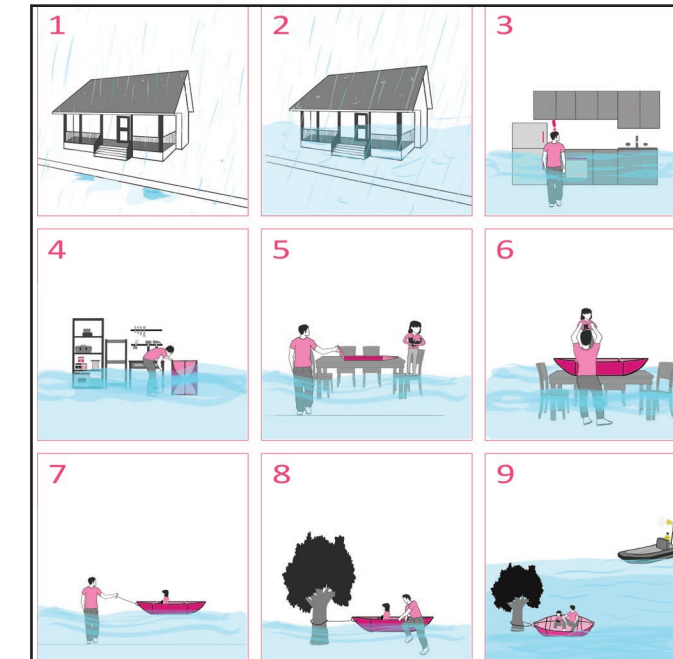
Final Prototype



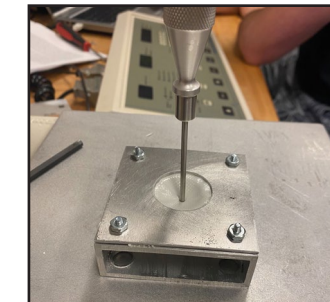
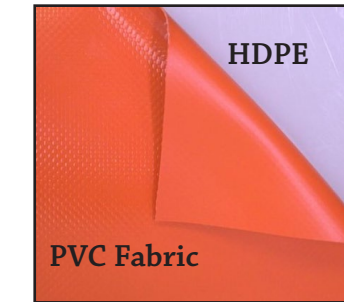
Iterations of Form



Solace Story Board



Material Testing

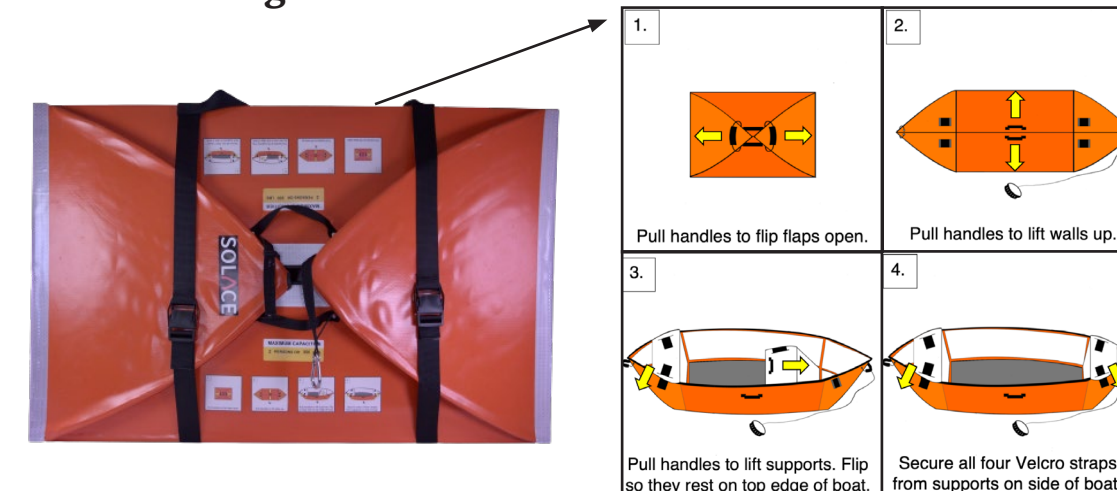


We performed puncture tests as well as tensile tests on connection with different adhesives to determine the best materials

Full Scale Prototype



Industrial Design



My Role

On this team I worked on the adhesive and seam teams. Toward the final prototype creation I lead the Graphics and Industrial Design teams.

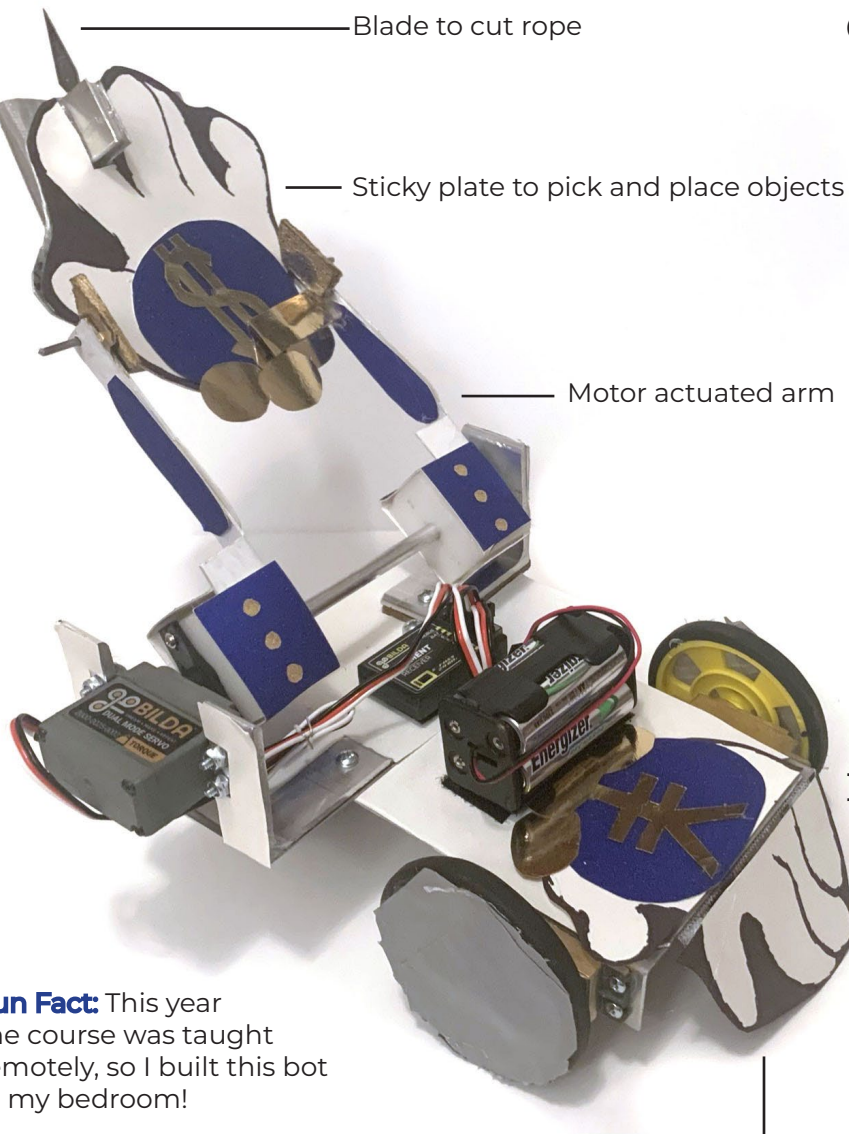
Skills Used

- Rapid Prototyping
- Material Property testing
- Adobe Illustrator and Photoshop
- Fabrication using soft materials

The Hand

Spring 2021

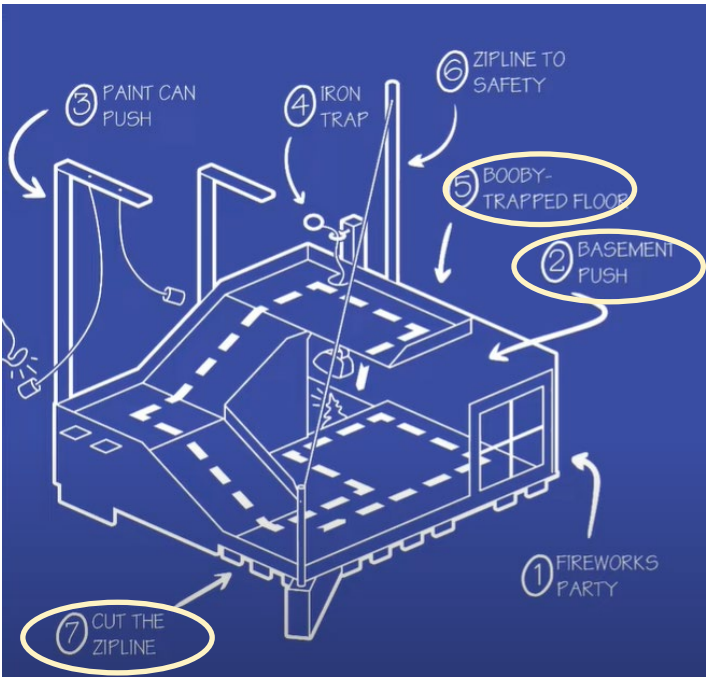
The Hand is a robot design to complete tasks in order to compete in a game



Fun Fact: This year the course was taught remotely, so I built this bot in my bedroom!

Passive pushing mechanism

Game Board and Strategy



- Driving up and down incline
- Picking up and placing game objects
- Cutting rope above game board
- Pushing game objects

Design Calculations

Physical Homework #3: Hill Climber

1) $M_{wheels} = ?$

$\sum F_x = F_{pull} - F_g \sin \theta = 0 \Rightarrow M = \frac{F_{pull}}{g \sin \theta}$

pulling so that the bot moves at constant velocity $\sum F_x = 0$

$\sum F_y = F_n - F_g \cos \theta \Rightarrow F_n = F_g \cos \theta$

$M_w = \frac{F_{pull}}{g \sin \theta} = \frac{22 \text{ lbs}}{9.8 \text{ m/s}^2} \Rightarrow M_w \approx 2.444$

2) Torque Servo @ 6.0V stall torque 300 oz-in

2 motors = max torque output $\Rightarrow 600 \text{ oz-in}$

Mechanism

$\tau_{motor} > \tau_{mem}$

$\tau_{mem} = F_{g \text{ mem}} \cdot r_{max}$

$600 \text{ oz-in} = F_{g \text{ mem}} \cdot 5.5 \text{ in}$

$F_{g \text{ mem}} = 109 \text{ oz} \approx 6.8 \text{ lbs}$

Definitely doable!

3) Blank up side view

The Hand

Spring 2021

cont.

Mechanism Prototyping

Transporting & lifting jacks

Scoping variations

Fixed

Motor Driven

Used for lifting and pushing jacks over the edge

Stick

Could be in front of or in center of bot

possibly able to detach cylinder and drop into window box

Based on feedback and calculations made reductions and improvements to make subsystem more robust

03/10/2021

03/12/2021

03/15/2021

03/18/2021

03/22/2021

03/25/2021

03/28/2021

04/01/2021

04/04/2021

04/07/2021

04/10/2021

04/13/2021

04/16/2021

04/19/2021

04/22/2021

04/25/2021

04/28/2021

05/01/2021

05/04/2021

05/07/2021

05/10/2021

05/13/2021

05/16/2021

05/19/2021

05/22/2021

05/25/2021

05/28/2021

06/01/2021

06/04/2021

06/07/2021

06/10/2021

06/13/2021

06/16/2021

06/19/2021

06/22/2021

06/25/2021

06/28/2021

07/01/2021

07/04/2021

07/07/2021

07/10/2021

07/13/2021

07/16/2021

07/19/2021

07/22/2021

07/25/2021

07/28/2021

07/31/2021

08/03/2021

08/06/2021

08/09/2021

08/12/2021

08/15/2021

08/18/2021

08/21/2021

08/24/2021

08/27/2021

08/30/2021

09/02/2021

09/05/2021

09/08/2021

09/11/2021

09/14/2021

09/17/2021

09/20/2021

09/23/2021

09/26/2021

09/29/2021

10/02/2021

10/05/2021

10/08/2021

10/11/2021

10/14/2021

10/17/2021

10/20/2021

10/23/2021

10/26/2021

10/29/2021

11/01/2021

11/04/2021

11/07/2021

11/10/2021

11/13/2021

11/16/2021

11/19/2021

11/22/2021

11/25/2021

11/28/2021

12/01/2021

12/04/2021

12/07/2021

12/10/2021

12/13/2021

12/16/2021

12/19/2021

12/22/2021

12/25/2021

12/28/2021

12/31/2021

01/03/2022

01/06/2022

01/09/2022

01/12/2022

01/15/2022

01/18/2022

01/21/2022

01/24/2022

01/27/2022

01/30/2022

02/02/2022

02/05/2022

02/08/2022

02/11/2022

02/14/2022

02/17/2022

02/20/2022

02/23/2022

02/26/2022

02/29/2022

03/02/2022

03/05/2022

03/08/2022

03/11/2022

03/14/2022

03/17/2022

03/20/2022

03/23/2022

03/26/2022

03/29/2022

04/01/2022

04/04/2022

04/07/2022

04/10/2022

04/13/2022

04/16/2022

04/19/2022

04/22/2022

04/25/2022

04/28/2022

05/01/2022

05/04/2022

05/07/2022

05/10/2022

05/13/2022

05/16/2022

05/19/2022

05/22/2022

05/25/2022

05/28/2022

06/01/2022

06/04/2022

06/07/2022

06/10/2022

06/13/2022

06/16/2022

06/19/2022

06/22/2022

06/25/2022

06/28/2022

07/01/2022

07/04/2022

07/07/2022

07/10/2022

07/13/2022

07/16/2022

07/19/2022

07/22/2022

07/25/2022

07/28/2022

08/01/2022

08/04/2022

08/07/2022

08/10/2022

08/13/2022

08/16/2022

08/19/2022

08/22/2022

08/25/2022

08/28/2022

09/01/2022

09/04/2022

09/07/2022

09/10/2022

09/13/2022

09/16/2022

09/19/2022

09/22/2022

09/25/2022

09/28/2022

10/01/2022

10/04/2022

10/07/2022

10/10/2022

10/13/2022

10/16/2022

10/19/2022

10/22/2022

10/25/2022

10/28/2022

11/01/2022

11/04/2022

11/07/2022

11/10/2022

11/13/2022

11/16/2022

11/19/2022

11/22/2022

11/25/2022

11/28/2022

12/01/2022

12/04/2022

12/07/2022

12/10/2022

12/13/2022

12/16/2022

12/19/2022

12/22/2022

12/25/2022

12/28/2022

12/31/2022

01/03/2023

01/06/2023

01/09/2023

01/12/2023

01/15/2023

01/18/2023

01/21/2023

01/24/2023

01/27/2023

01/30/2023

02/02/2023

02/05/2023

02/08/2023

02/11/2023

02/14/2023

02/17/2023

02/20/2023

02/23/2023

02/26/2023

02/29/2023

03/02/2023

03/05/2023

03/08/2023

03/11/2023

03/14/2023

03/17/2023

03/20/2023

03/23/2023

03/26/2023

03/29/2023

04/01/2023

04/04/2023

04/07/2023

04/10/2023

04/13/2023

04/16/2023

04/19/2023

04/22/2023

04/25/2023

04/28/2023

05/01/2023

05/04/2023

05/07/2023

05/10/2023

05/13/2023

05/16/2023

05/19/2023

05/22/2023

05/25/2023

05/28/2023

06/01/2023

06/04/2023

06/07/2023

06/10/2023

06/13/2023

06/16/2023

06/19/2023

06/22/2023

06/25/2023

06/28/2023

07/01/2023

07/04/2023

07/07/2023

07/10/2023

07/13/2023

07/16/2023

07/19/2023

07/22/2023

07/25/2023

07/28/2023

08/01/2023

08/04/2023

08/07/2023

08/10/2023

08/13/2023

08/16/2023

08/19/2023

08/22/2023

08/25/2023

08/28/2023

09/01/2023

09/04/2023

09/07/2023

09/10/2023

09/13/2023

09/16/2023

09/19/2023

09/22/2023

09/25/2023

09/28/2023

10/01/2023

10/04/2023

10/07/2023

10/10/2023

10/13/2023

10/16/2023

10/19/2023

10/22/2023

10/25/2023

10/28/2023

11/01/2023

11/04/2023

11/07/2023

11/10/2023

11/13/2023

11/16/2023

11/19/2023

11/22/2023

11/25/2023

11/28/2023

12/01/2023

12/04/2023

12/07/2023

12/10/2023

12/13/2023

12/16/2023

12/19/2023

12/22/2023

12/25/2023

12/28/2023

12/31/2023

01/03/2024

01/06/2024

01/09/2024

01/12/2024

01/15/2024

01/18/2024

01/21/2024

01/24/2024

01/27/2024

01/30/2024

02/02/2024

02/05/2024

02/08/2024

02/11/2024

02/14/2024

02/17/2024

02/20/2024

02/23/2024

02/26/2024

02/29/2024

03/02/2024

03/05/2024

03/08/2024

03/11/2024

03/14/2024

03/17/2024

03/20/2024

03/23/2024

03/26/2024

03/29/2024

04/01/2024

04/04/2024

04/07/2024

04/10/2024

04/13/2024

04/16/2024

04/19/2024

04/22/2024

04/25/2024

04/28/2024

05/01/2024

05/04/2024

05/07/2024

05/10/2024

05/13/2024

05/16/2024

05/19/2024

05/22/2024

05/25/2024

05/28/2024

06/01/2024

06/04/2024

06/07/2024

06/10/2024

06/13/2024

06/16/2024

06/19/2024

06/22/2024

06/25/2024

06/28/2024

07/01/2024

07/04/2024

07/07/2024

07/10/2024

07/13/2024

07/16/2024

07/19/2024

07/22/2024

07/25/2024

07/28/2024

08/01/2024

08/04/2024

08/07/2024

08/10/2024

08/13/2024

08/16/2024

08/19/2024

08/22/2024

08/25/2024

08/28/2024

09/01/2024

09/04/2024

09/07/2024

09/10/2024

09/13/2024

09/16/2024

09/19/2024

09/22/2024

09/25/2024

09/28/2024

10/01/2024

10/04/2024

10/07/2024

10/10/2024

10/13/2024

10/16/2024

10/19/2024

10/22/2024

10/25/2024

10/28/2024

11/01/2024

11/04/2024

11/07/2024

11/10/2024

11/13/2024

11/16/2024

11/19/2024

11/22/2024

11/25/2024

11/28/2024

12/01/2024

12/04/2024

12/07/2024

12/10/2024

12/13/2024

12/16/2024

12/19/2024

12/22/2024

12/25/2024

12/28/2024

12/31/2024

01/03/2025

01/06/2025

01/09/2025

01/12/2025

01/15/2025

01/18/2025

01/21/2025

01/24/2025

01/27/2025

01/30/2025

02/02/2025

02/05/2025

02/08/2025

02/11/2025

02/14/2025

02/17/2025

02/20/2025

02/23/2025

02/26/2025

02/29/2025

03/02/2025

03/05/2025

03/08/2025

03/11/2025

03/14/2025

03/17/2025

03/20/2025

03/23/2025

03/26/2025

03/29/2025

04/01/2025

04/04/2025

04/07/2025

04/10/2025

04/13/2025

04/16/2025

04/19/2025

04/22/2025

04/25/2025

04/28/2025

05/01/2025

05/04/2025

05/07/2025

05/10/2025

05/13/2025

05/16/2025

05/19/2025

05/22/2025

05/25/2025

05/28/2025

06/01/2025

06/04/2025

06/07/2025

06/10/2025

06/13/2025

06/16/2025

06/19/2025

06/22/2025

06/25/2025

06/28/2025

07/01/2025

07/04/2025

07/07/2025

07/10/2025

07/13/2025

07/16/2025

07/19/2025

07/22/2025

07/25/2025

07/28/2025

08/01/2025

08/04/2025

08/07/2025

08/10/2025

08/13/2025

08/16/2025

08/19/2025

08/22/2025

08/25/2025

08/28/2025

09/01/2025

09/04/2025

09/07/2025

09/10/2025

09/13/2025

09/16/2025

09/19/2025

09/22/2025

09/25/2025

09/28/2025

10/01/2025

10/04/2025

10/07/2025

10/10/2025

10/13/2025

10/16/2025

10/19/2025

10/22/2025

10/25/2025

10/28/2025

11/01/2025

11/04/2025

11/07/2025

11/10/2025

11/13/2025

11/16/2025

11/19/2025

11/22/2025

11/25/2025

11/28/2025

12/01/2025

12/04/2025

12/07/2025

12/10/2025

12/13/2025

12/16/2025

12/19/2025

12/22/2025

12/25/2025

12/28/2025

12/31/2025

01/03/2026

01/06/2026

01/09/2026

01/12/2026

01/15/2026

01/18/2026

01/21/2026

01/24/2026

01/27/2026

01/30/2026

02/02/2026

02/05/2026

02/08/2026

02/11/2026

02/14/2026

02/17/2026

02/20/2026

02/23/2026

02/26/2026

02/29/2026

03/02/2026

03/05/2026

03/08/2026

03/11/2026

03/14/2026

03/17/2026

03/20/2026

03/23/2026

03/26/2026

03/29/2026

04/01/2026

04/04/2026

04/07/2026

04/10/2026

04/13/2026

04/16/2026

04/19/2026

04/22/2026

04/25/2026

04/28/2026

05/01/2026

05/04/2026

05/07/2026

05/10/2026

05/13/2026

05/16/2026

05/19/2026

05/22/2026

05/25/2026

05/28/2026

06/01/2026

06/04/2026

06/07/2026

06/10/2026

06/13/2026

06/16/2026

06/19/2026

06/22/2026

06/25/2026

06/28/2026

07/01/2026

07/04/2026

07/07/2026

07/10/2026

07/13/2026

07/16/2026

07/19/2026

07/22/2026

07/25/2026

07/28/2026

08/01/2026

08/04/2026

08/07/2026

08/10/2026

08/13/2026

08/16/2026

08/19/2026

08/22/2026

08/25/2026

08/28/2026

09/01/2026

09/04/2026

09/07/2026

09/10/2026

09/13/2026

09/16/2026

09/19/2026

09/22/2026

09/25/2026

09/28/2026

10/01/2026

10/04/2026

10/07/2026

10/10/2026

10/13/2026

10/16/2026

10/19/2026

10/22/2026

10/25/2026

10/28/2026

11/01/2026

11/04/2026

11/07/2026

11/10/2026

11/13/2026

11/16/2026

11/19/2026

11/22/2026

11/25/2026

11/28/2026

12/01/2026

12/04/2026

12/07/2026

12/10/2026

12/13/2026

12/16/2026

12/19/2026

12/22/2026

12/25/2026

12/28/2026

12/31/2026

01/03/2027

01/06/2027

01/09/2027

01/12/2027

01/15/2027

01/18/2027

01/21/2027

01/24/2027

01/27/2027

01/30/2027

02/02/2027

02/05/2027

02/08/2027

02/11/2027

02/14/2027

02/17/2027

02/20/2027

02/23/2027

02/26/2027

02/29/2027

03/02/2027

03/05/2027

03/08/2027

03/11/2027

03/14/2027

03/17/2027

03/20/2027

03/23/2027

03/26/2027

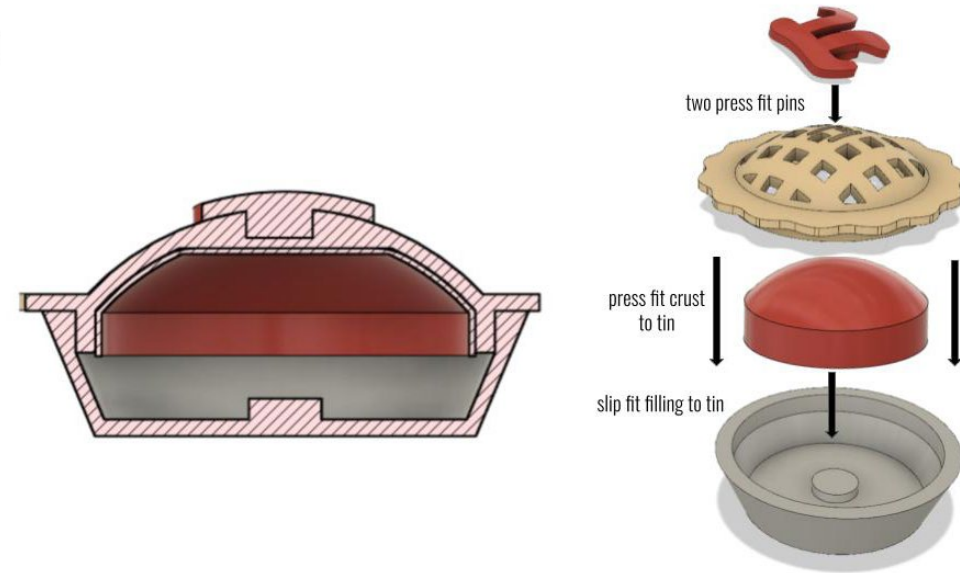
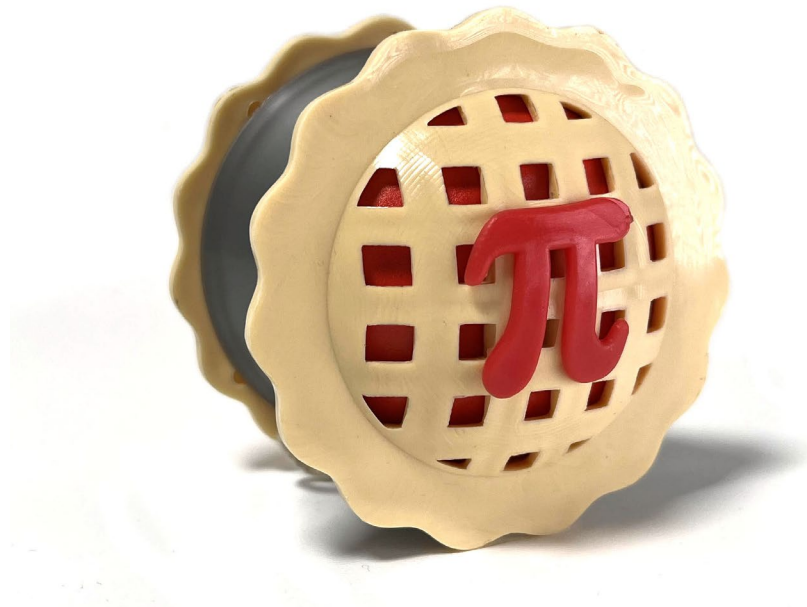
03/29/2027

Pi Pie Yo-yo Fall 2021

A pi symbol themed pie shaped yo-yo designed for mass production

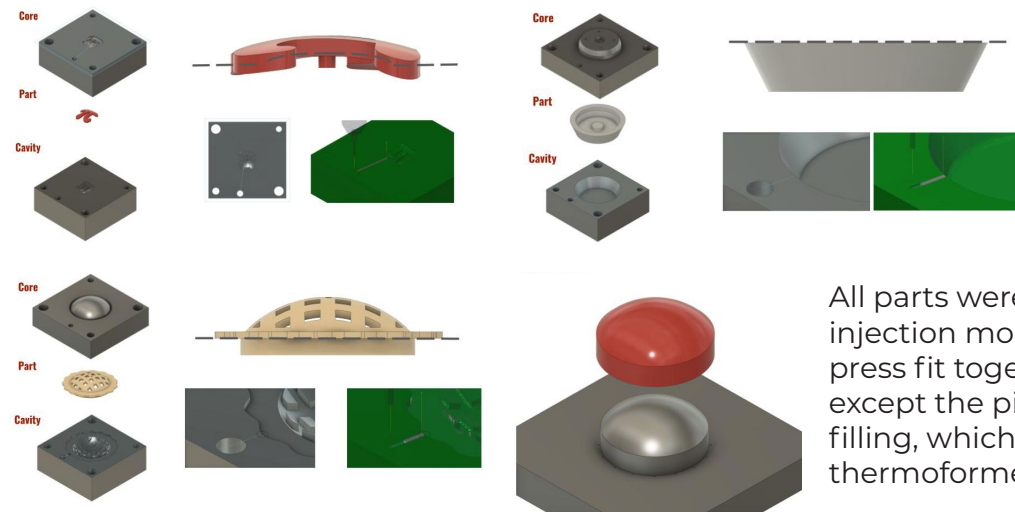
Pi Pie Yo-yo Fall 2021

cont.



For this class we designed this yo-yo and manufactured over 200 units.

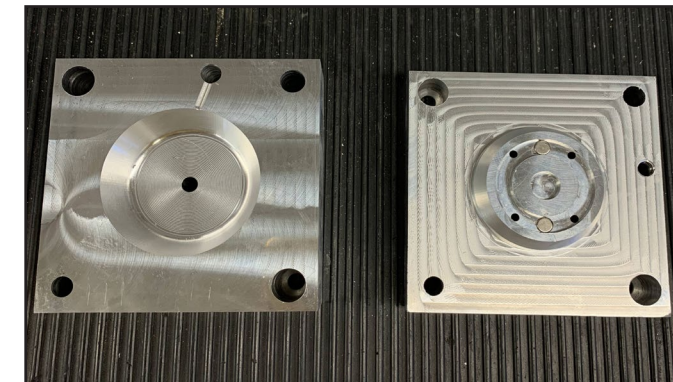
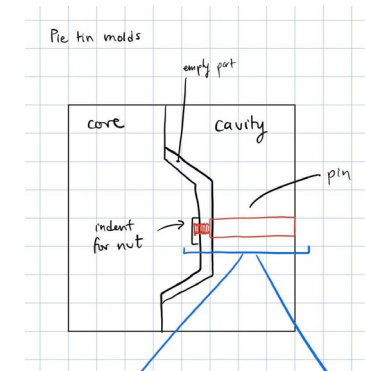
Parts and Molds



Injection Molding and Press Fits



Final Touches



Each yo-yo half includes an overmolded washer for weight, and an overmolded nut in the base to connect the two halves together.

My Role

On this team I did CAD for yoyo parts, planed CAM to mill molds, and 3D printed mold for thermoforming.

Skills Used

- CNC Milling
- Injection Molding
- Design thinking for mass production