
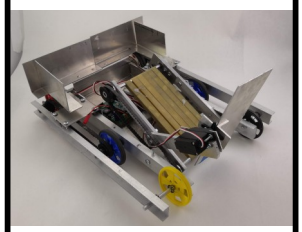


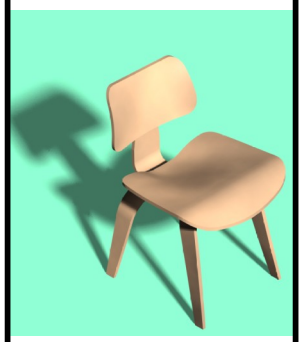
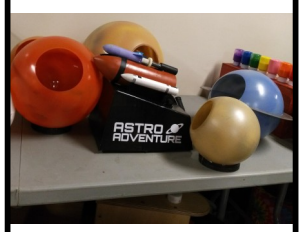


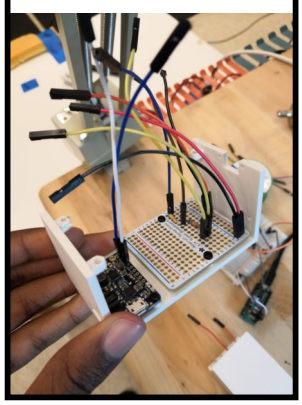

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Portfolio

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https://www.linkedin.com/in/tomad-to/

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Spartan

MIT 2.009 Explorations in Product Design | Sept - Dec 2020

Spartan - for MIT 2.s009 (Explorations in Product Design) by Red team, designed in a team of 16 through user research and testing physical mockups and CAD models, and technical design reviews and presentations. Some renderings were developed in 3DS Max by me. Other tools used by the team and me include Fusion 360, 3D printers, waterjet, laser cutter, CNC mills, sewing machines and more. Sept-Dec 2020,
Product Sheet | 2.s009 website and launch presentations
https://s009kindness.com/images/productSheets/red_spartan_product_sheet_sm.pdf | s009kindness.com

SPARTAN

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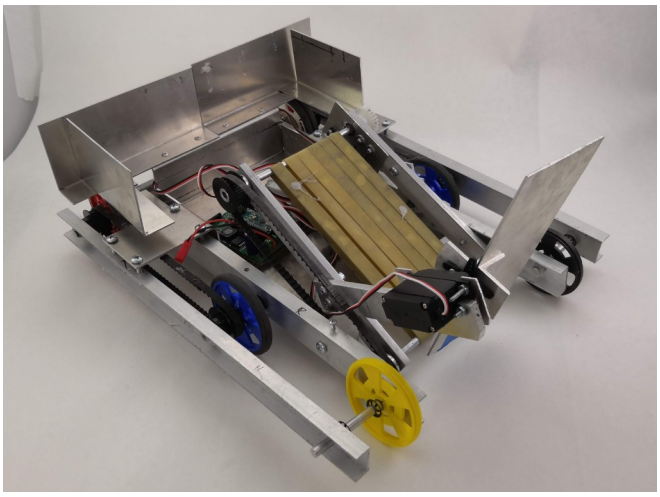
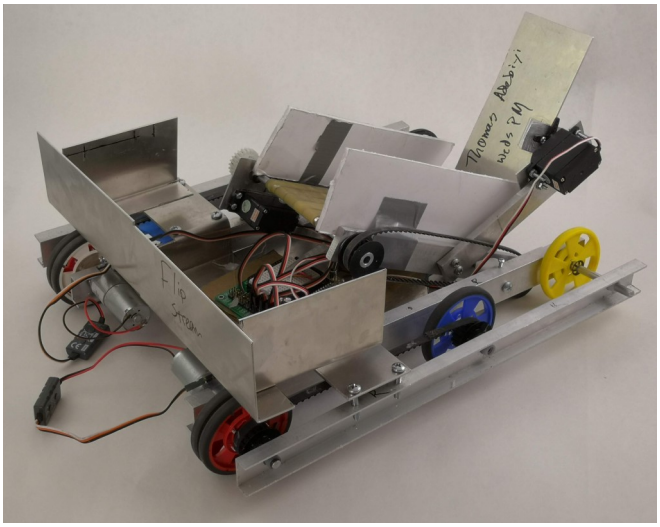
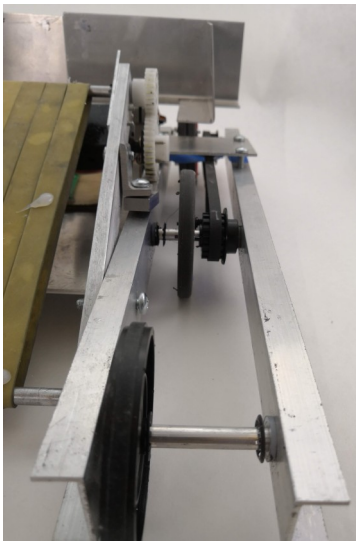
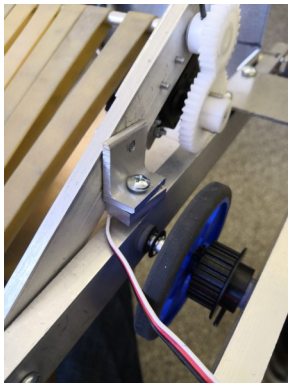
Flipstream

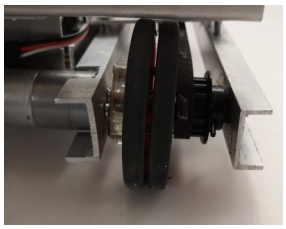
MIT 2.007 Final Competition Robot | Feb - May 2019







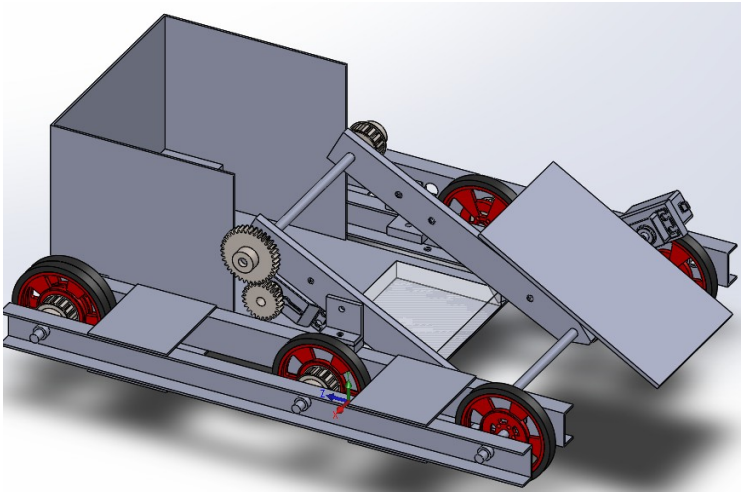


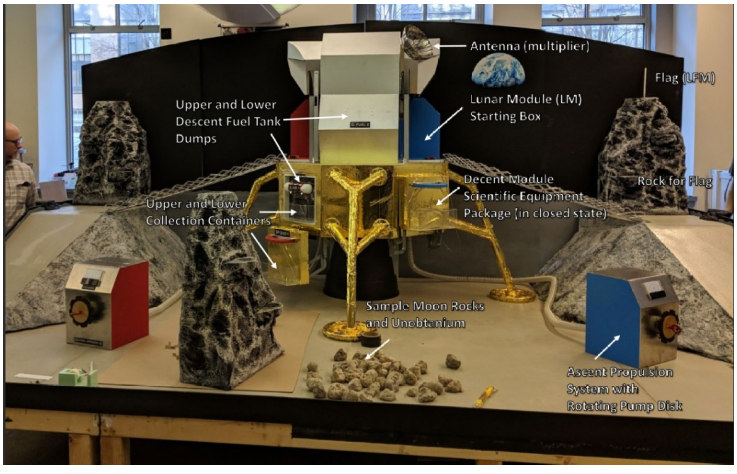


In MIT's class 2.007 "Design and Manufacturing I," each individual student is tasked with designing and building a robot from a kit of parts for a unique competition. The development of the robot was kept in a design notebook. The year's competition was themed around the moon landing.

My strategy for the competition was to plant a flag on one of the levels, descend to the lunar surface and pick up rocks, and then carry them back to the LM starting box. The rotating piece on the front of my robot functioned as both a holder for the flag with which I could rotate down to place on the flag stand and as a mechanism to push moonrocks on to the conveyor belt in the center of the robot. The conveyor belt, made of rubber bands, would move rocks into the back of robot to store them for the ride back up to the starting box.

My robot was made out of aluminum, and I used mills, drill presses, band saws, and various other metalworking tools to fabricate it after designing it in CAD.





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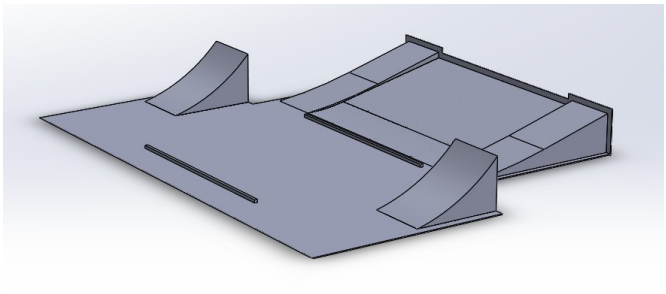
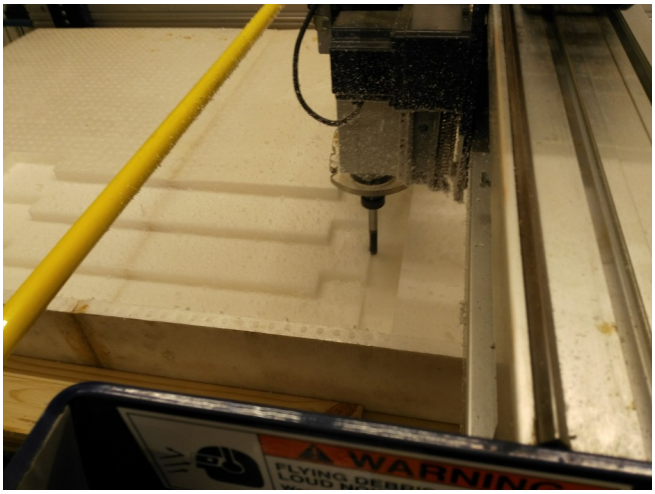
Aero Subteam

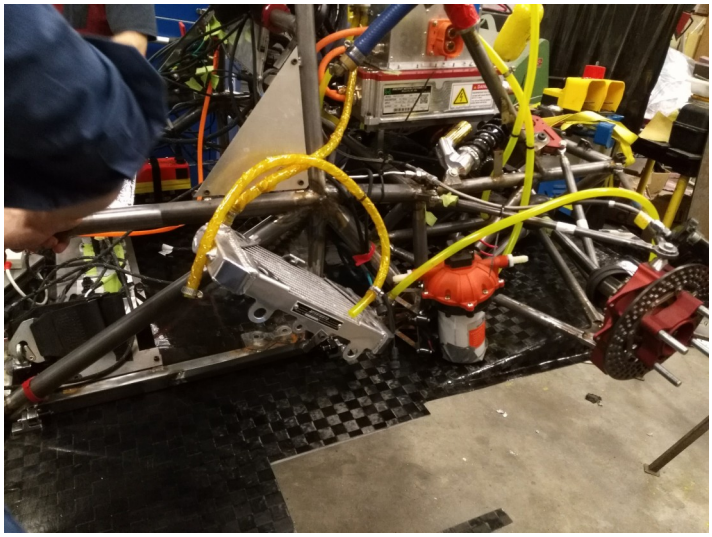
MIT Motorsports Formula SAE Electric Team | Sep 2017 - Jun 2018

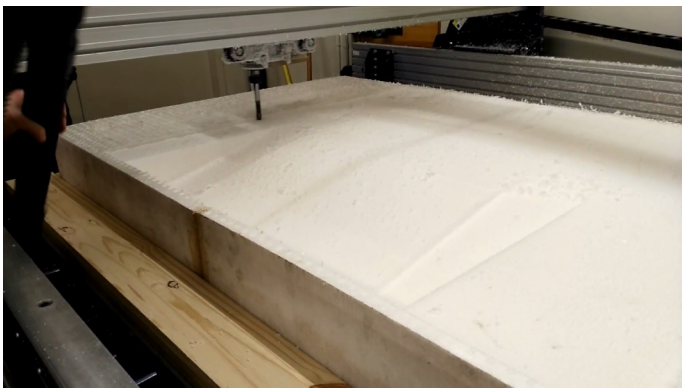


On MIT's Formula SAE team, I worked on the Aerodynamics subteam for the 2018 car "MY18." I primarily was involved in designing and manufacturing the diffuser, an under-body aero device, and I participated in the manufacture of all parts of the aero package. Ultimately, the diffuser was not run at competition due to unforeseen handling issues. We had very limited CFD resources during the design process so we could not catch the issues earlier.

The diffuser was composed of 2 sheets of carbon fiber with structural foam in the middle prepared using a wet layup technique. We created molds for all parts of the package, and, in particular, for the diffuser, we created a very large foam mold carved with a CNC router and finished with a glass bead/epoxy solution.







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Analyzing Player Improvement in Rhythm Games

MIT 2.671 (Measurement and Instrumentation) Project | Sep - Dec 2019

Player Improvement in Rhythm Games

Thomas Adebiyi
2.671 Measurement and Instrumentation
Massachusetts Institute of Technology

3 Experimental Design

Osu! is primarily played on PC/Mac/Linux and the inputs are transferred via a keyboard for tapping and a drawing tablet or mouse for aiming. The setup can be seen in Figure 7. It is composed of a Windows PC, an XP Pen G640 drawing tablet for translating hand movements to x-y aim on the screen and a mechanical keyboard with Outemu Brown switches for tapping inputs. The osu! client provides a replay file that tracks all the movements of the cursor and all the tap timings in milliseconds. This data can be made human readable after being parsed by external community-made software.

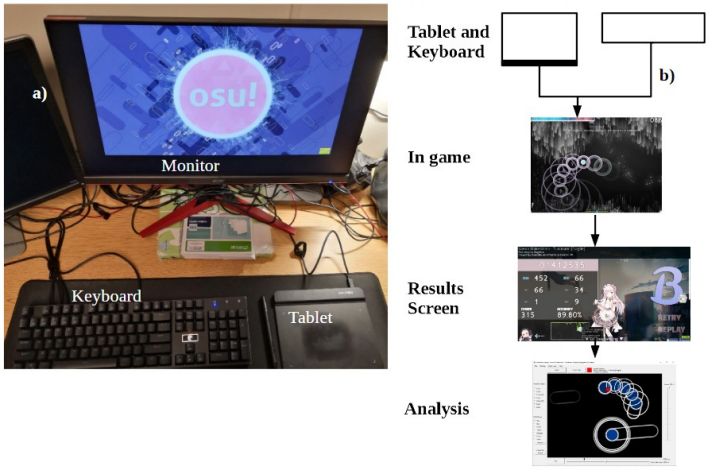

Figure 7: a) A picture of the setup used for experiments. The tablet is used for aiming at objects, and the keyboard is used for tapping on them. Objects appear on the monitor in time with music. b) Flow chart of data collection and analysis process. Data from the play as a whole is available on the results screen after completing the map. This can then be used to run analyses in Excel and MATLAB.

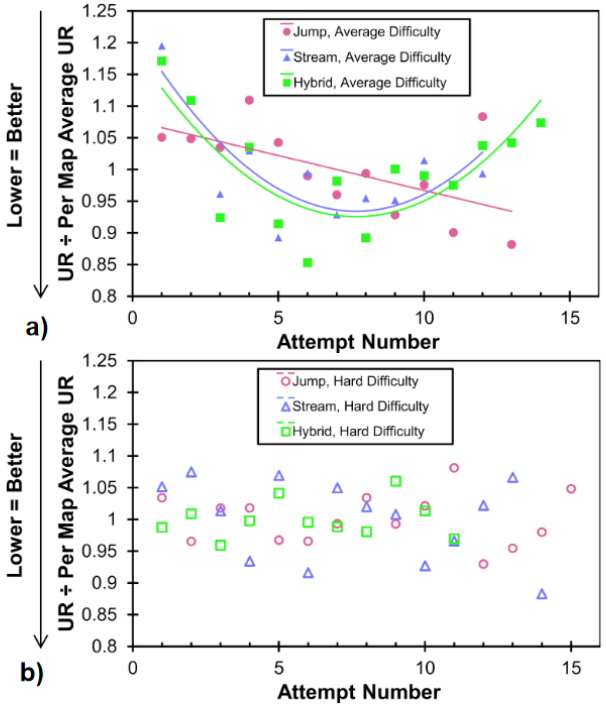

Figure 8: Plot of unstable rate divided by the average unstable rate across all attempts on one map versus the attempt number on each map. 8a shows all of the average difficulty maps and 8b shows all of the hard difficulty maps. The division was done to put all the data on the same scale across maps while preserving the data shape from the raw data. The maps with statistically significant fits had their fit lines plotted. The plot shows a rough trend in change in UR over time. Some of the fits show that some attempts reach a minimum within attempts 5-10 which is upwards 26% lower than the first attempt before leveling out or trending to an increase in UR, while the average difficulty jump map is has a linear fit, indicating that streams and burst are more fatiguing physically.

Analyzing Player Improvement in Rhythm Games - for 2.671 (Measurement and Instrumentation) "Go Forth and Measure" research project, (data analyzed in MATLAB and some custom community-made tools, plots developed in MS Excel) Sept-Dec 2019, Final Report | Poster
https://tomadto.s-ul.eu/osu-paper/1kNA1Y7Y | https://tomadto.s-ul.eu/osu-paper/mfsMpV7e

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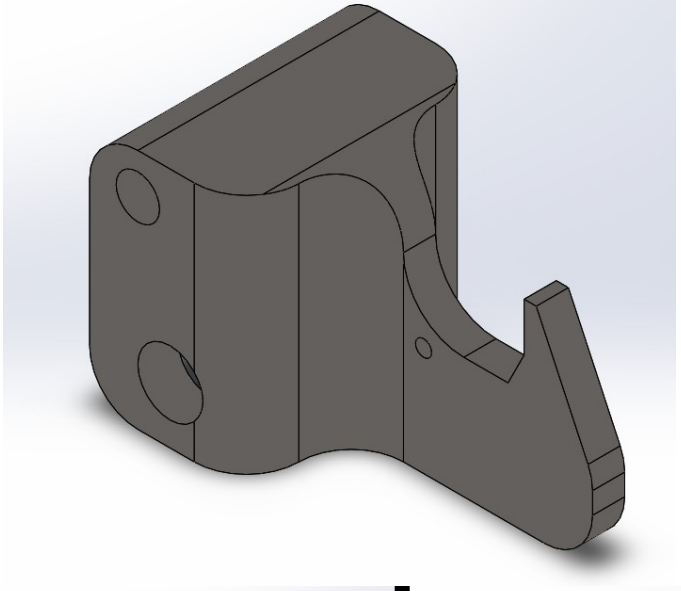
Astro Adventure

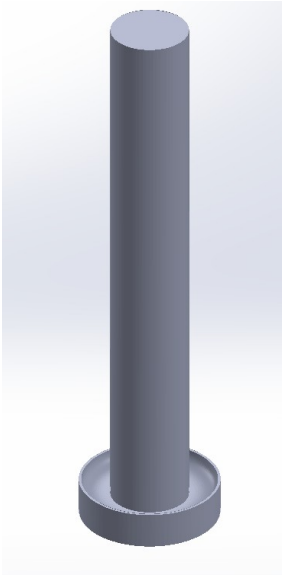
Toy Product Design (2.00B) final project | Feb - May 2018

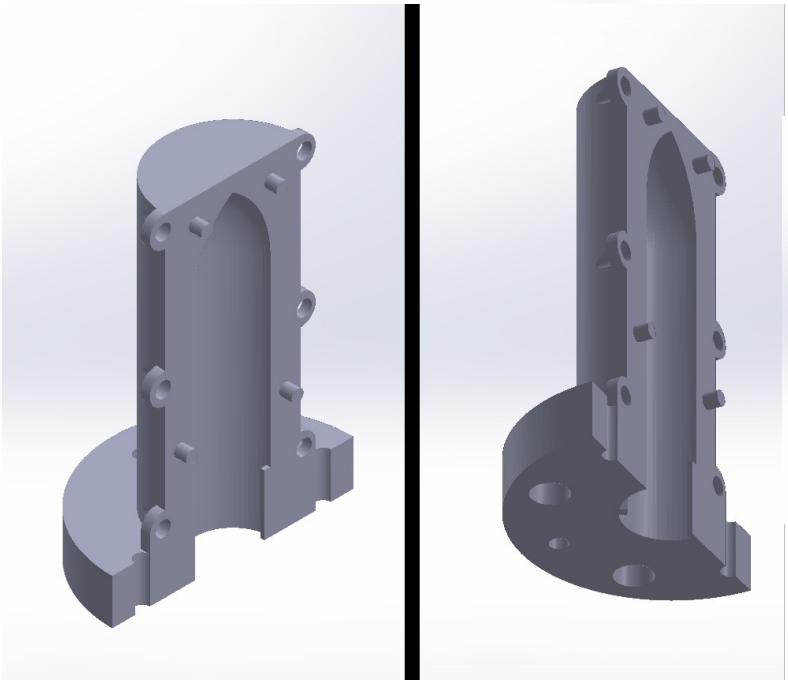
Launch rockets to planets scattered ahead of the rocket-launching platform. Be the first to land at all the planets to win!

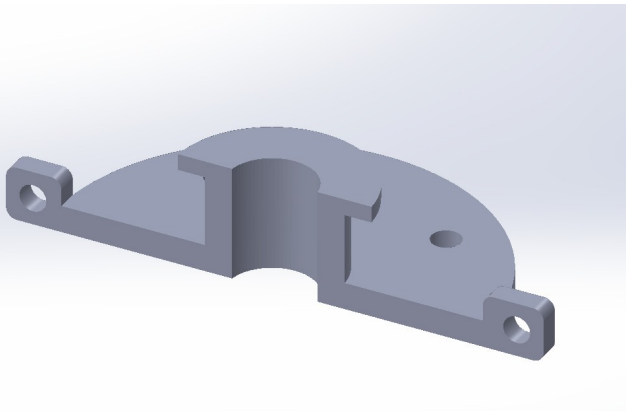
The launching platform is composed of a thermo-formed angled base mounted on top of a turntable and the center booster section can be pitched independent of the base, allowing the player to aim their rocket in 2 axes. The rocket is loaded by compressing the spring and launched by pulling and releasing the trigger.
The rocket itself is made out of expanding foam (*Smooth-On*) cast into shape using various 3d-printed parts made in Solidworks. The inner tube remains in the rocket and interacts with the trigger. When the rocket is loaded, the lip at the end of the inner tube holds the trigger in place until launched.



Left: Trigger
Right: Positive part of rocket mold
Bottom Left: Negative parts of rocket mold
Bottom Right: Mold endcap







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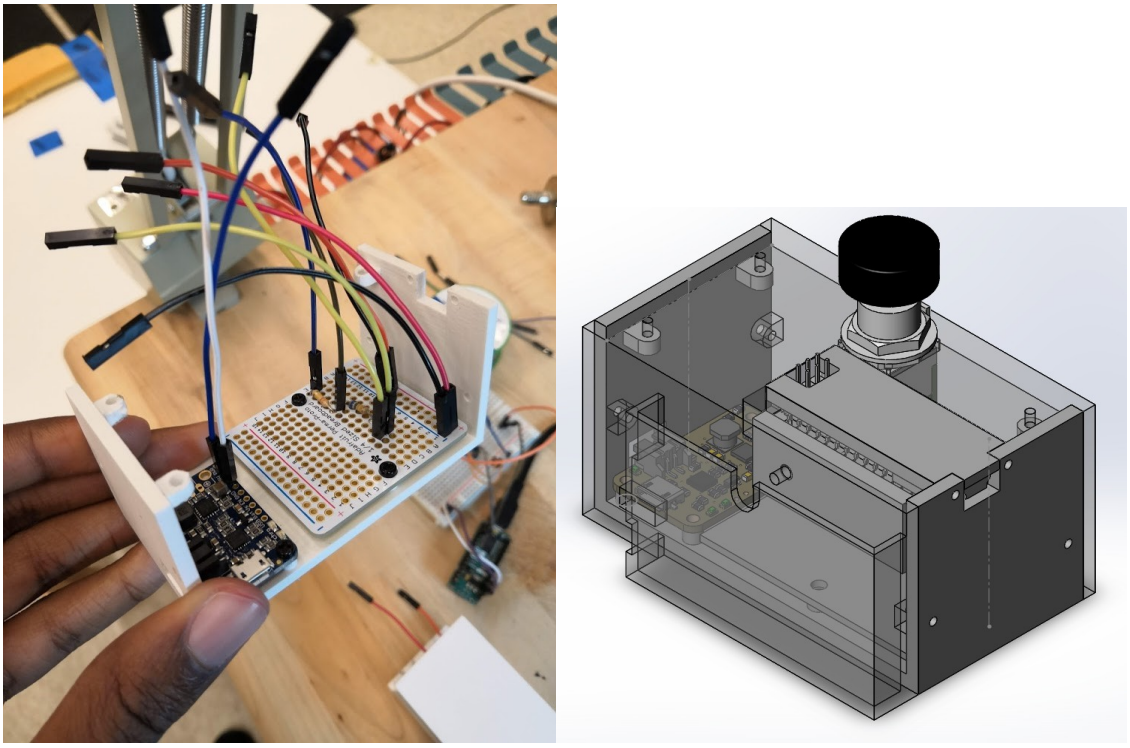
Projects

Eames Dining Chair - orig. by Charles and Ray Eames, for 4.500 (Design Computation), Sep 2019, designed in Rhinoceros 6, middle image rendered in 3DS Max



Button Box - for spacesuit glove UROP (undergraduate research), Jul/Aug 2019, designed in Solidworks

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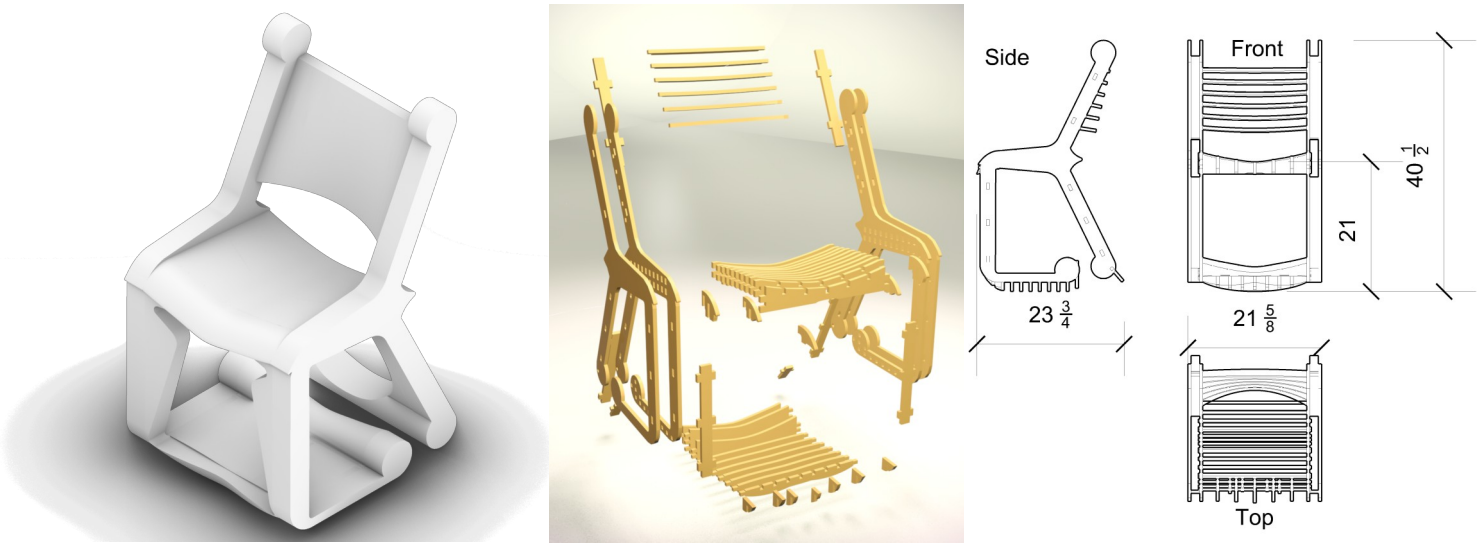
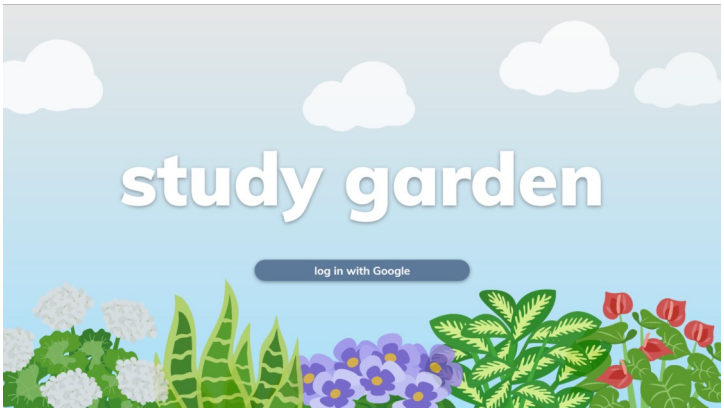
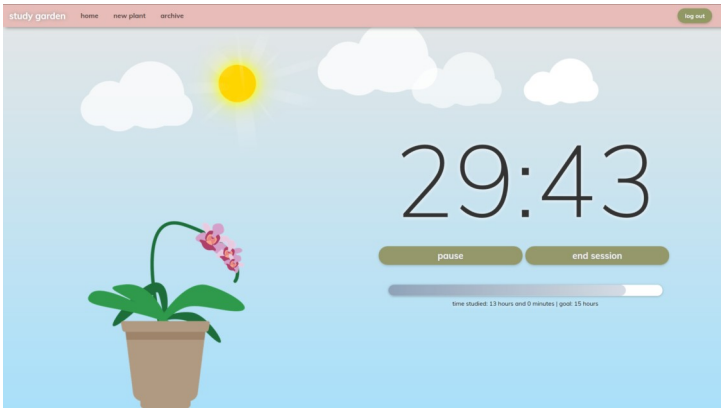
Projects



Custom Chair - for 4.500 (Design Computation), Nov-Dec 2019, designed in Rhinoceros 6, middle image rendered in 3DS Max





Study Garden (*study-garden.herokuapp.com* | *https://github.com/tomadto/studygarden*) - a study tracking website where plants grow as the user spends more time studying.
For web.lab (*weblab.mit.edu*), Jan 2020, developed using HTML + CSS and JavaScript + React for the frontend, Express.js and Mongoose + MongoDB for the backend, used Adobe XD for wireframing.
Worked in a team of 3, personally responsible for all of the backend and parts of the frontend functionality and CSS, particularly on the study page. Site was a semi-finalist and so the team presented in front of industry professionals!