This project was a design exploration of the human scale, with an emphasis on proportions and rhythms. As part of an introductory design class, the project began by taking ten length measurements of various parts of my body along with the corresponding range of motion each measured part. The inch and degree measurements were then used to construct a length of steel wire with lengths and angles proportional to the ones measured on the body.

Next the outline of the wire was projected three times from different distances and at different angles. The resulting image was then the base for constructing a three dimensional model out of museum board with the thickest material representing the largest projection, and only a small strip representing the thinnest. My structure was constructed so that when two elements crossed paths, the one that was on top in the drawing was also on top in the model, creating a dynamically intertwined shape that is an abstraction a body moving in space.
Swing Gazebo

This project was a design for a shelter in a geometric modeling and computation class. I have a gazebo made of bamboo-like wood with swing seating, and inset lighting, set to overlook the Charles river in Boston. Through this project, I learned how to 3D model and render scenes.

For the second part of this project, I 3D printed for the first time using powder. This physical section of the gazebo gave me a better sense of the shape and structure of my project.
Transforming Cube

I began this project by taking length measurements of my body in space while doing three sets of basic yoga movements with three positions each. All the measurements were taken to show the relationships between torso, hands and feet, with a focus on balance. Those measurements were then scaled down and drawn on a grid, creating an abstraction of the position.

Each set of gridded squares then became a side of a cube with multiple sections, designed to expand, contract and transform in a way that embodied the idea of the movement.

After many iterations in foam and wood at different scale, the final product was a 9in x 9in bass wood cube that was able to move and rotate to form numerous different configurations that are an exploration of shape and balance.
Long Span Roof

Coming out of a class on structures design and engineering, this long span roof proposal was a design project driven and defined by structural concepts and funicular forms.

The concept behind this structure is a series of seven arches asymmetrically collecting in the center with a compression ring and a steel cable net stretched between the arches to join the seven arches and counteract the tension of the cables. On top of the cables is a network of translucent and curved plastic panels that provide some shade while maintaining natural lighting.

This was a partner project with Sofie Belanger (MIT '17)
This project was centered around exploring new materials and ways of creating structure. I constructed a dodecahedron frame in two pieces that was used to loop string following specific rules to form many three-dimensional shapes that highlighted the relationships between the different edges. Once strung, the strings were coated in superglue, left to dry, and then cut from the frame. The resulting objects were stiff but had varying levels of flexibility and stability. Some could hold weight without buckling, others were easily compressible and expandable, like a spring.

It was an interesting study of how forms created in tension could stand up in compression and survey of the factors, such as number of notes and lengths of string, that lead to such significant structural differences.
Grow Blocks

This project was a modular hydroponic system designed for a product design and creative prototyping class. I designed a flexible, modular hydroponic system with parts that could lock together and reconfigure to provide flexibility and simplicity to small-scale hydroponic growing system.

The electrical, plumbing, and nutrient systems are all built into the modular blocks that make up the frame, and the modularity aspect allows the system to grow taller and wider as plants grow, or different plants are grown, or a higher quantity is wanted. Furthermore, the system can be reconfigured to account for five different hydroponic growing methods: deep water culture, aeroponics, drip irrigation, nutrient film technique, and ebb and flow. Three pieces were then 3D printed at scale to demonstrate the interlocking concept.

This kind of product would be ideal in an educational setting where transparency, flexibility, and hands-on making aspect of the system would be most appreciated.
Rayampampa Stove Project

Started as a project through an international development lab at MIT, I was able to travel to Rayampampa, Peru in January and August/September of 2015 to work with a rural community of sustenance farmers living in a very high-altitude region of the Andes. On the first trip, indoor air quality was identified as a major concern due to large amounts of smoke and carbon monoxide from their wood-burning cookstoves. On both trips and throughout the year I worked with members of the community to design and implement improved cookstoves that reduce smoke and fuel usage to improve the health of the families.

We designed two different types of stoves, one using rocket stove concepts and one using a chimney. Both models of stove have three burners and are designed to fit in as seamlessly as possible into the way that the women already use their current stoves. Additionally, the stoves used only natural and cheap, locally available resources. In addition to building prototype stoves, while in Peru we held workshops with community members on how to modify the design to fit into their home and cooking practices, with an emphasis on the design cycle that can be applied to other challenges as well.

Project was completed with Sade Nabahe (MIT '17) and help from the MIT D-Lab team.
I had an internship with ReMaterials, an Indian social enterprise that makes a modular roofing system, ModRoof, for families in slums and villages. With ReMaterials, I worked with the team on the design of Modroof, installation process, marketing strategies, graphic materials, and more.

Modroof is...

- **Durable** — ModRoof panels are made to be strong, waterproof, fireproof, and long-lasting, which improves safety and decreases maintenance.

- **Comfortable** — ModRoof homes are cooler in the summer, dry and quiet in monsoon season, and overall higher-quality living spaces all year round.

- **Affordable** — ModRoof is low-cost due to its readily available materials, simple manufacturing process, easy-to-install panels, and micro-finance partners.

- **Sustainable** — Panels are custom manufactured from recycled agricultural and packaging waste, sourced locally, and produced locally in Ahmedabad, India.

Work was done as part of the ReMaterials Team.