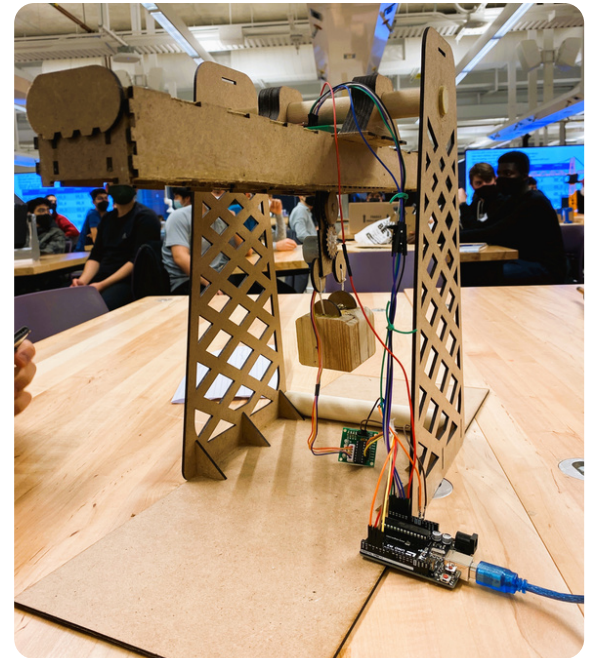
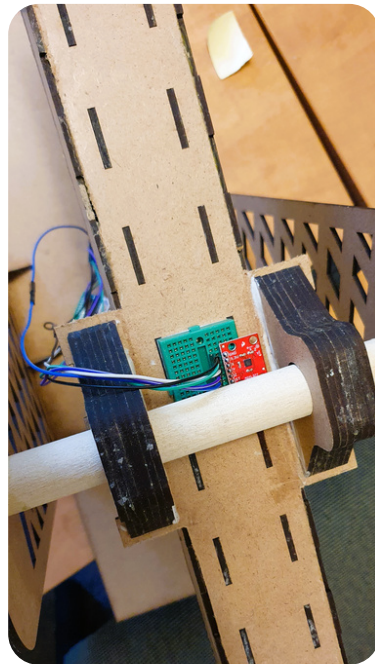
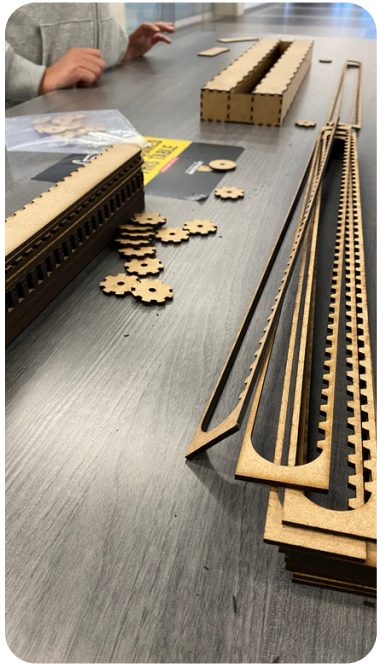
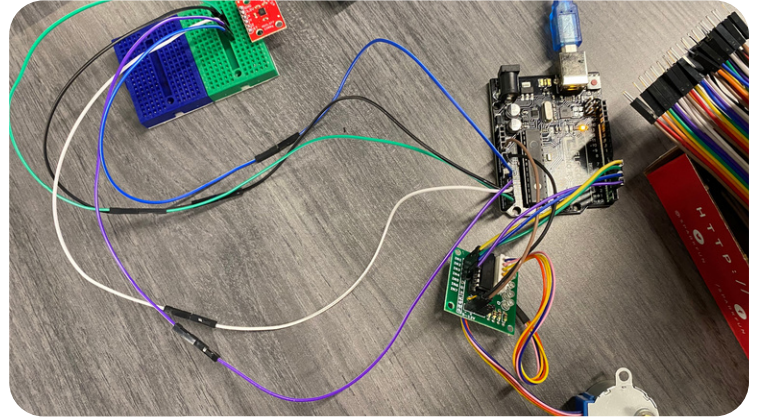
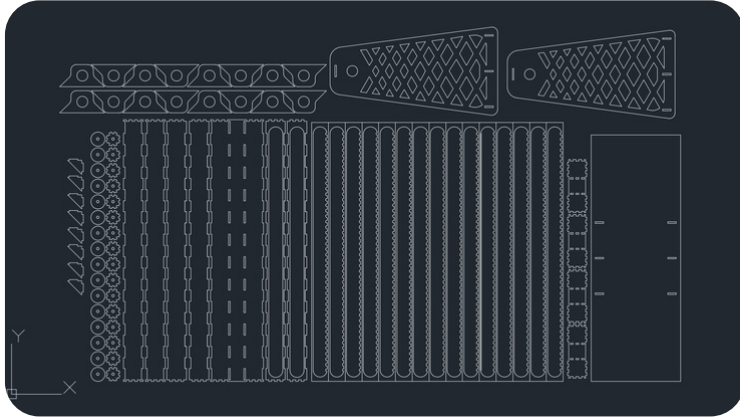


BALANCE TOY



What?

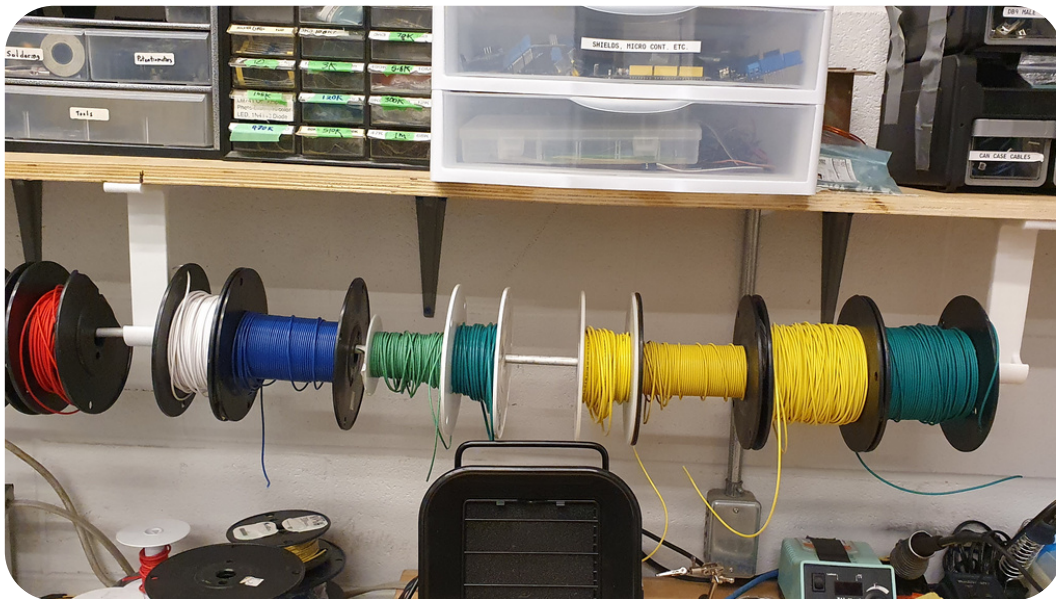
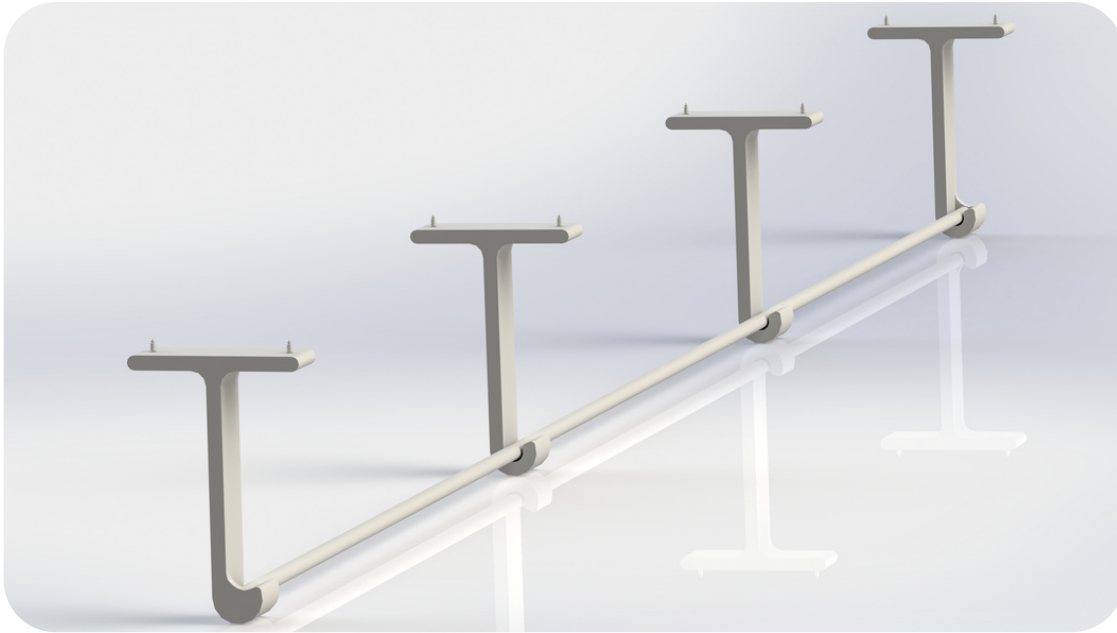
- Design and prototype a toy whose main goal is to unbalance the beam, while the user constantly tries to balance it using pieces of wood
- Primarily responsible for all the electronics used in this project
- Designed few of the CAD drawings
- Was one of two members who was tasked with assembling the different components and final refinements

How?

- Used **AutoCAD** to design the side supports which were laser cutted
- Used **Arduino** to control stepper motors and an accelerometer to check balance
- The monkey (woodblock) moves by a rack and pinion system

Results

- The toy was a success resulting in our team being one of the few teams having a successfully completed prototype
- It can be further improved by implementing better cable management, using more powerful DC motors



What?

- Design a new wire spool rack for the UWAFT Vehicle Garage that enables easier access and replacement of spools when needed

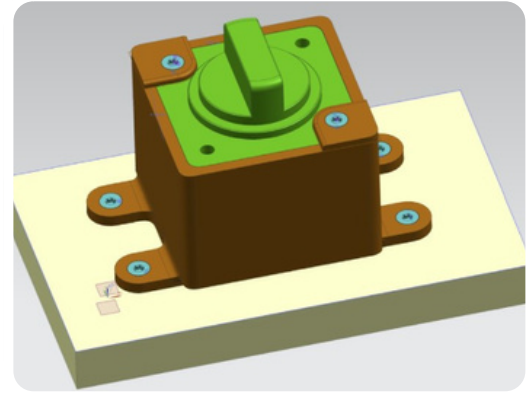
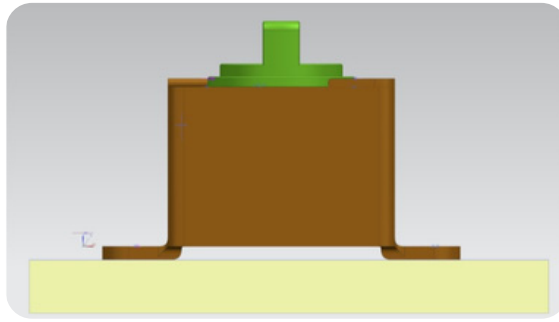
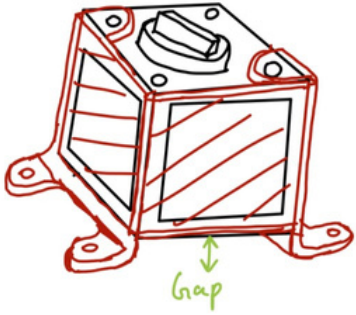
How?

- Used **SolidWorks** to model the individual hooks for the rack
- A SolidWorks Assembly was made to check the fit of all the components
- Hooks were 3D printed in PLA using an in-house Ender 3 printer
- Aluminum rod was passed through the spools to hold it in place

Results

- This design allows the Aluminum rod to be lifted from the support hooks easily when the spools need to be replaced
- Spools can be spun about the rod when wire needs to be taken for use
- Storing wire spools in such a way keeps them organized

SWITCH MOUNT UWAFT



What?

- Being a University of Waterloo Alternative Fuels Team (UWAFT) member, I was asked to design a mount for a switch as part of a CAD challenge
- The mount must enclose the open panels
- Should be able to manufacture it in a cost efficient way.

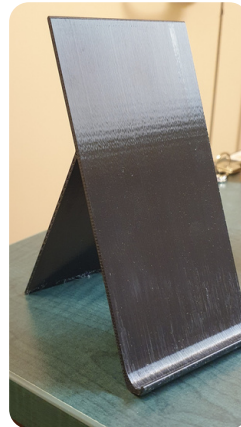
How?

- Used **Siemens NX** to model the mount
- Suggested **3D printing** as the best way to manufacture this enclosure

Results

- Provided a solution that offered good structural support while at the same time minimized screw usage
- The design was able to accomodate cable management and heating issues with the help of a unique spacing between the switch and the wall

CELL PHONE STAND



What?

- Design and 3D print a cell phone stand with efficient material usage as a top priority

How?

- Used **SolidWorks** to design the stand which was then **3D printed** in ABS
- Used **GrabCAD Print** to calculate expected model and support material

Results

- Reduced material usage by orienting the stand such that it reduces the amount of support material needed while printing
- Adding another support structure would reduce deterioration of the support joint from continuous loading