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Brief Mechanical Design Portfolio

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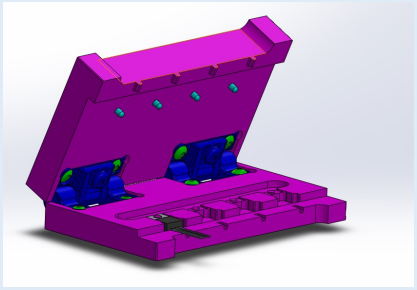
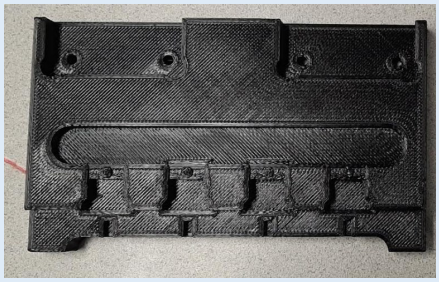
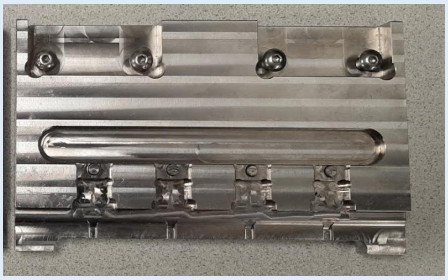
INTERNSHIP PROJECTS:

Below are a couple of the design projects I worked on during my internship at Celestica

Transistor Lead Bending Press Tool — Celestica







Design Problem:

- To design a tool which would bend the leads of a the transistor to a specific angle.
- Created multiple different designs using SolidWorks before settling on this one.

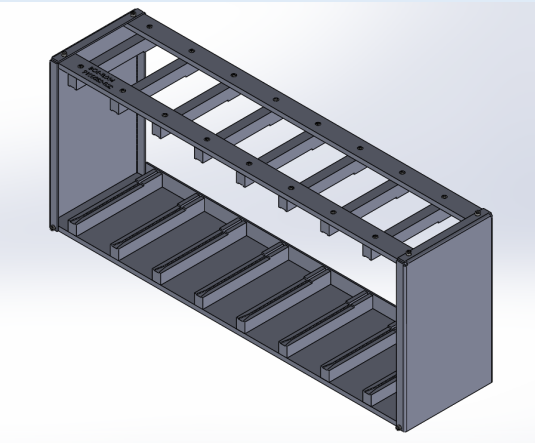
Prototype:

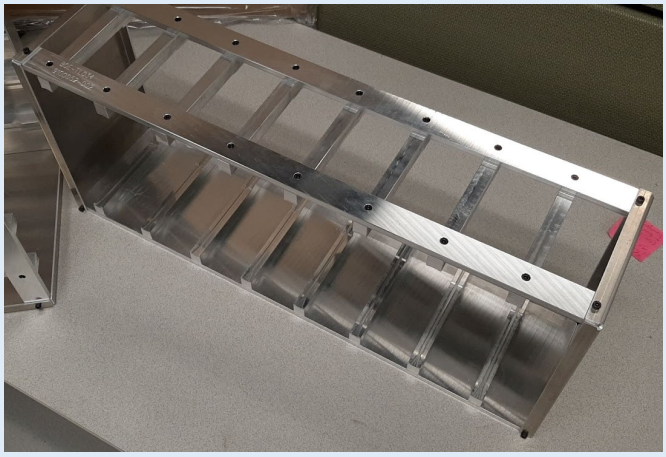
- Created 3D-printed rapid prototypes for both the top and bottom plate (only the bottom plate is shown above) to test the fit of the transistor.
- Allowed for the early discovery of any design flaws.

Result:

- The final design was made out of tooling steel and was machined using CNC.
- The final tool was able to accurately bend the leads of the transistor in accordance to customer specifications, reducing product defect rates.

PCBA Thermal Test Holding Rack — Celestica





Design Problem:

- To design a tool a rack using SolidWorks which would hold specific PCBs while undergoing thermal testing.
- Created different variations depending on the general PCB shape.

Prototype:

- Used 3D-printers to prototype the slots where the PCB would fit into. This allowed for the fit to be verified prior to ordering the final design iteration.

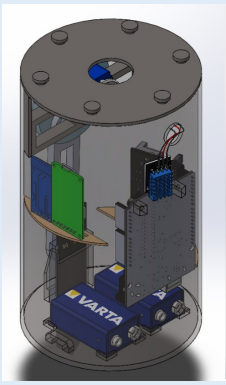
Result:

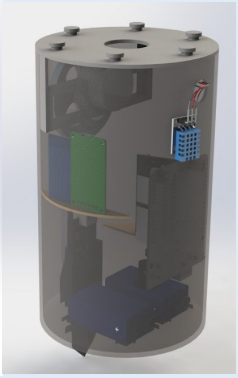
- The final design was made out of aluminum. The rack was able to hold 8 cards and reduced the chances of components being knocked off at thermal testing.
- Resulted in an overall annual savings of an estimated $40,000.

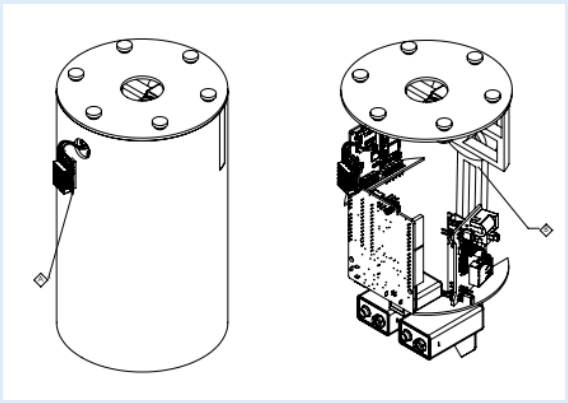
SCHOOL DESIGN PROJECTS:

Below are a couple of the design projects I worked on during my studies at Ryerson University

Agricultural Drone Sensor Module — TMU







Design Problem:

- To design a module which would attach to the bottom of a drone and would carry a payload which consisted of a ground moisture sensor, a temperature/humidity sensor, and a UV light sensor.
- The ground moisture sensor had to be deployable using a mechanism.

Drafted Engineering Drawings:

- Utilized SolidWorks to draft engineering drawings which would aid in fabricating all of the components required to assemble the module.

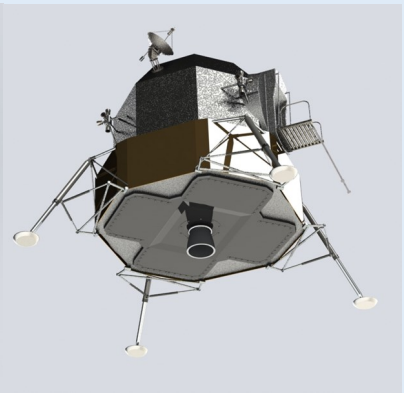
Rendered CAD model:

- Well versed in choosing the proper render settings to get a good idea of what the final design would look like.

Result:

- The final prototype was able to deploy the ground moisture sensor into soil and accurately read the soil moisture.
- The UV light, temperature, and humidity sensors each delivered accurate environment data to the ground station wirelessly.
- A MATLAB GUI was built to display the data on the ground station laptop in real time.

Mars Lander CAD (Space Systems Design Project) — TMU



Concept Design:

- Designed and rendered a concept for a Mars lander. The assembly consists of over 15 main components which would be included in a Mars Ascent Vehicle (MAV).
- The model was used to showcase the various systems (communications, structural, propulsion, etc) which comprise an interplanetary ascent vehicle, such as a MAV.