CAD Portfolio

Grant Goulart

Includes Internship, Class, and Personal Projects

Find all CAD documents for this project in the GitHub repository:
GitHub Repository
(Full assembly file excluded due to size limitations; see images below.)

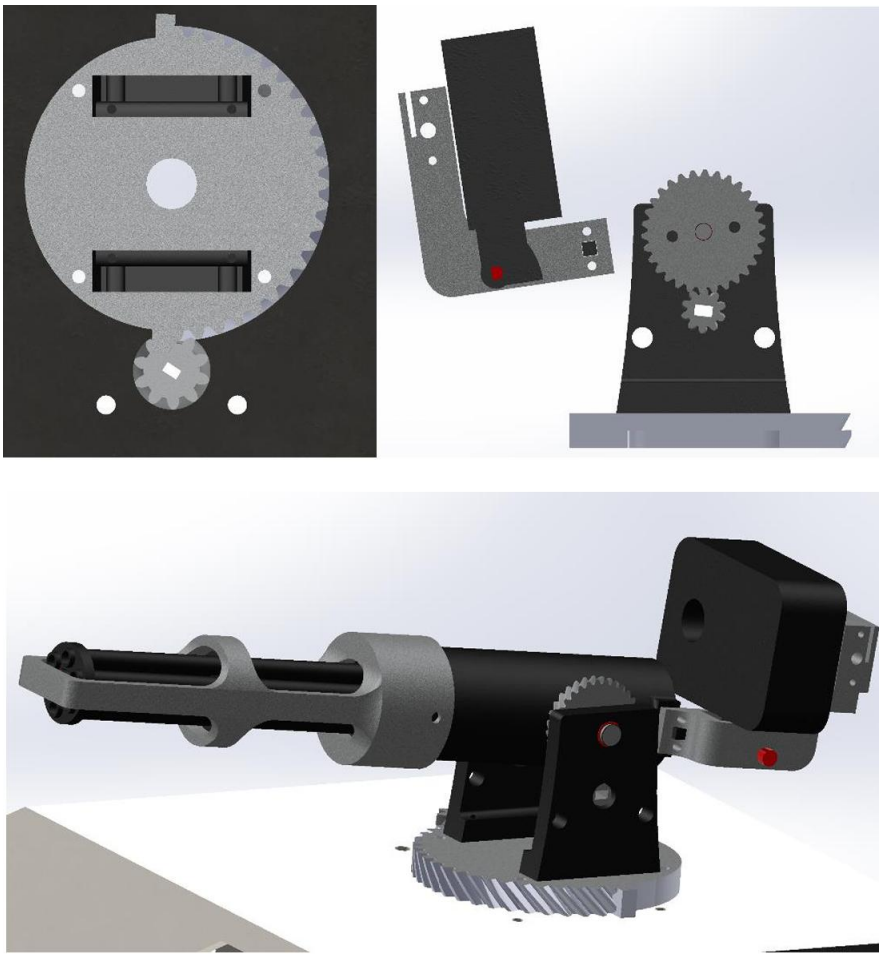

Figure 1: Laser Modulator Assembly

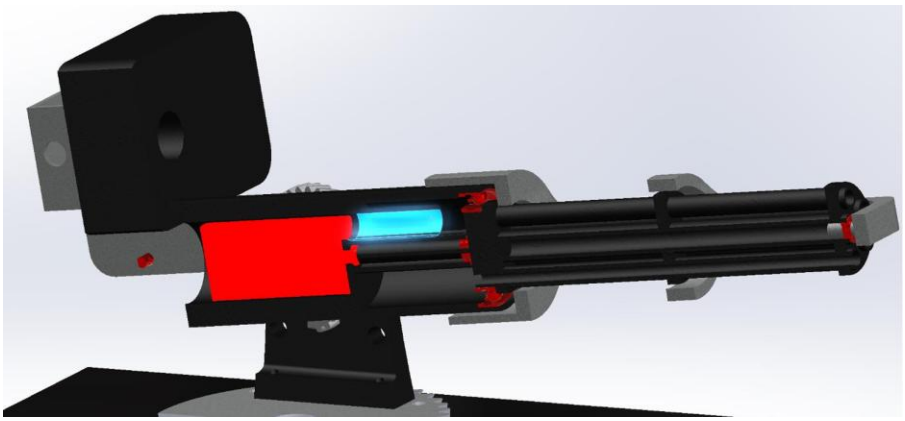

Figure 2: Section View of Laser Modulator

The primary focus of this project was designing and 3D printing a pan-and-tilt system to modulate a laser at preset frequencies, complete with live video feedback for the operator. In Figure 2, the red-highlighted component is the motor that spins the modulator (shown in detail below), while the blue highlight indicates the laser diode.
For a full project overview, please visit the “Projects” section of my LinkedIn:

[Grant Goulart's LinkedIn Profile]

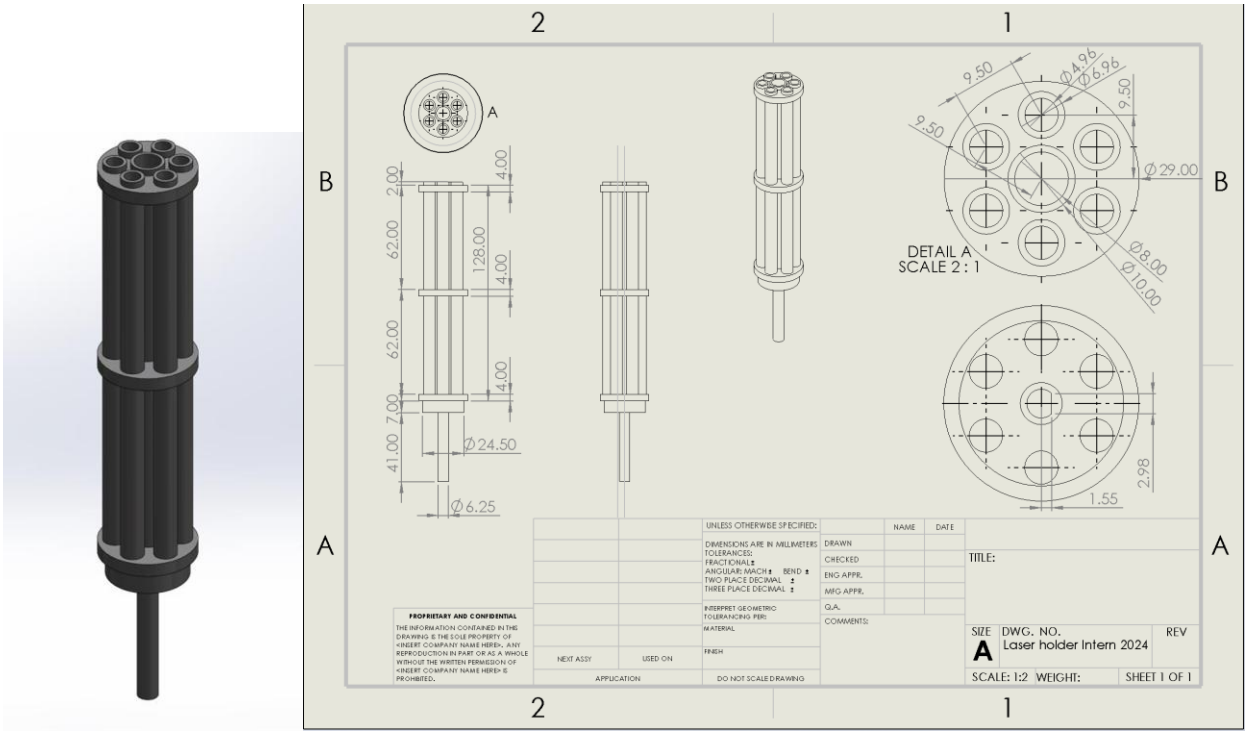

Figure 3: Laser Modulator Drawing

Rather than modulating the laser electronically through software-driven PWM, I designed a rotating mechanical cylinder—similar to a Gatling gun—to mechanically induce

the modulation. As the modulator spins, a carefully spaced pattern of openings and solid sections allows the laser to pass through at exactly a 50% duty cycle.

Engine Manifold

Class project to design an engine manifold within given parameters. I used sweeps to create most of the part, enabling me to efficiently simulate multiple designs.

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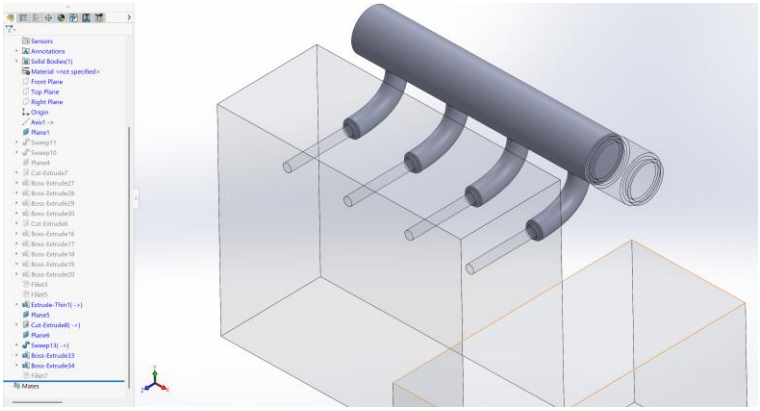

Figure 4: Engine Manifold

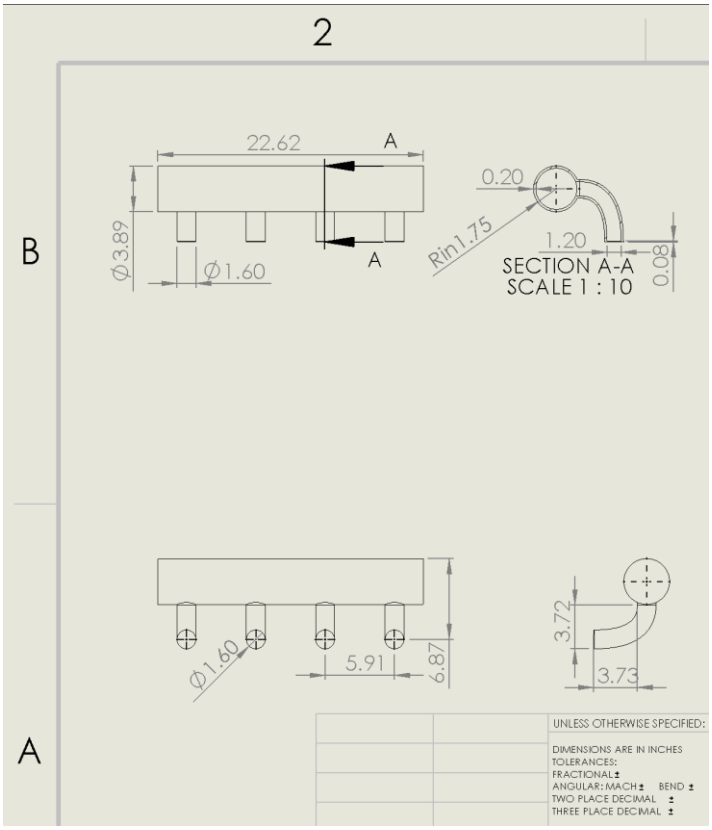

Figure 5: Engine Manifold Drawing

Five Intersecting Tetrahedra

Personal project imitating an origami model. In order to accurately assemble the model in SolidWorks with the proper mates, I sketched a 3D wire-frame dodecahedron with an equation driven side length.

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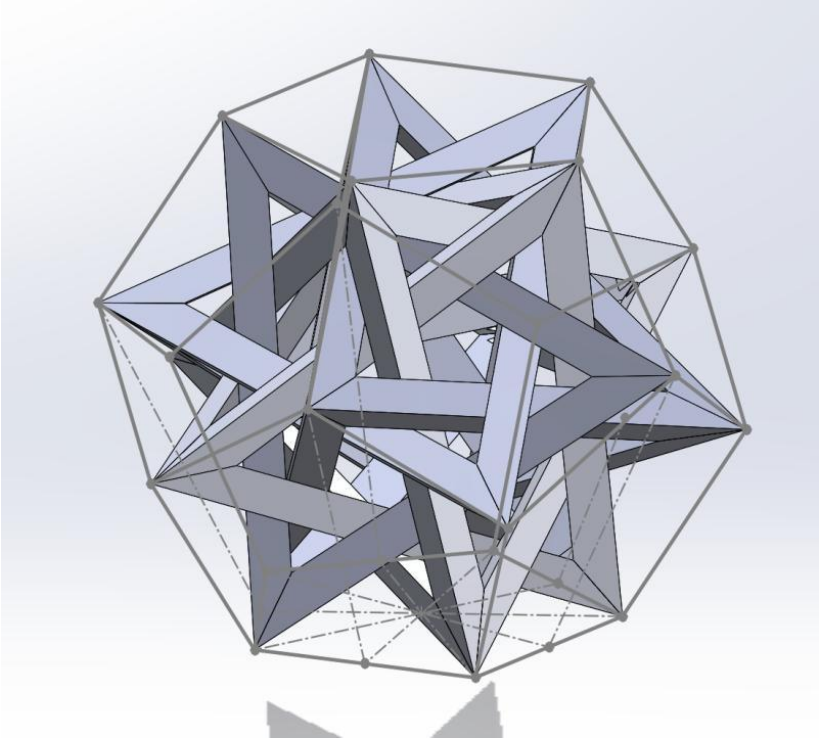

Figure 6: 5 Intersecting Tetrahedra Assembly

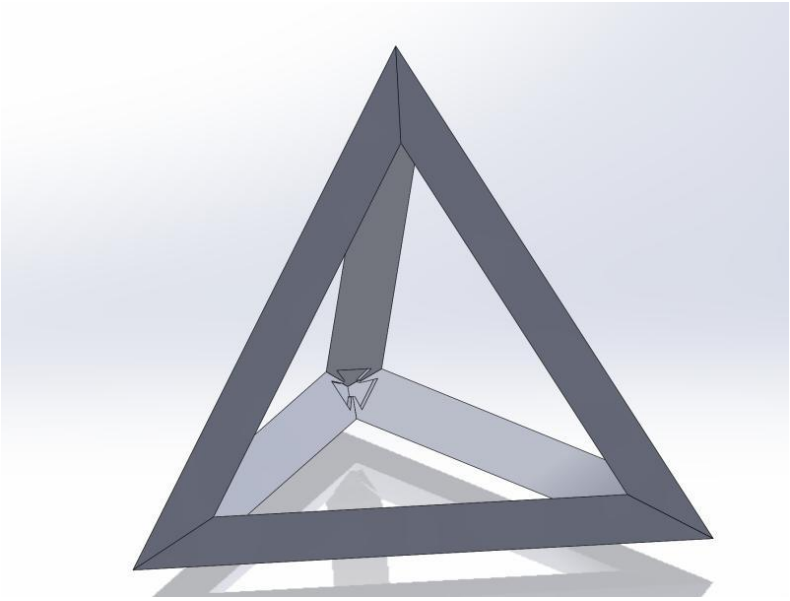

Figure 7: Tetrahedra Sub-assembly

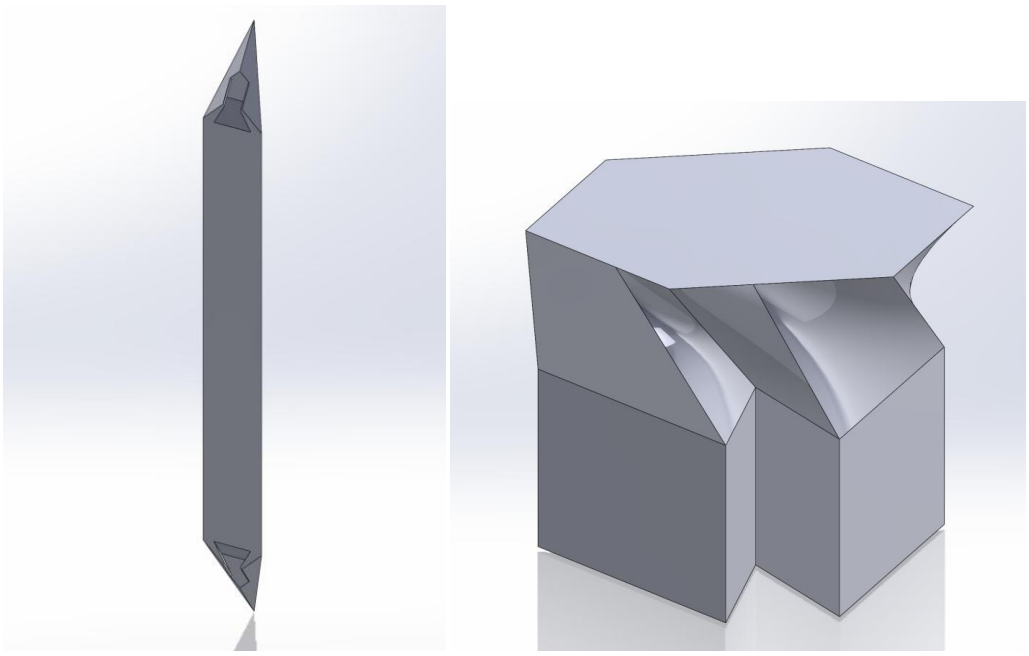

Figure 8: Base Unit and Connector Unit

Soap Dispenser Bottle

This is a personal design challenge to create a soap dispenser bottle compatible with an existing pump I had. I had seen many parametric 3D printable models before and wanted to give it a try myself. I included a design constraint that the 3D model must not require support during printing.

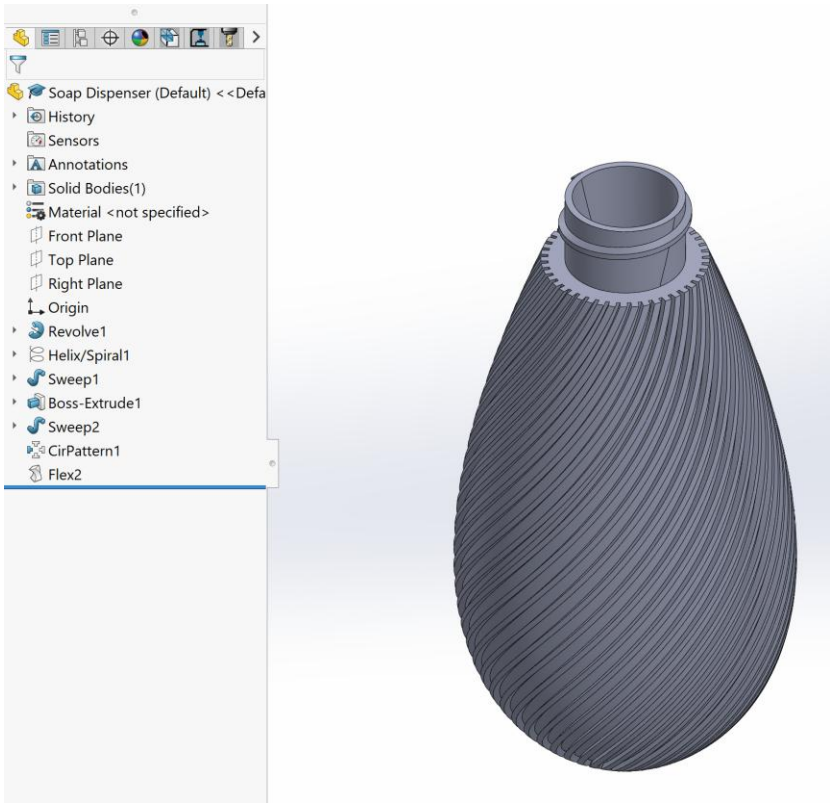

Figure 9: Soap Dispenser Bottle

Figure 10: Section View Soap Bottle

Plate Surface Modeling

A project following a YouTube tutorial to explore surface modeling.

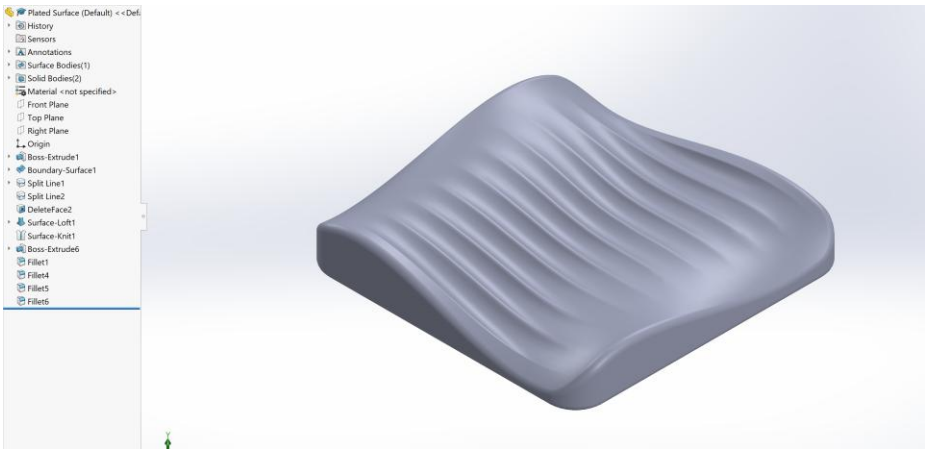

Figure 11: Plated Surface

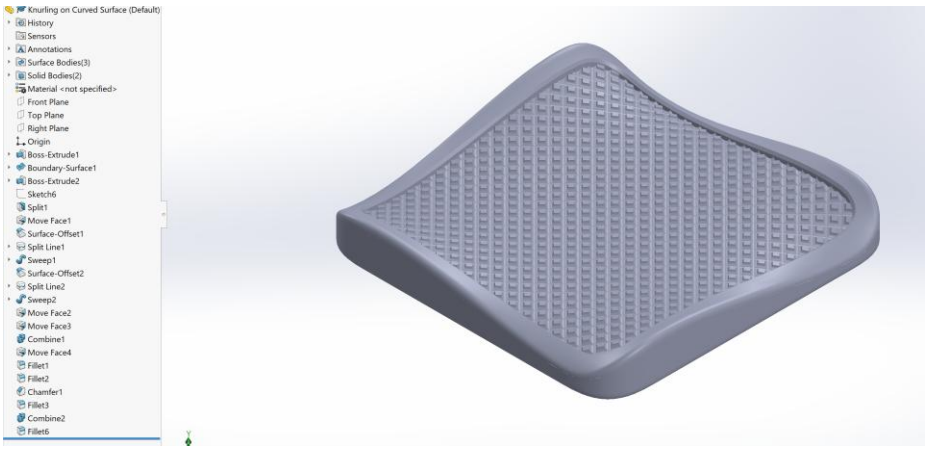

Figure 12: Knurling on a Curved Surface

Cubic Surface Modeling

More exploration of surface modeling with a cubic surface.

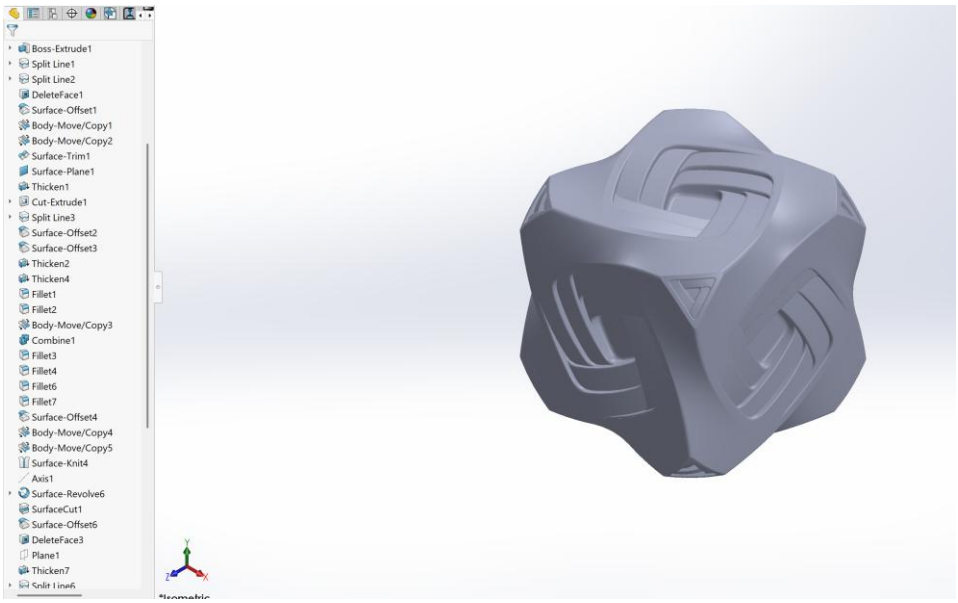

Figure 13: Magic Cube

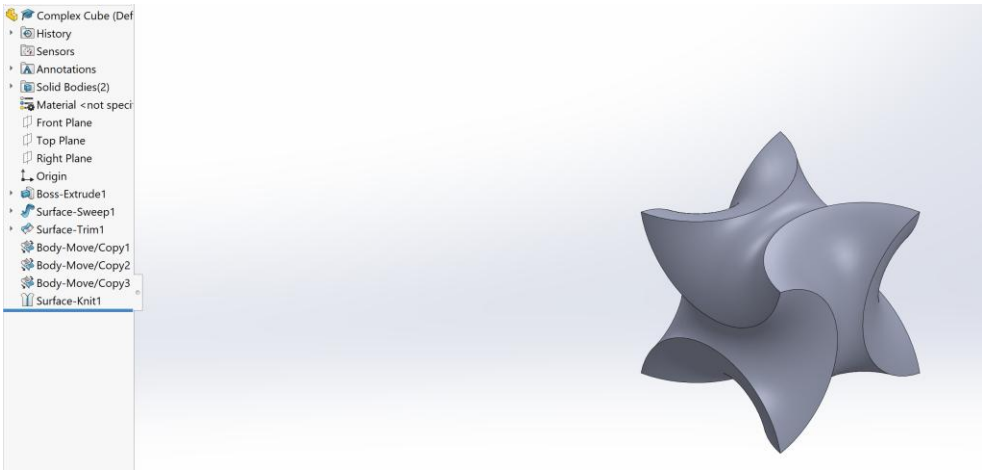

Figure 14: Complex Cube

Volkswagen Logo for Car

I designed this to replace the VW logo on my brothers car, because his broke.

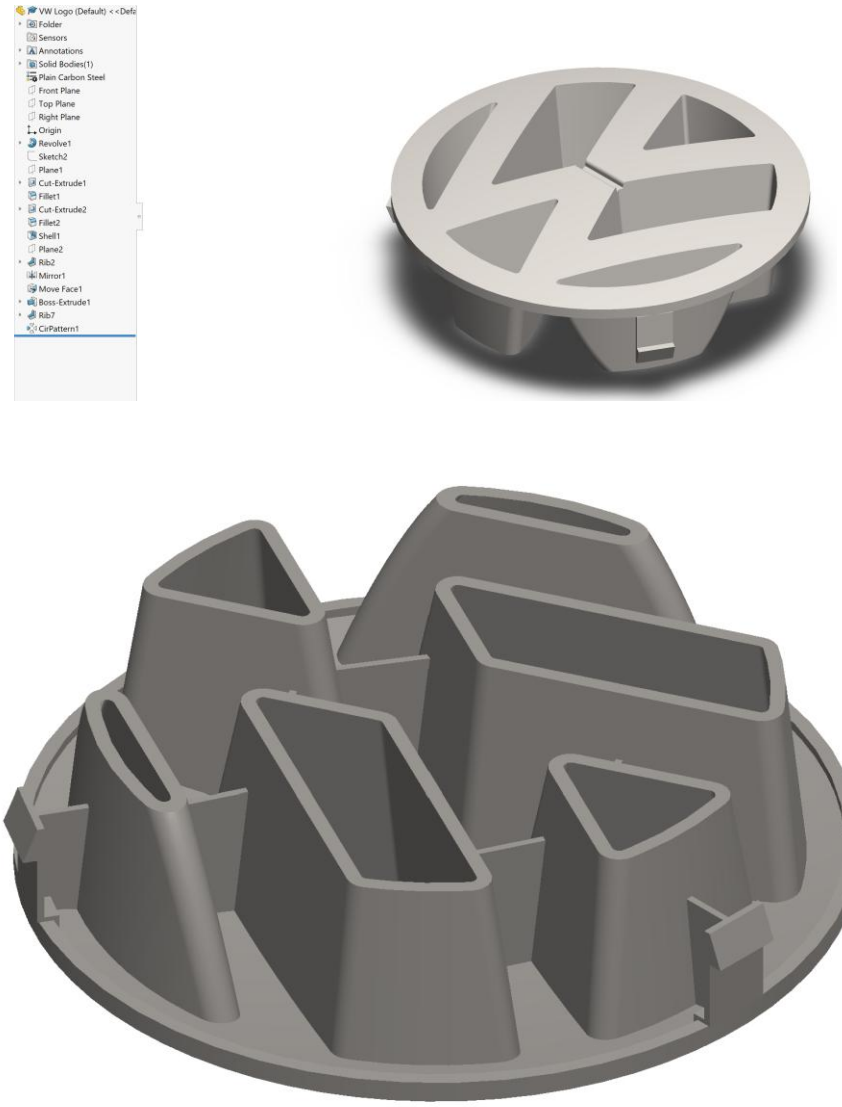

Figure 15: VW Logo

Thank you for reviewing my work!

I'm currently seeking CAD drafting or design-focused opportunities—remote or local—where I can contribute my modeling, prototyping, and documentation skills.
ggoulart@my.gcu.edu | linkedin.com/in/grant-goulart-826621320