

CAD Portfolio

Grant Goulart

Includes Internship, Class, and Personal Projects

Exercise 252

Another practice part from CAD CAM TUTORIAL BY MAHTABALAM on YouTube, to practice my skills. I took a screenshot of the drawing and did not watch the tutorial until after and had the goal of optimizing my workflow in mind. The result is what I believe to be a much more efficient and intuitive method of modeling this part than in the tutorial.

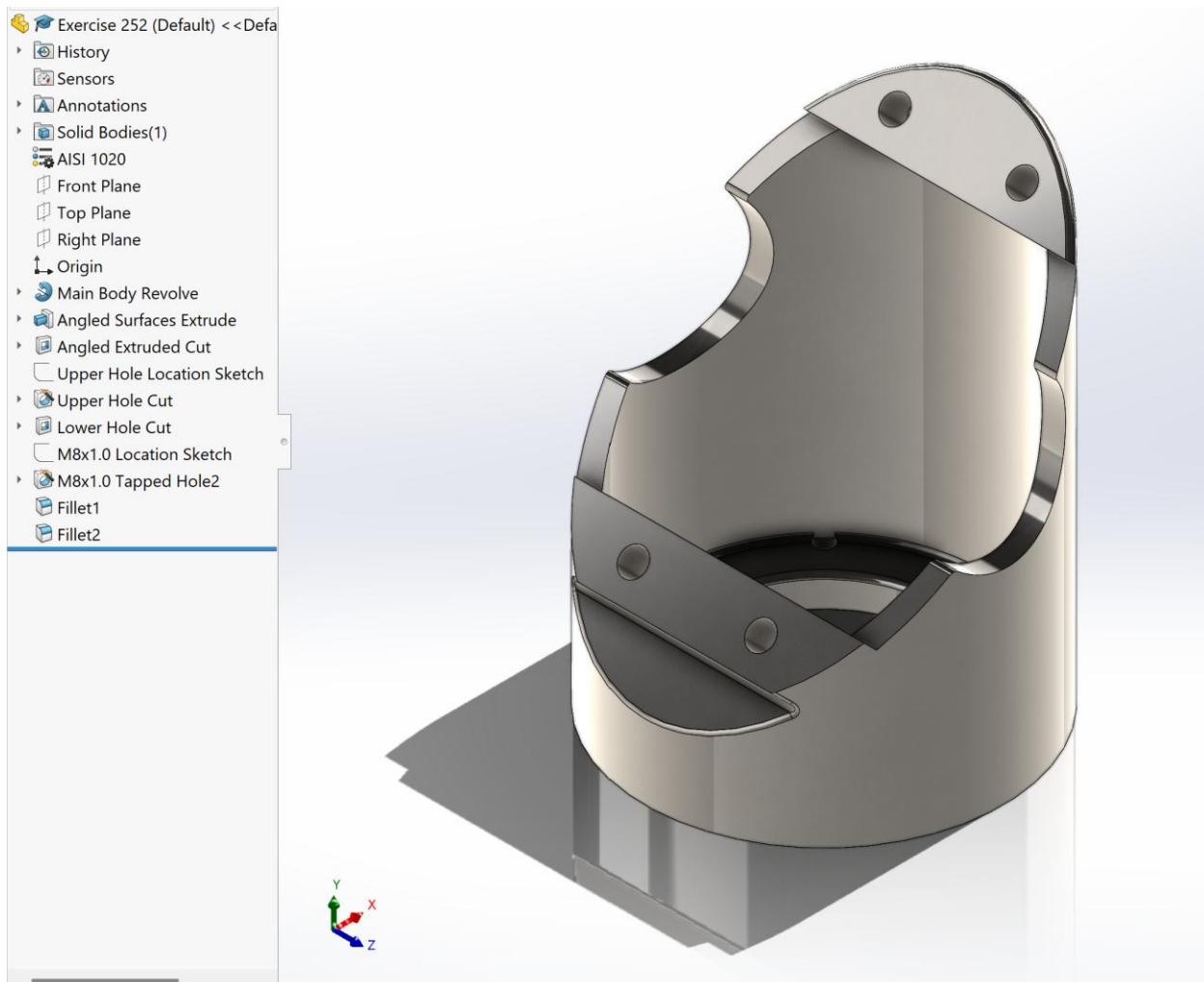
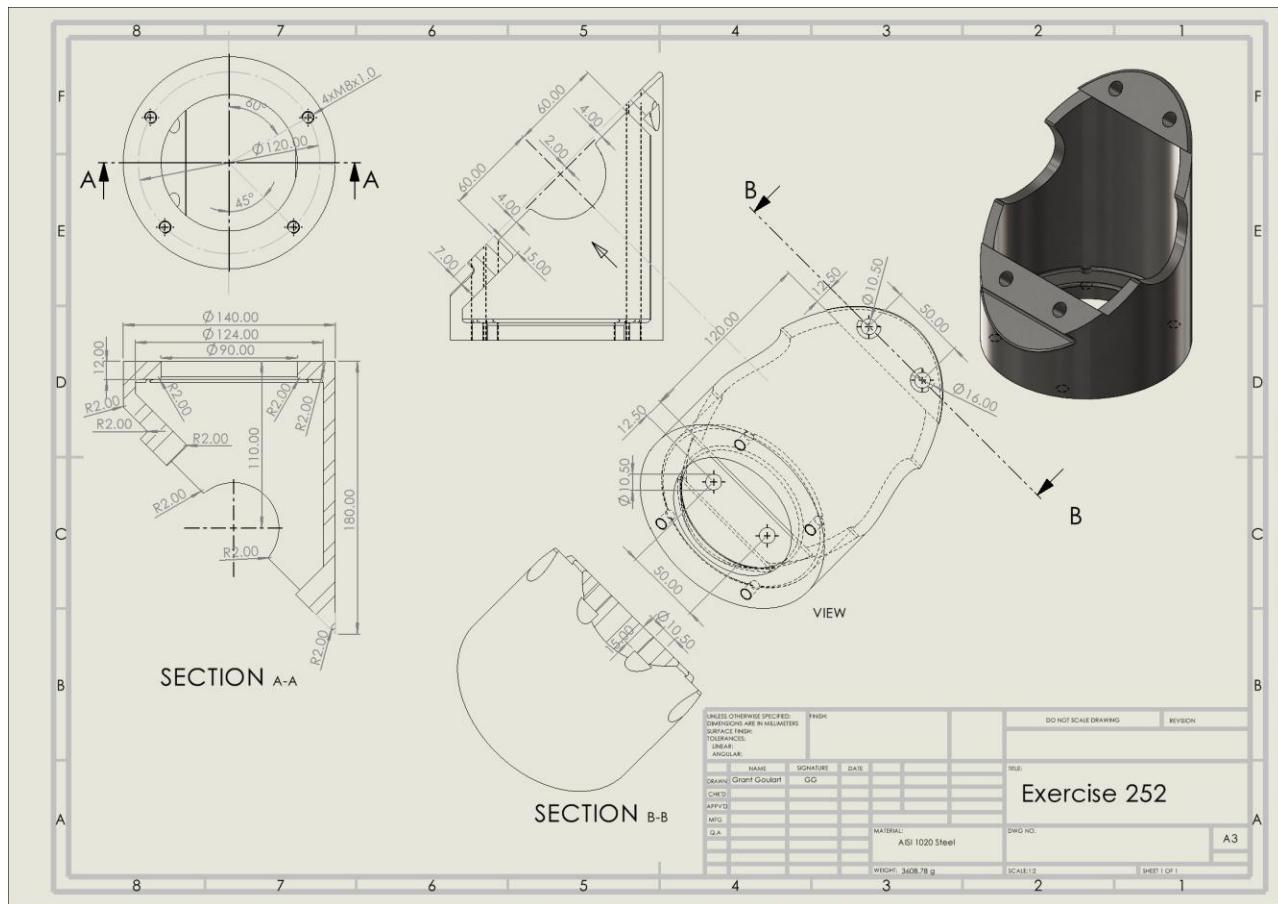


Figure 1: Exercise 252



Single Cylinder Engine Block Practice

I found this model on a YouTube tutorial to practice my modeling skills (CAD CAM TUTORIAL BY MAHTABALAM). I challenged myself to minimize my use of the actual tutorial and only use the provided drawing to create this.

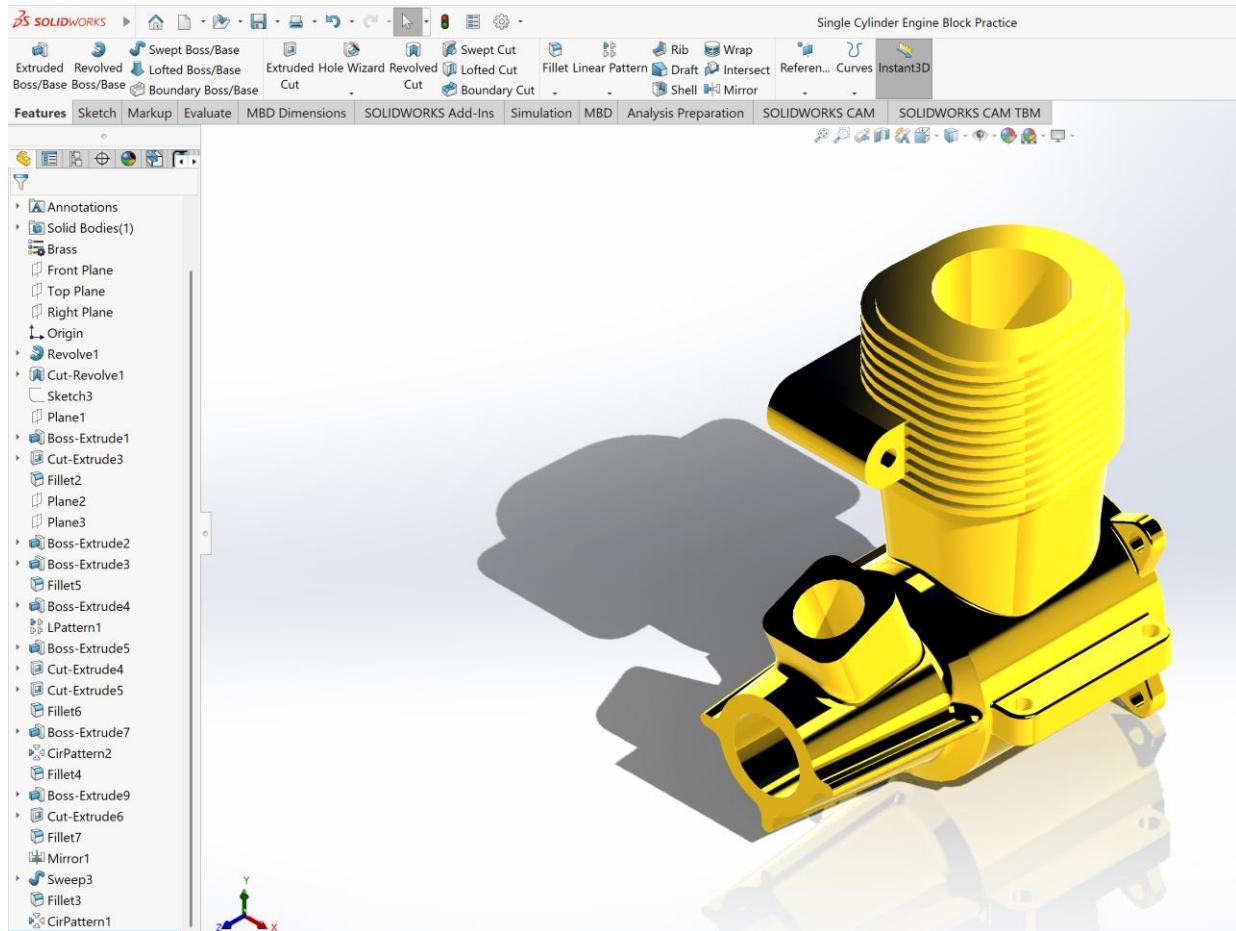


Figure 2: Single Cylinder Engine Block Practice

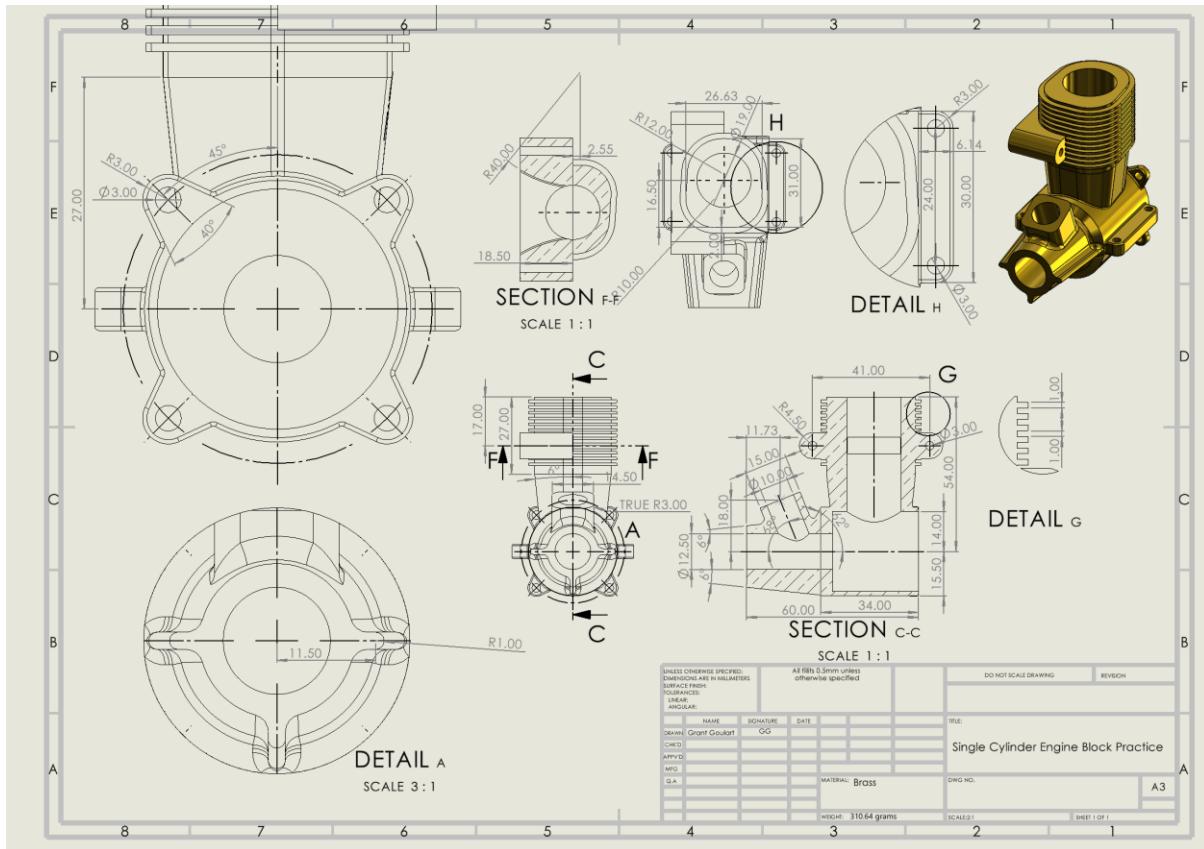


Figure 3: Single Cylinder Engine Block Drawing

Naval Research Enterprise Internship Program (NREIP)

Find all CAD documents for this project in my [GitHub Repository](#)

(Full assembly file excluded due to size limitations; see images below.)

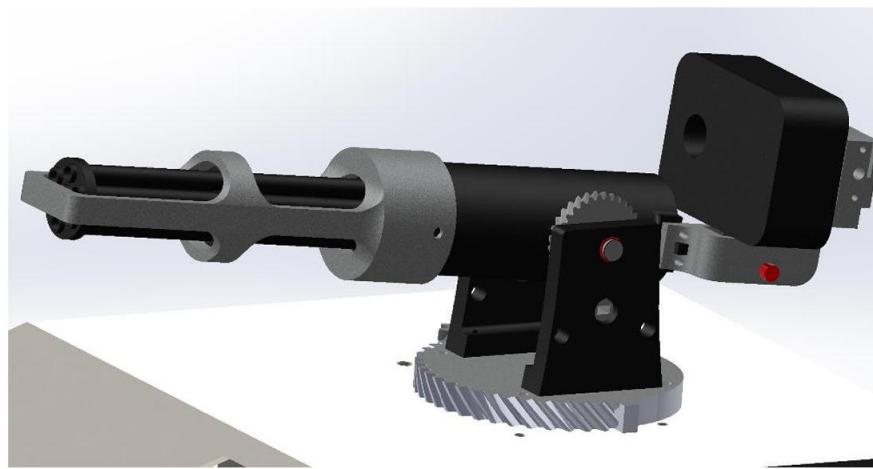
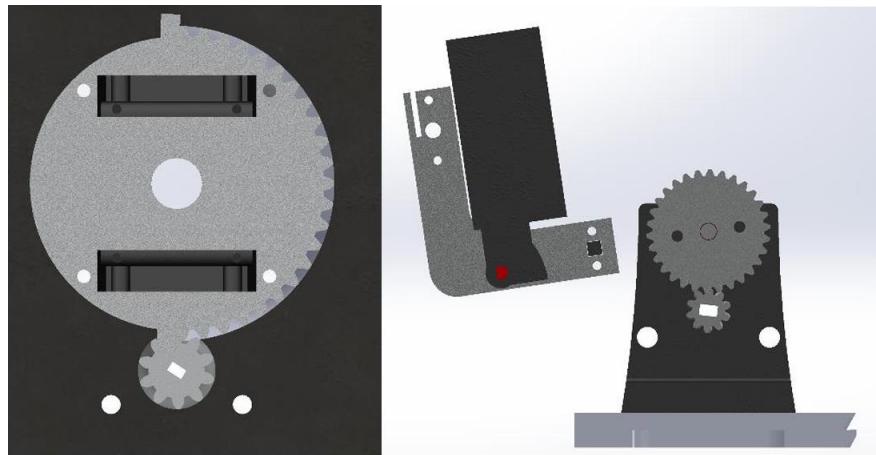


Figure 4: Laser Modulator Assembly

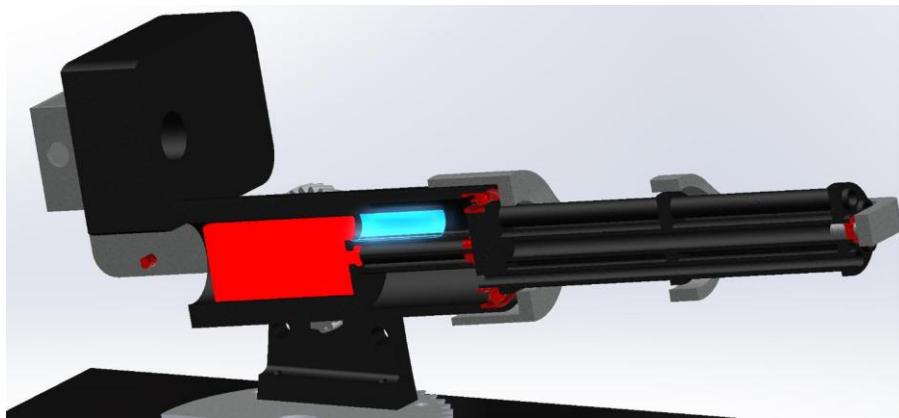


Figure 5: Section View of Laser Modulator

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](#)

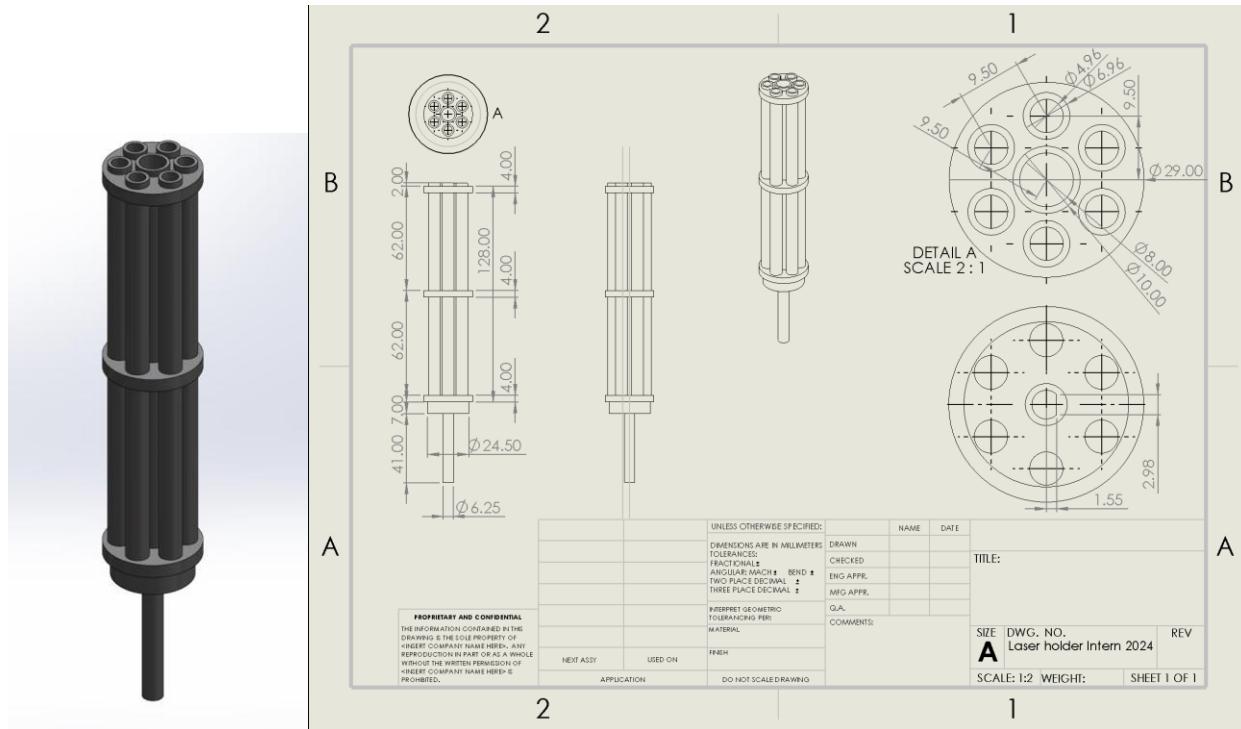


Figure 6: Laser Modulator Drawing

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.

For a full project overview, please visit the “Projects” section of my LinkedIn

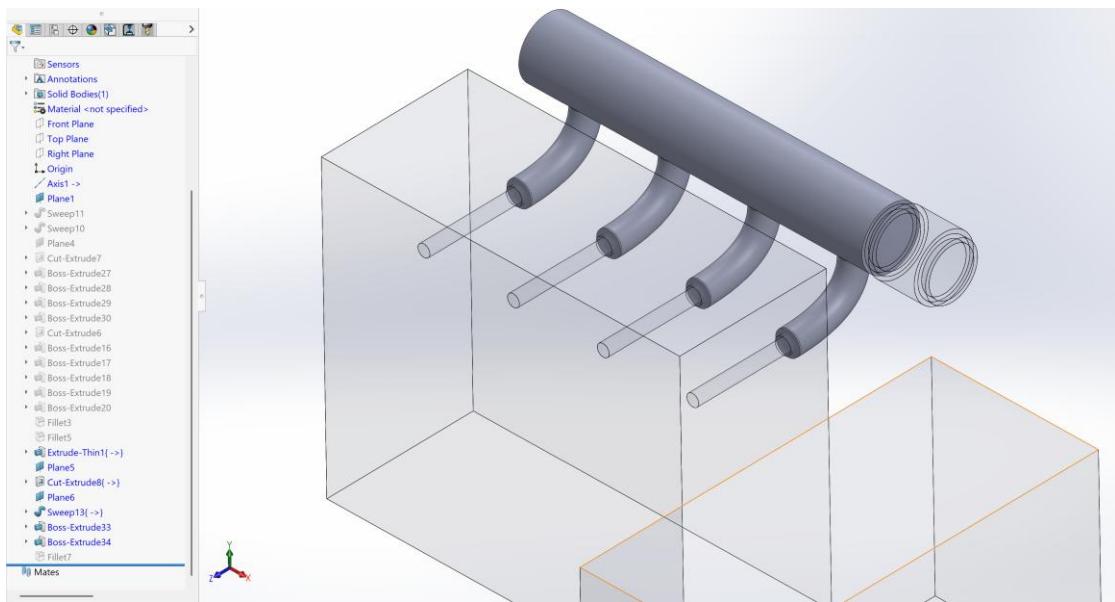


Figure 7: Engine Manifold

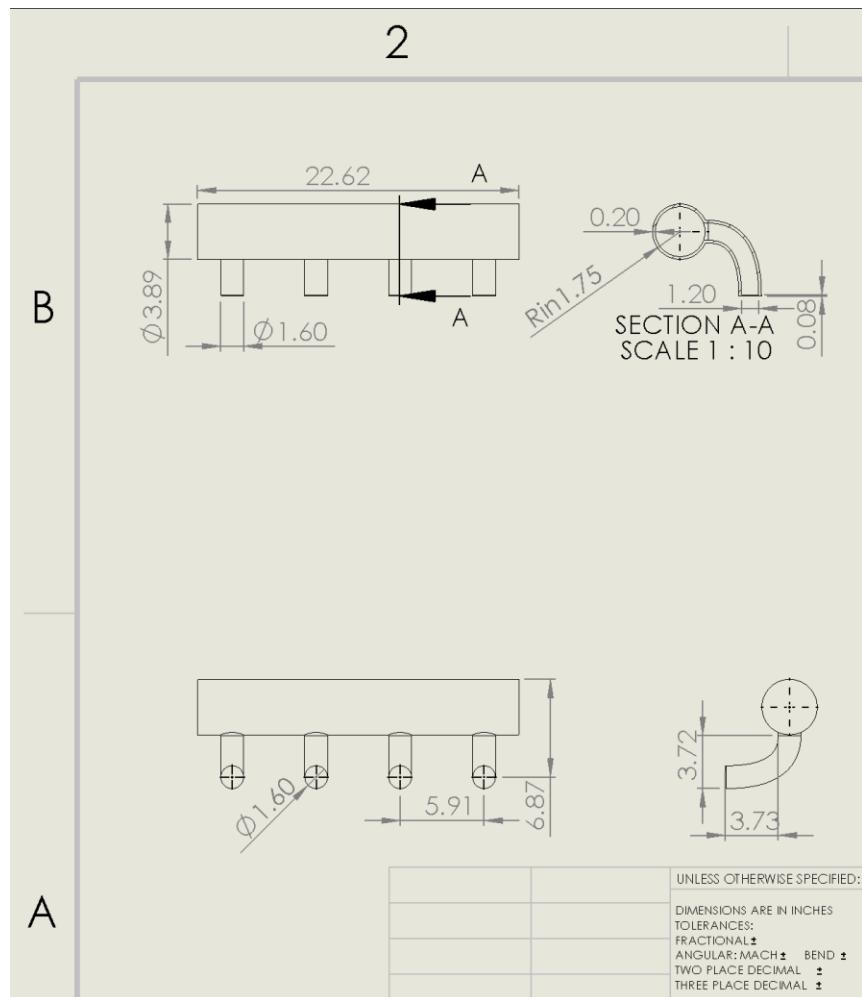


Figure 8: Engine Manifold Drawing

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.

For a full project overview, please visit the “Projects” section of my LinkedIn

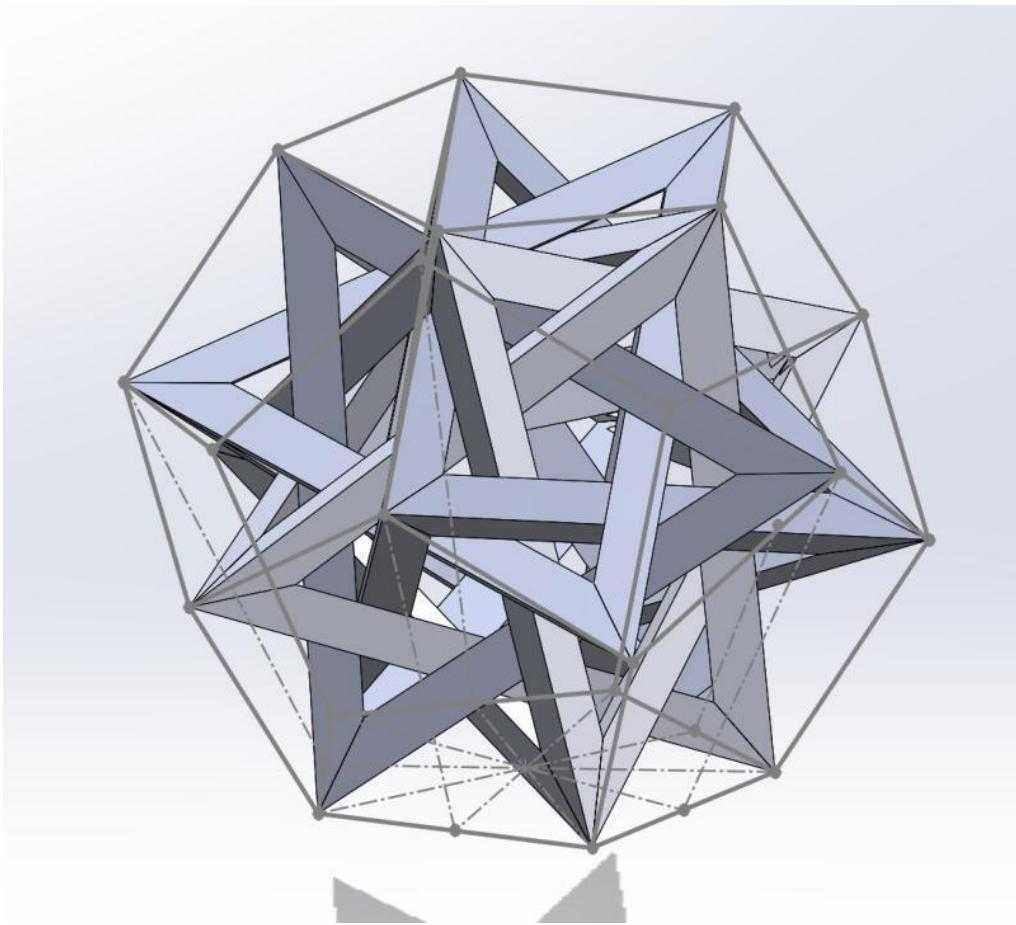


Figure 9: 5 Intersecting Tetrahedra Assembly

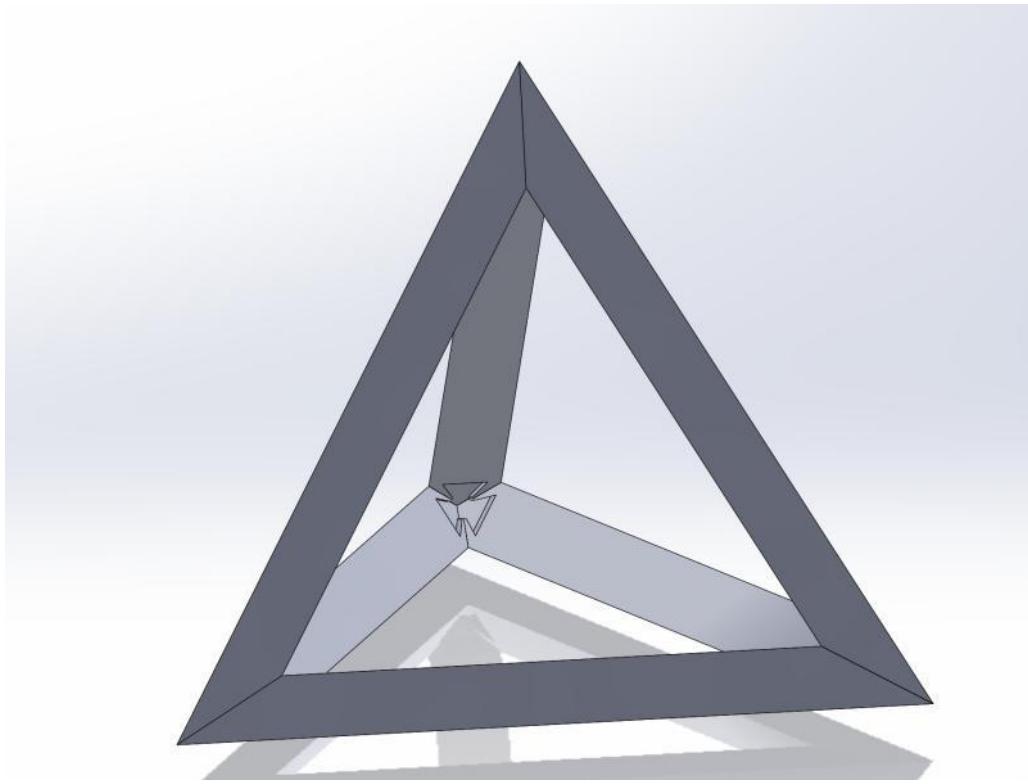


Figure 10: Tetrahedra Sub-assembly

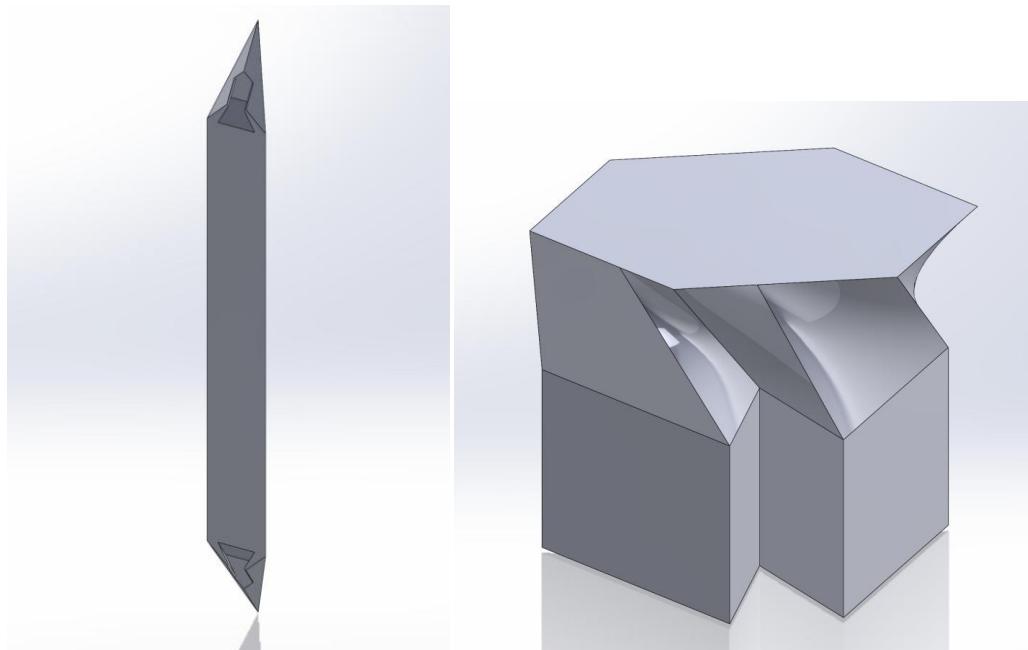


Figure 11: Base Unit and Connector Unit

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.

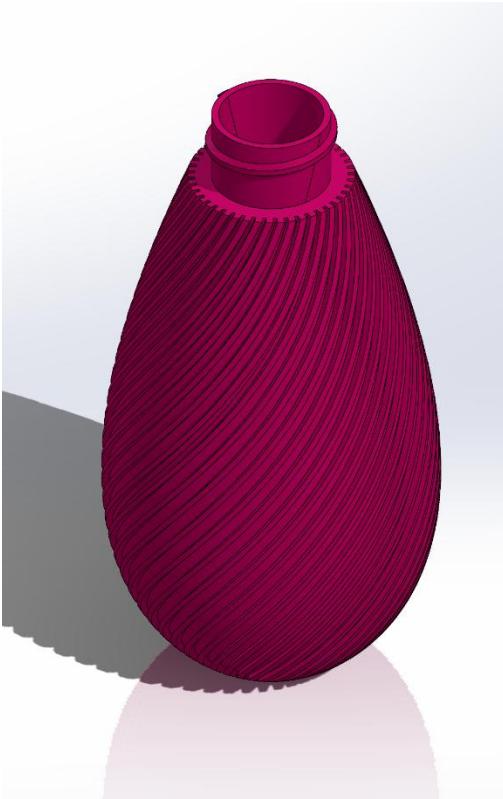


Figure 12: Soap Dispenser Bottle



Figure 13: Section View Soap Bottle

Plate Surface Modeling

Projects following a YouTube tutorial (Easy CAD Solutions) to explore surface modeling.

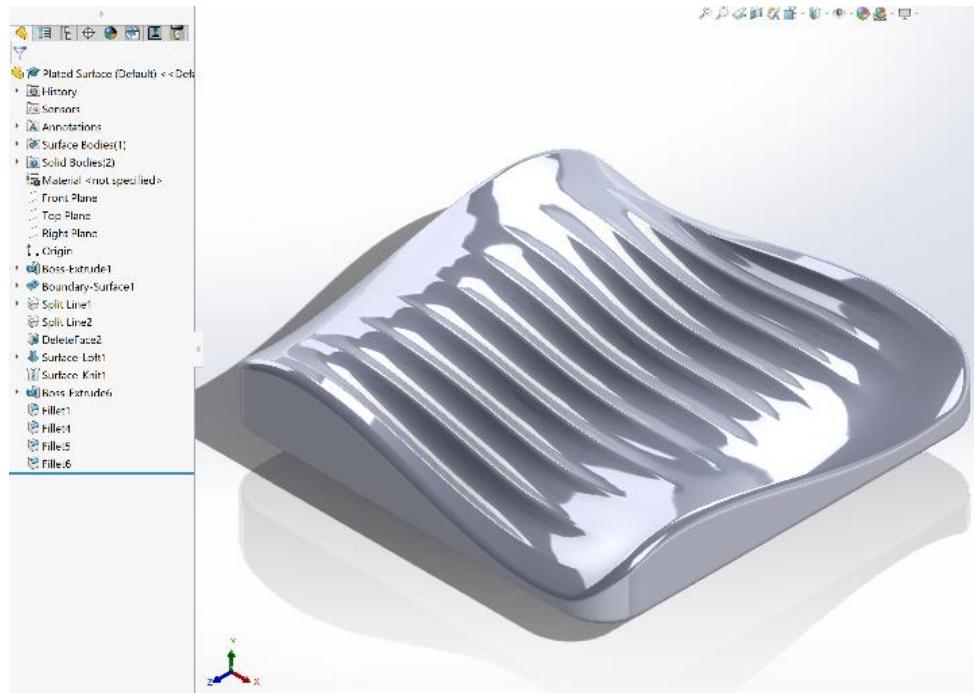


Figure 14: Plated Surface

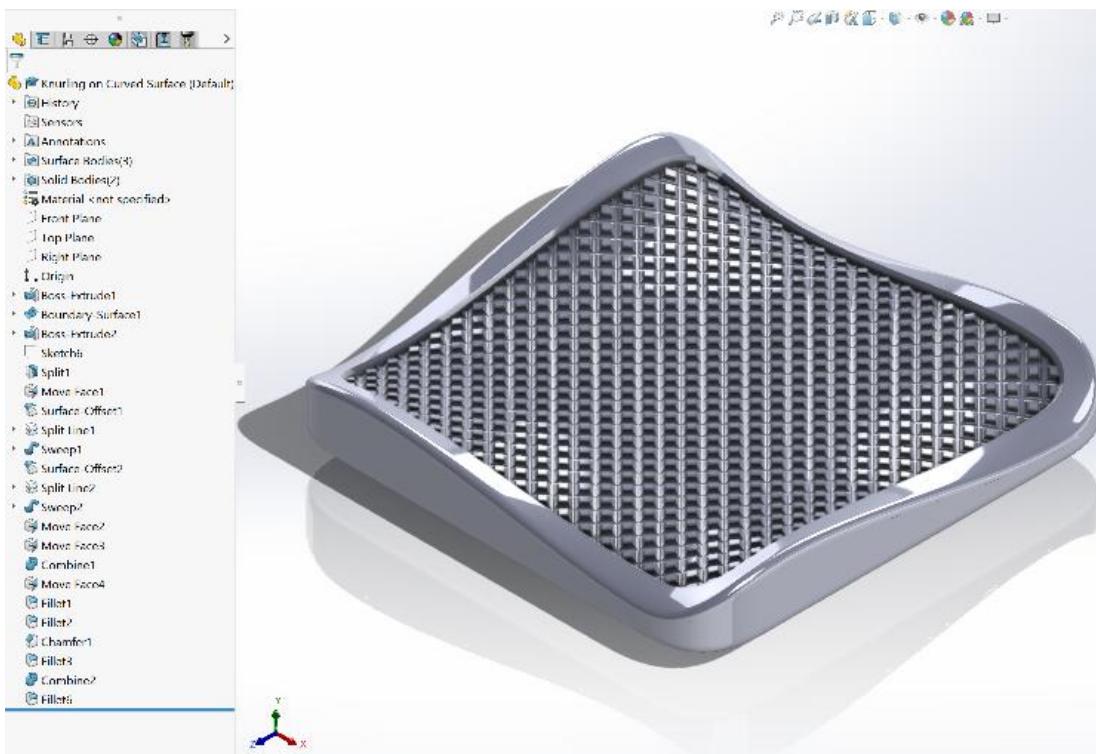


Figure 15: Knurling on a Curved Surface

Cubic Surface Modeling

More exploration of surface modeling with a cubic surface.

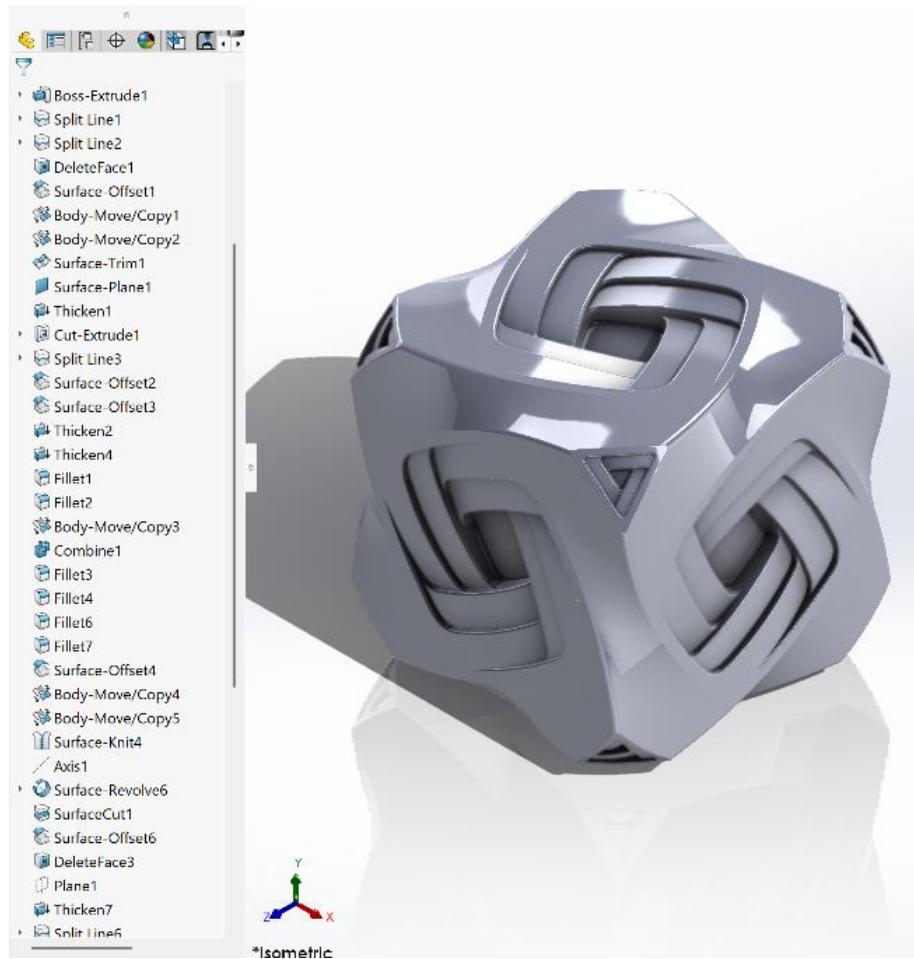


Figure 16: Magic Cube

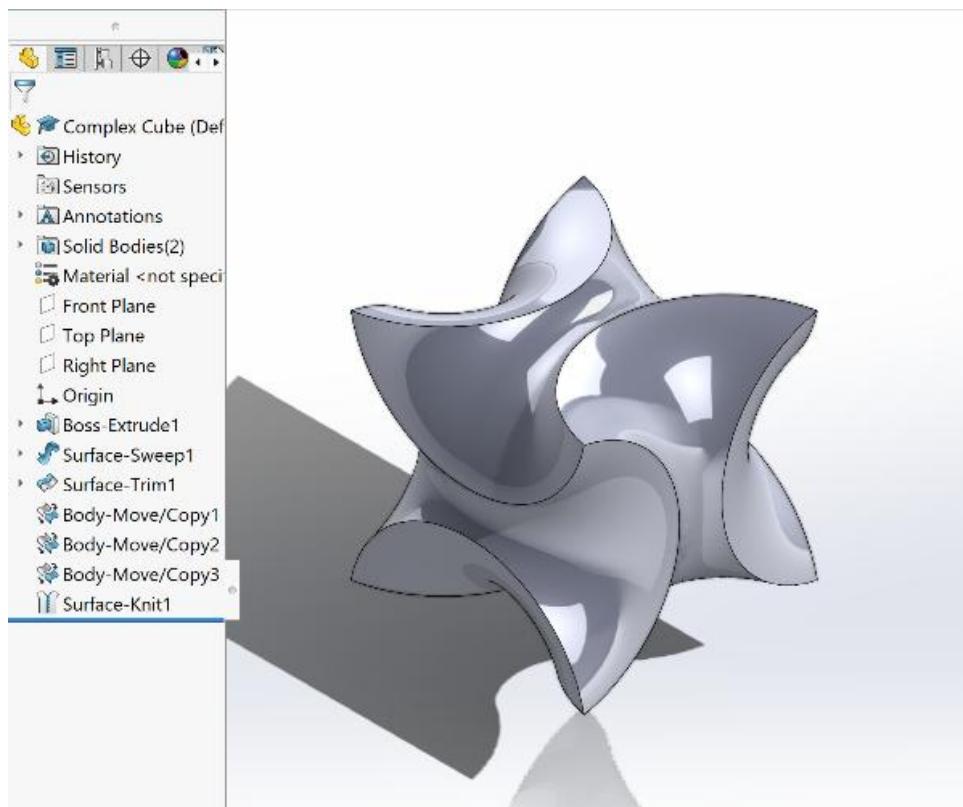


Figure 17: Complex Cube

Volkswagen Logo for Car

I designed this to replace the VW logo on my brothers car, because his broke. It was a fun design challenge.

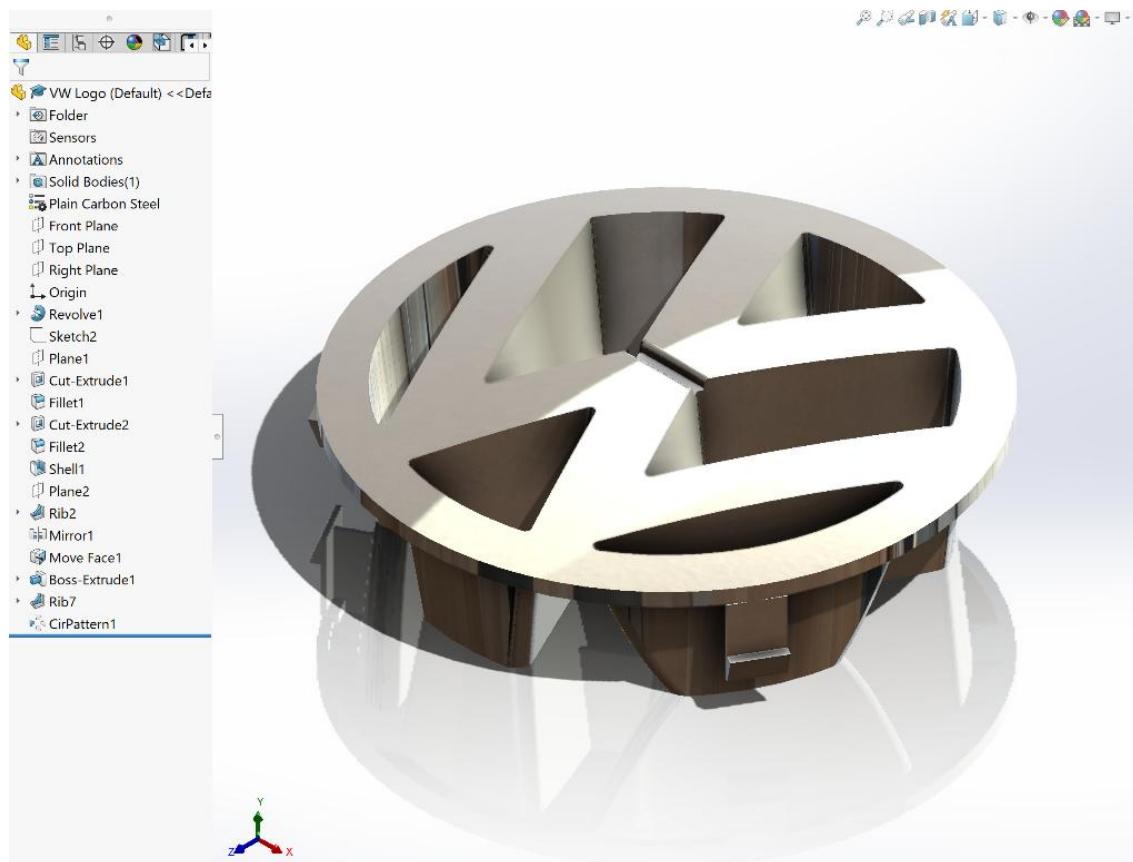




Figure 18: VW Logo

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.
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