CAD Portfolio

Irene Sha | irenesha4@gmail.com

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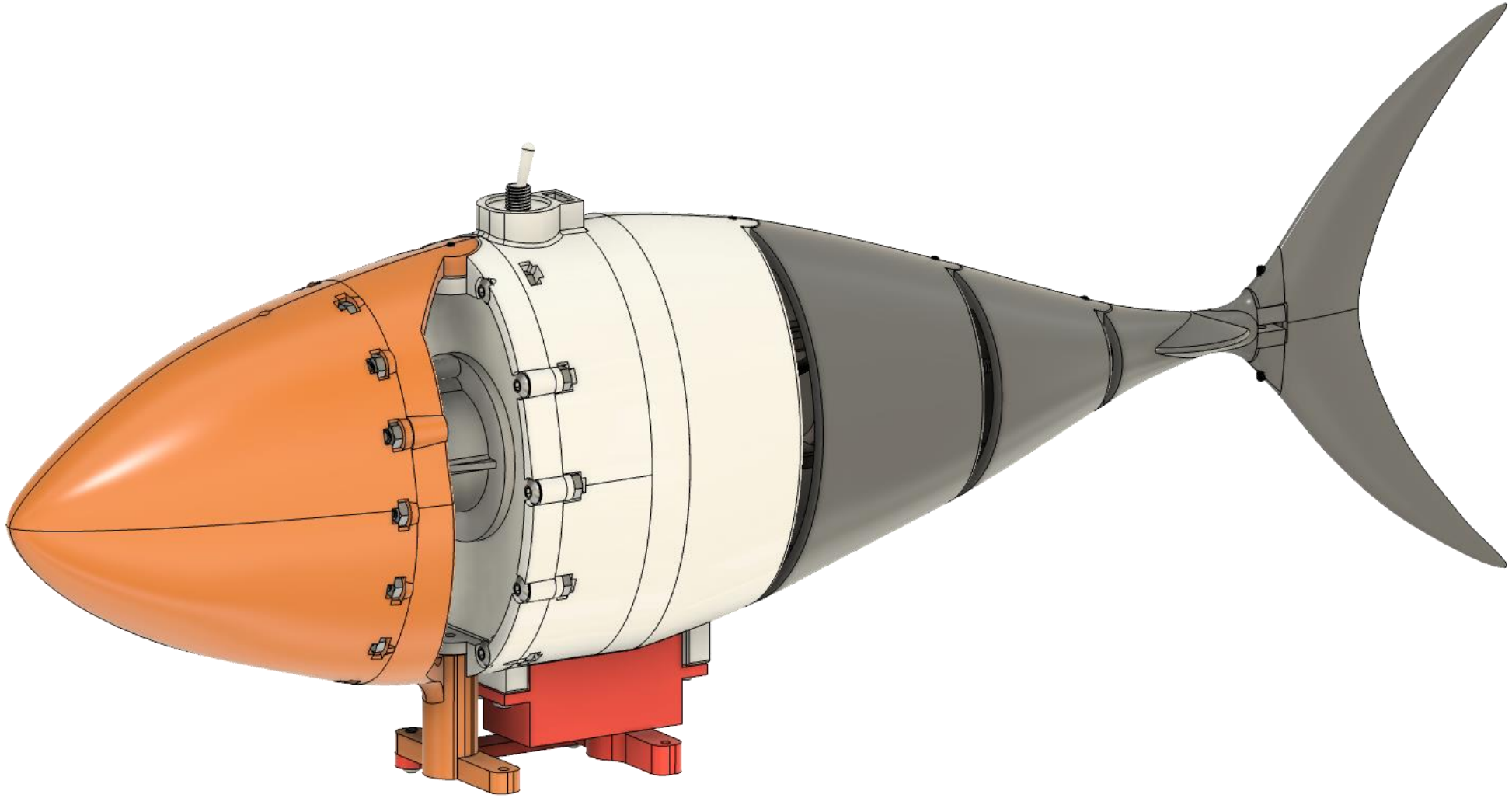
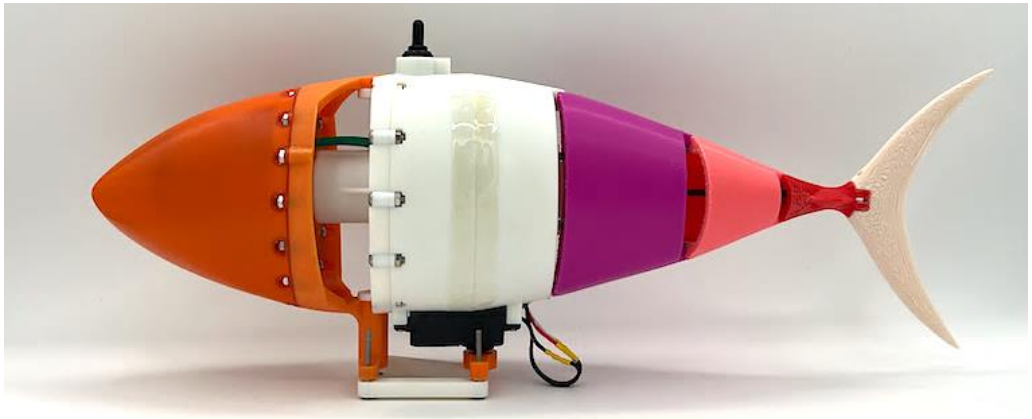
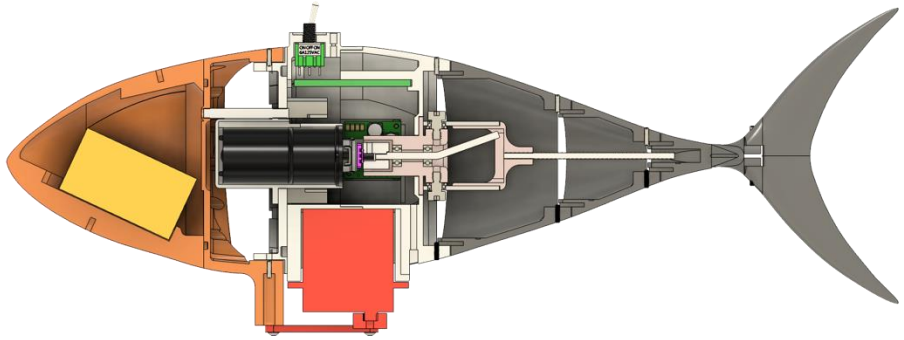
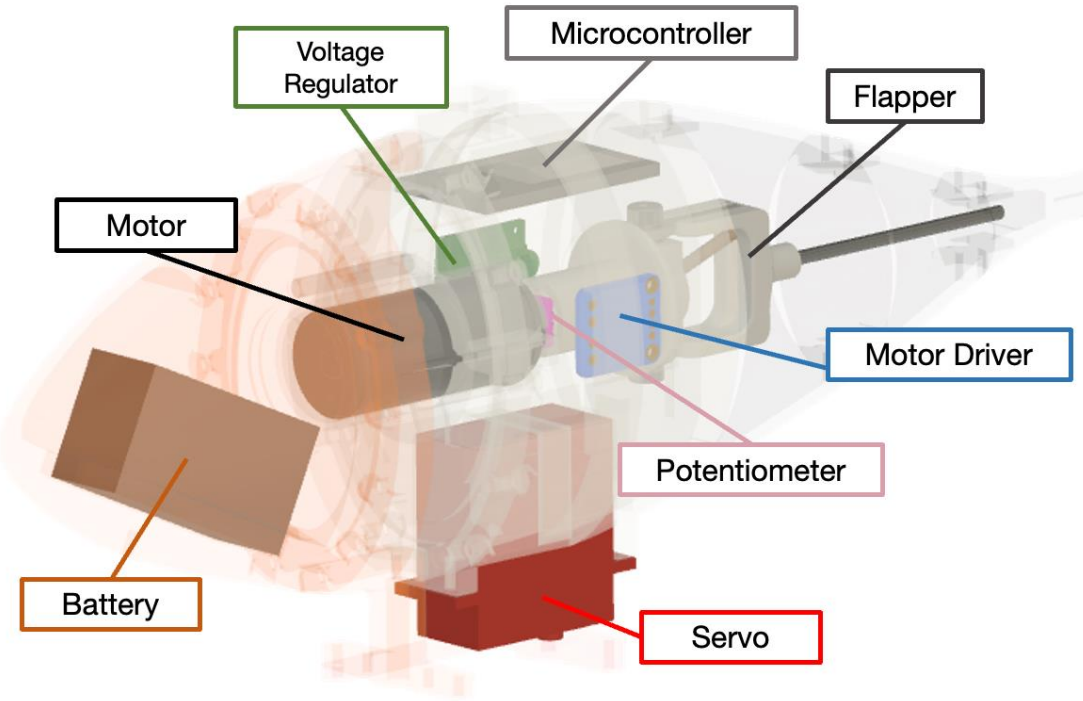


BlueKoi – Robotic Fish

Goal: Design and test an untethered, efficient, and maneuverable robotic fish for potential swarm integration.
Fab: 3D Printed (PLA, Polyjet resin), Water jet

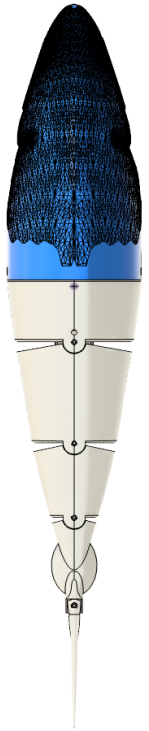




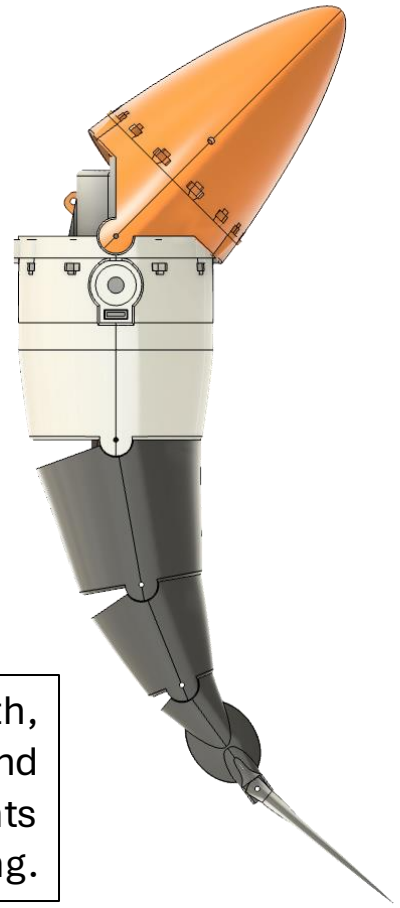


BlueKoi – Robotic Fish

Notes: This project heavily involved not only CAD but also design of systems (power, compute, etc. using off-the-shelf components) and waterproofing techniques (face seals, shaft seals). Space within the robot is very constrained, making it challenging to fit all the necessary parts.

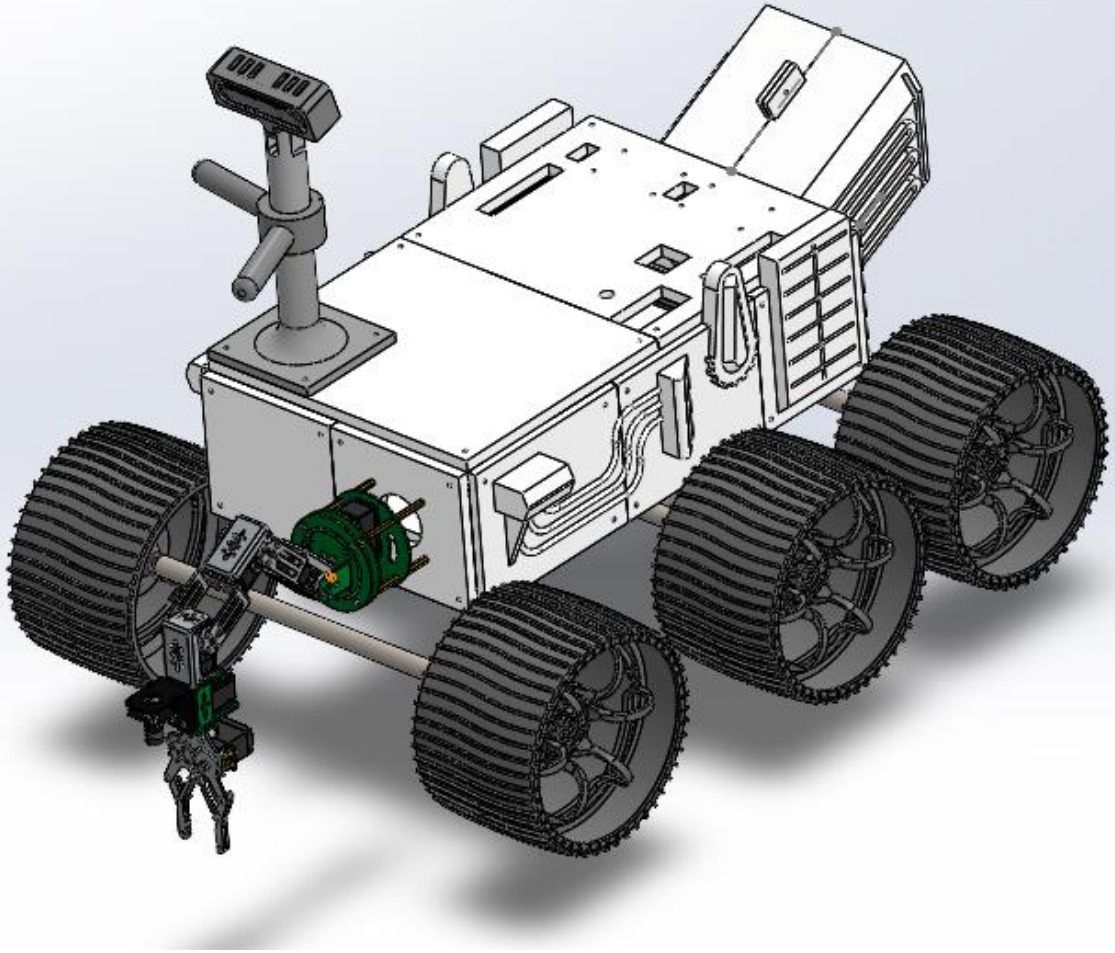


The current design is based on our collaborator's **TunaBot Flex**, a tethered, single-motor robot with no ability to maneuver.



BlueKoi in comparison is 1.5x length, includes enclosed electronics and waterproofing, and other improvements for it to be free swimming.

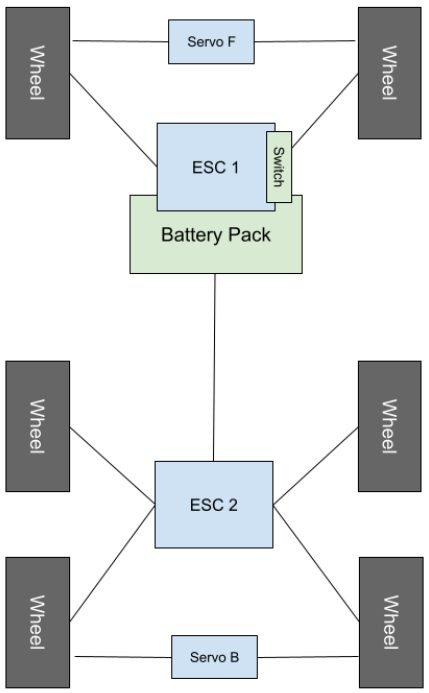
BlueKoi – Robotic Fish

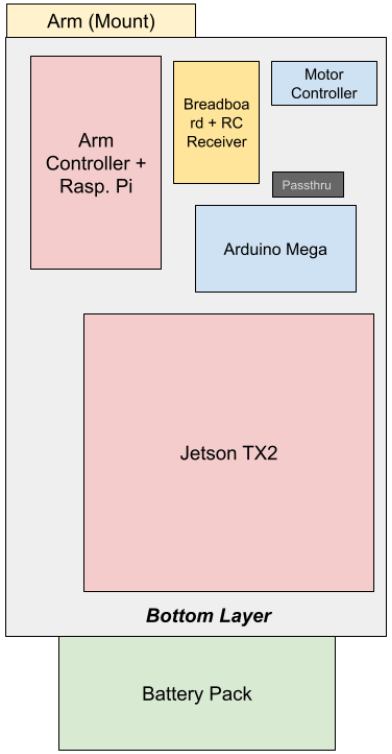


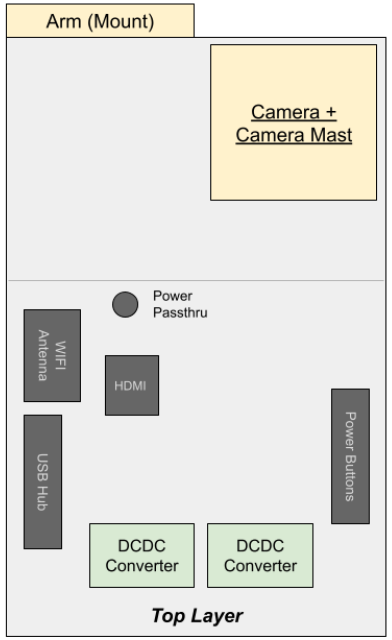
PERCY Robot

Goal: Senior thesis with a team of 4; created a simple replica of the Mars Perseverance rover for educational demonstrations. Built on the base of a base of a RC car, we modified and added functionality such as a off-the-shelf grabber arm and a depth camera

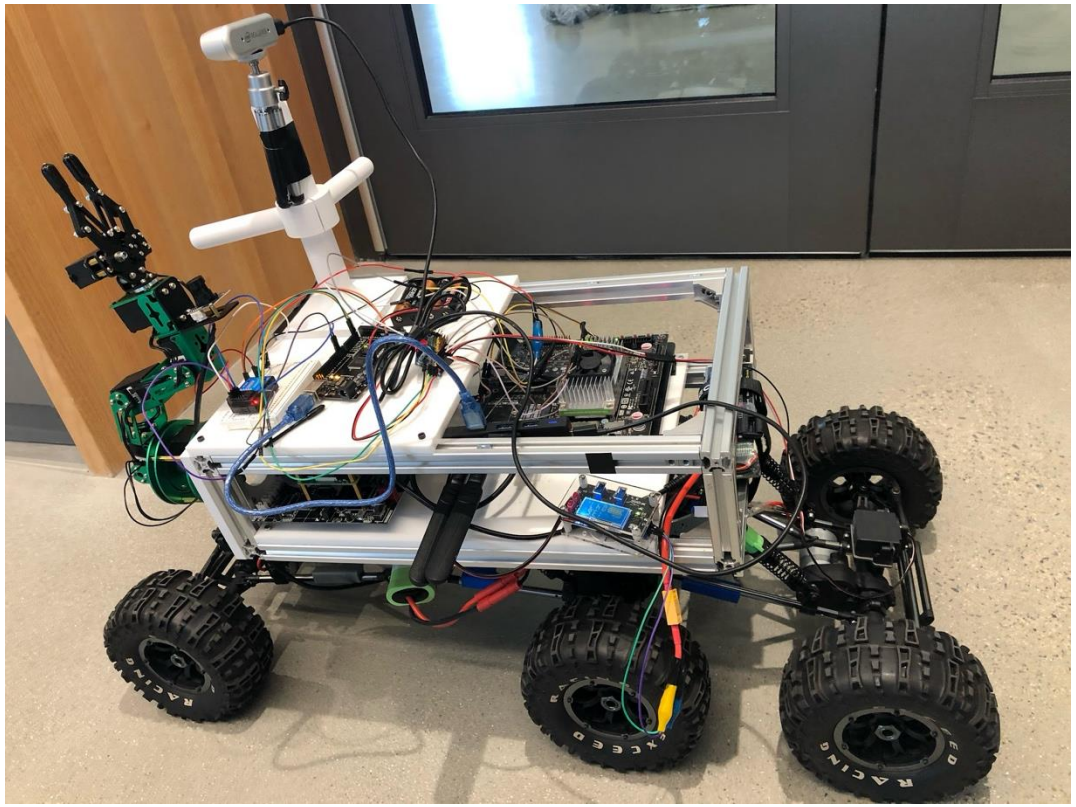
Fab: Laser cut acrylic, 3D printing





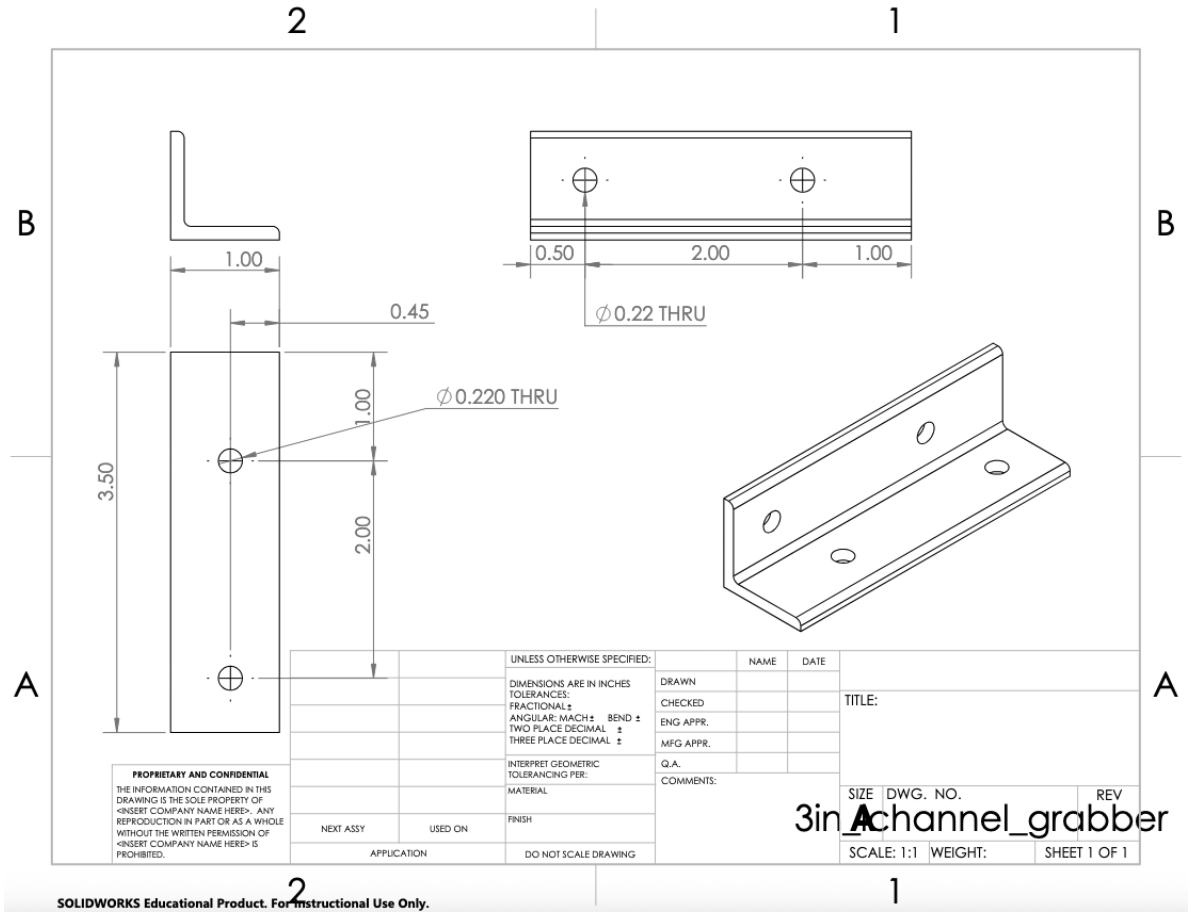


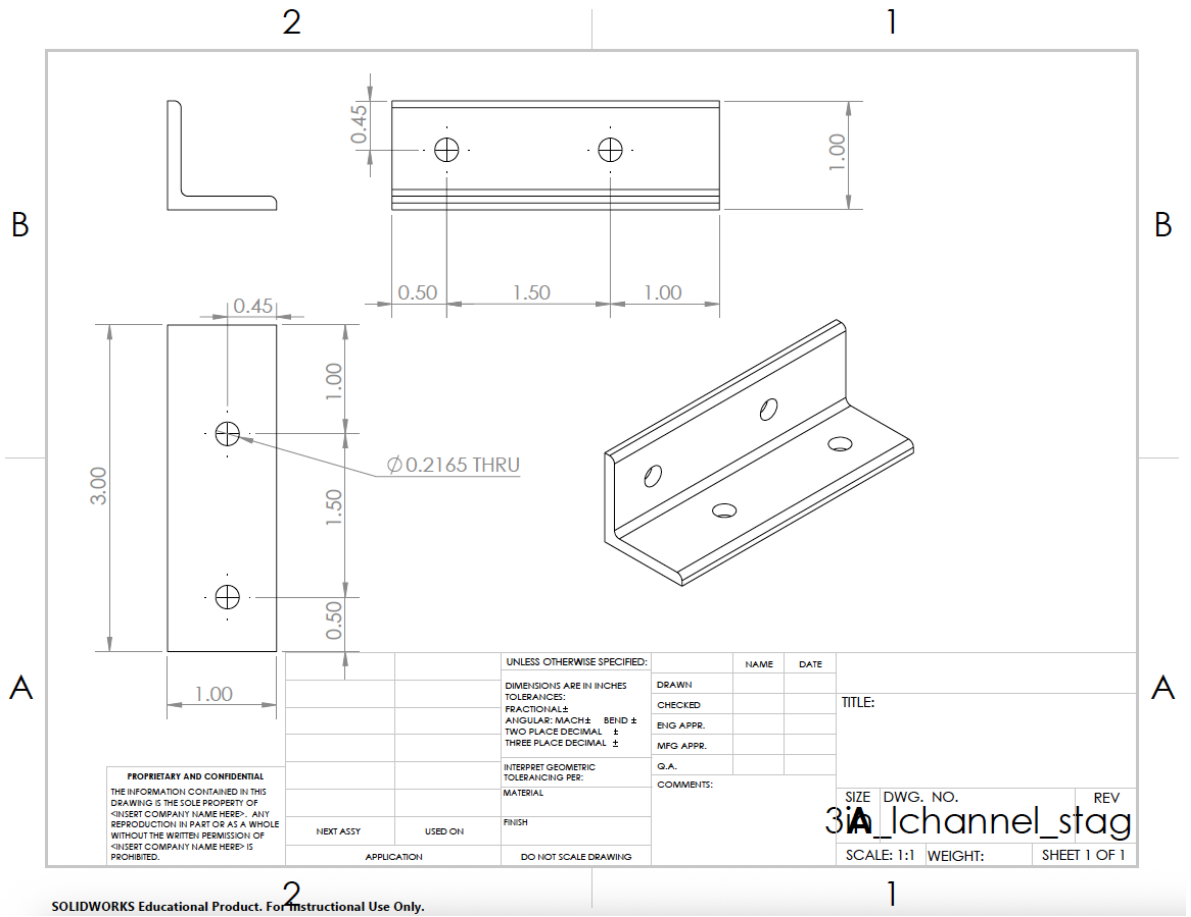
NOT TO SCALE



PERCY Robot

Notes: I primarily worked on the systems of the robot, integrating different circuits and onboard power for us to be able to control the robot over WiFi using ROS

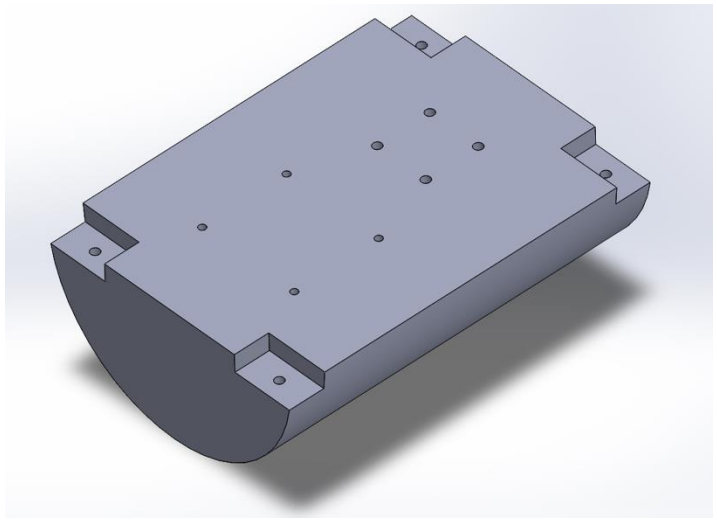


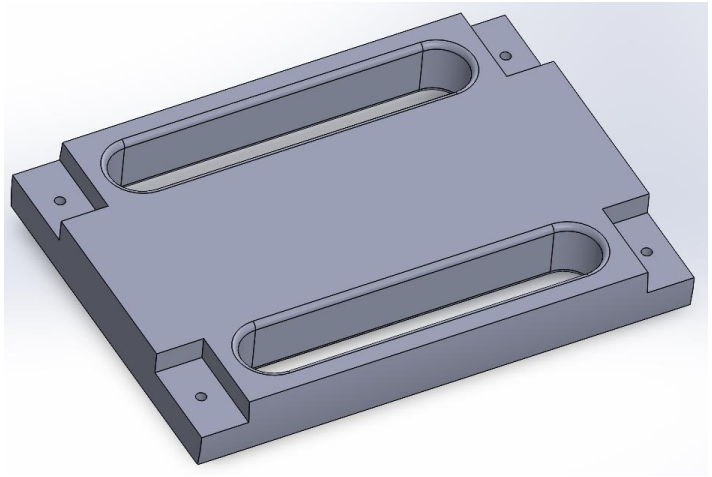


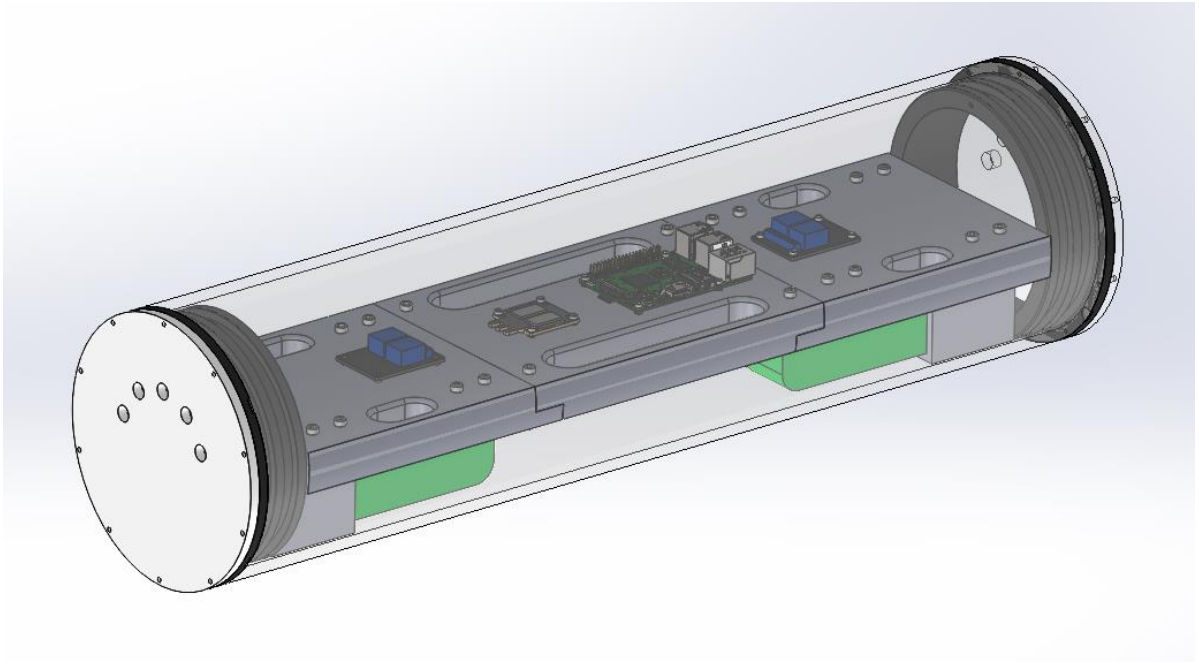
Triton Robosub – Fabrication

Goal: Draw & fabricate custom parts using machine tools for mounting of the grabber assembly, including these L brackets

Fab: Drill presses, hand drills

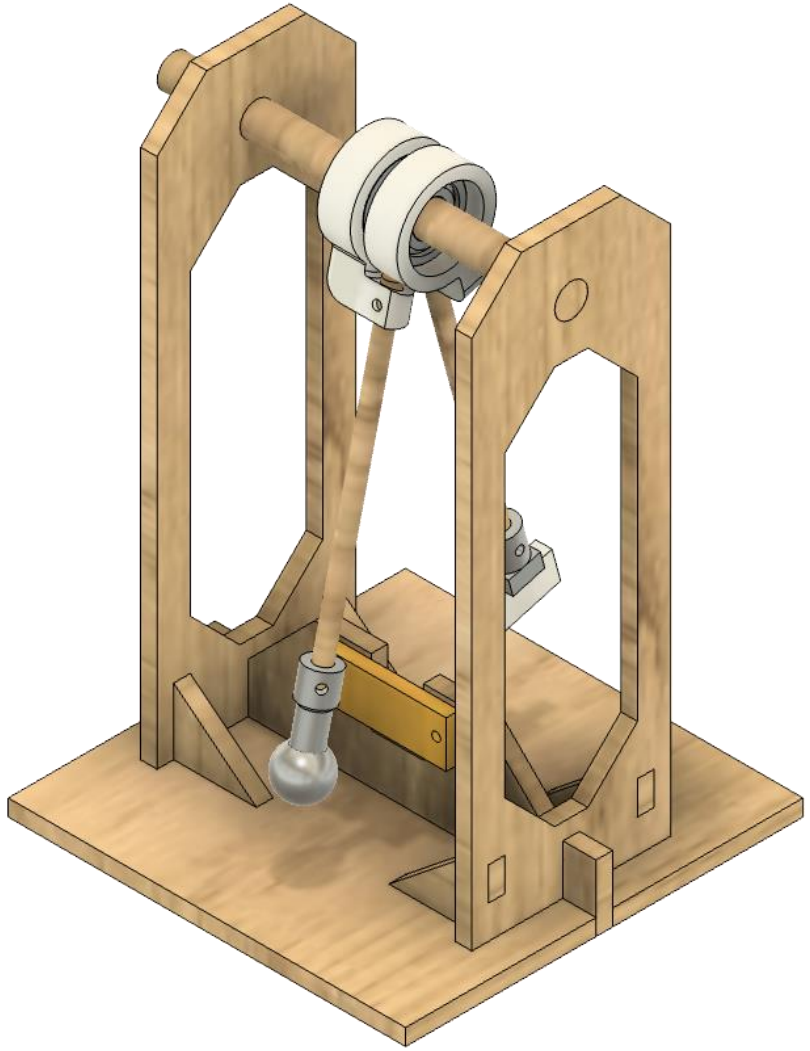


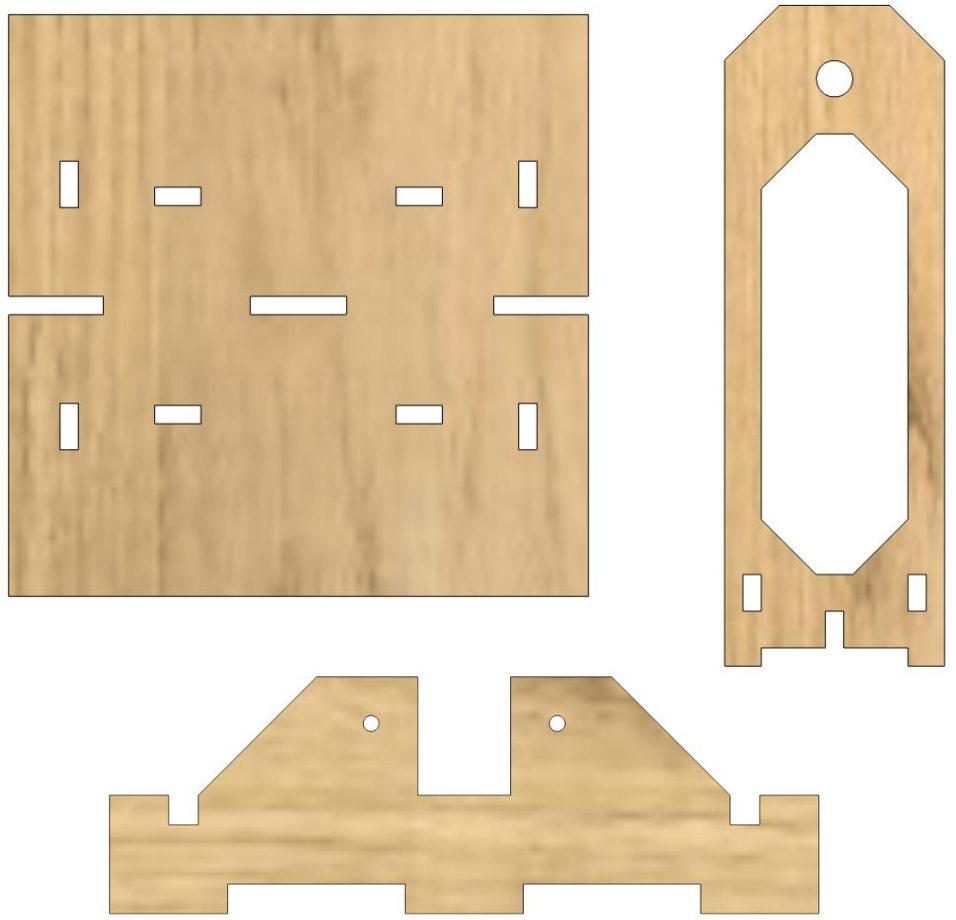




Yonder Deep – Battery Mount Design

Goal: Designed various parts for a battery stack mount in an AUV. Did not use PDM but used GrabCad instead for version control.
Fab: Not involved
Notes: Shown are some examples of parts I worked on.

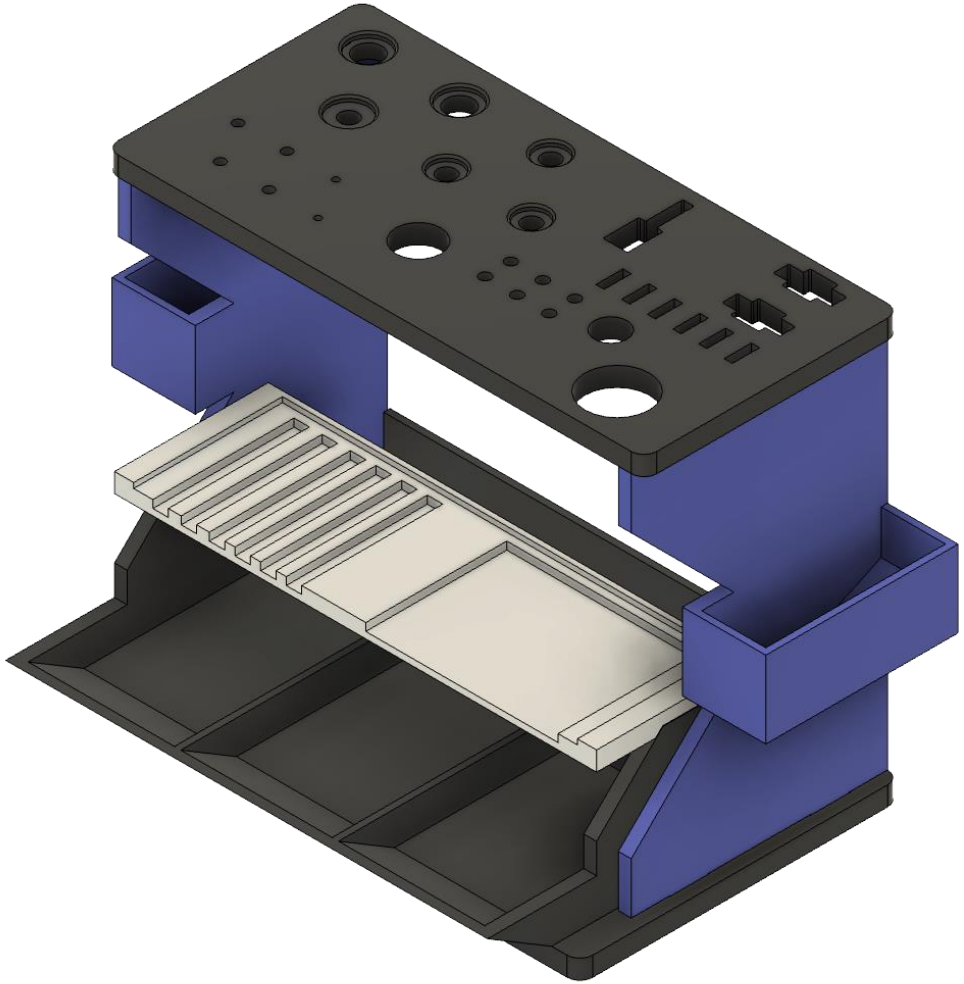


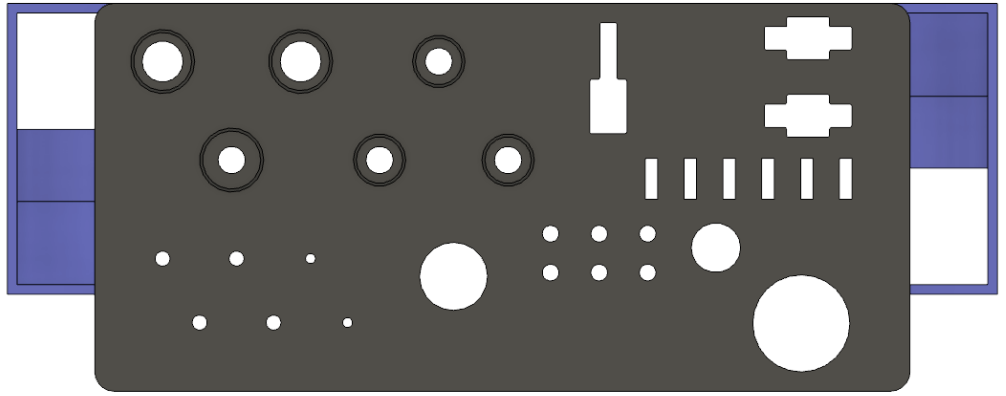


Pendulum for Materials Absorption Test

Goal: Test the ability for materials to absorb impact using by dropping the pendulum weight at a height and observing how far the other arm swings from momentum exchange principles

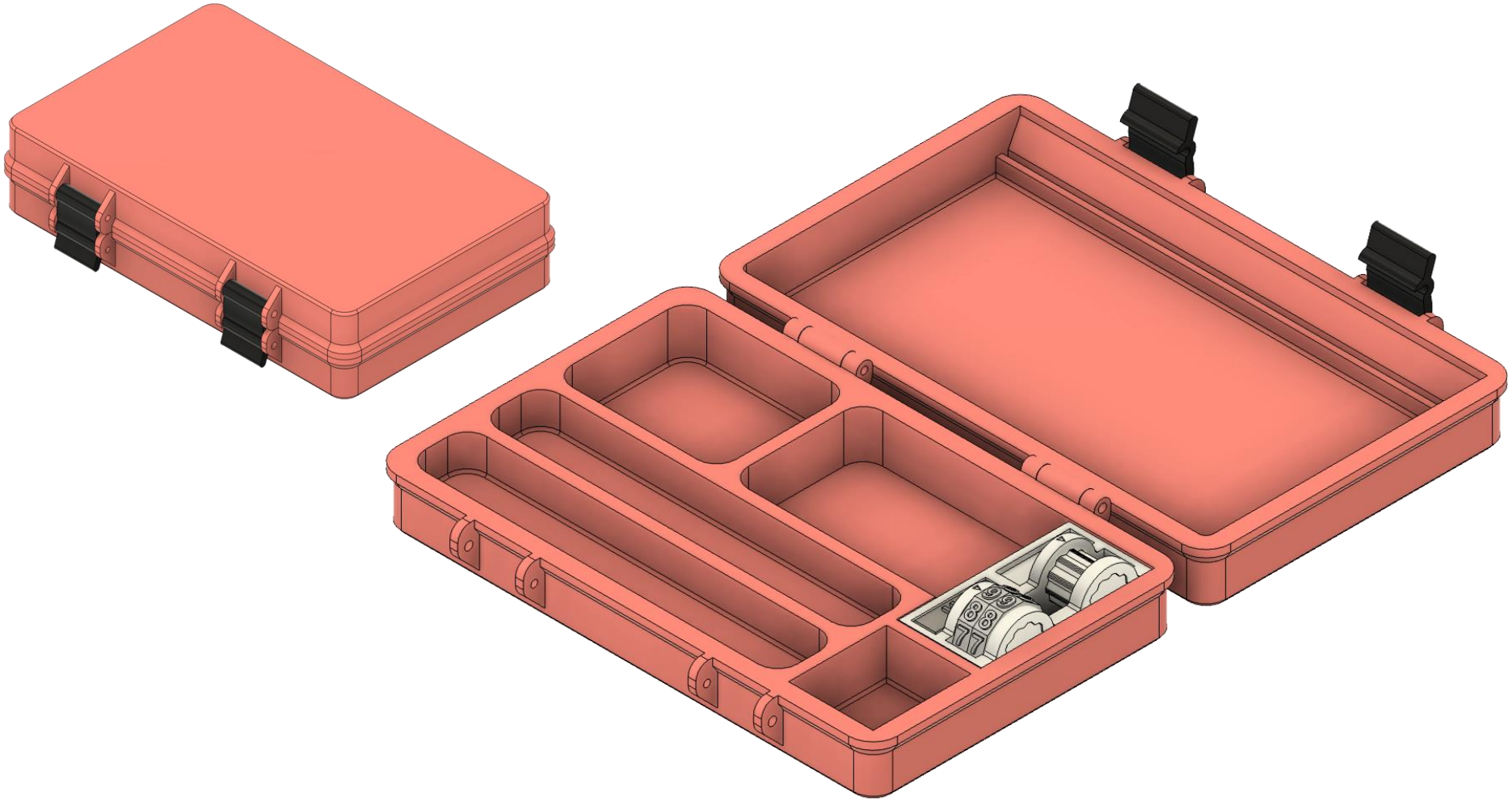
Fab: Laser cut wood; 3D printed joining pieces

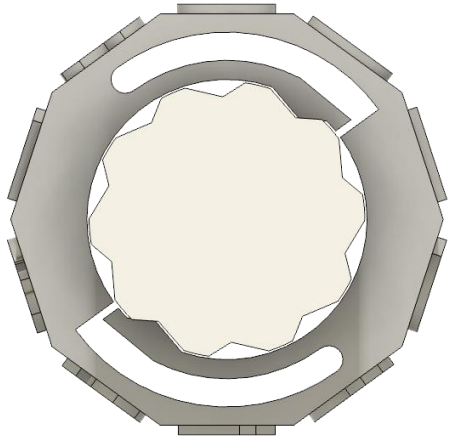




Desktop Tool Holder

Goal: Store commonly used tools in my PhD project
Fab: 3D printed with PLA
Notes: Objects sized and arranged to fit on the board; didn't have a caliper to measure the caliper so that was the most annoying part

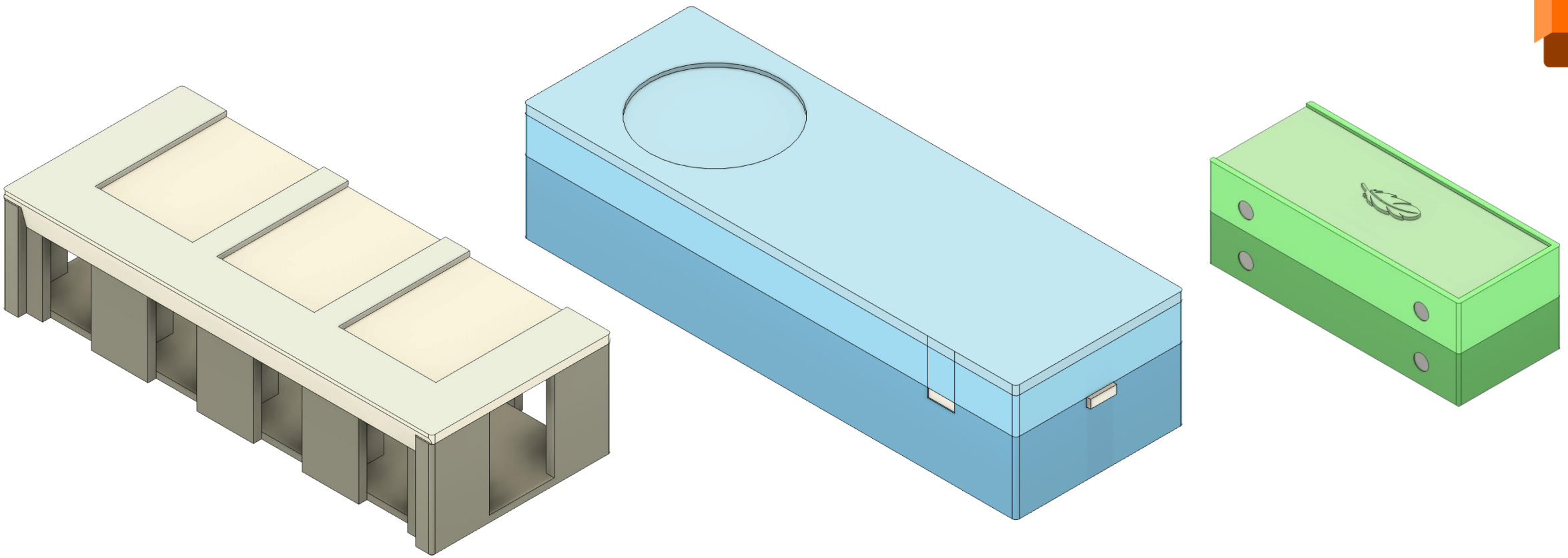




Tracker rings: locks in place using a compliant mechanism

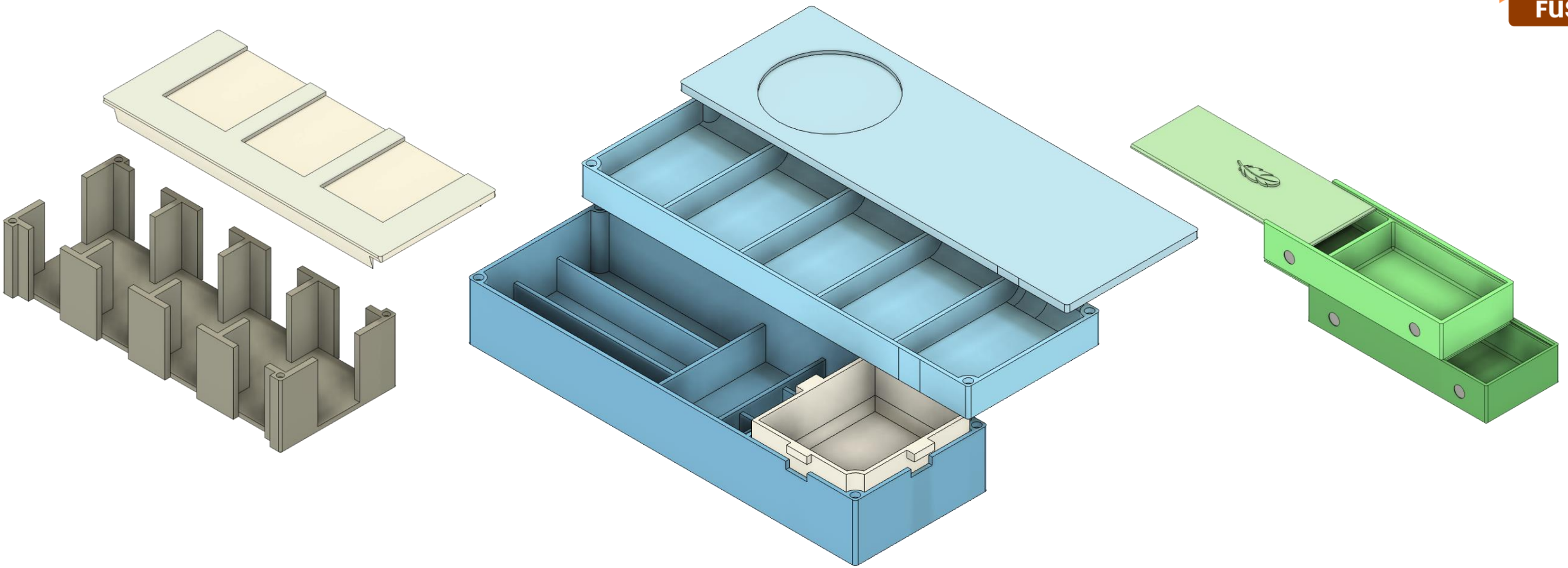
DND Minis Box

Goal: A box with latches to store minis, dice, and tracker rings for game-related information.
Fab: 3D printed joining pieces
Notes: I designed and printed this for the players and I intended for the lid to be able to function as a dice rolling tray.



Wingspan Board Game Storage

Goal: Different storage solutions for the pieces that come with the board game Wingspan.
Fab: 3D printed (PLA) with magnets



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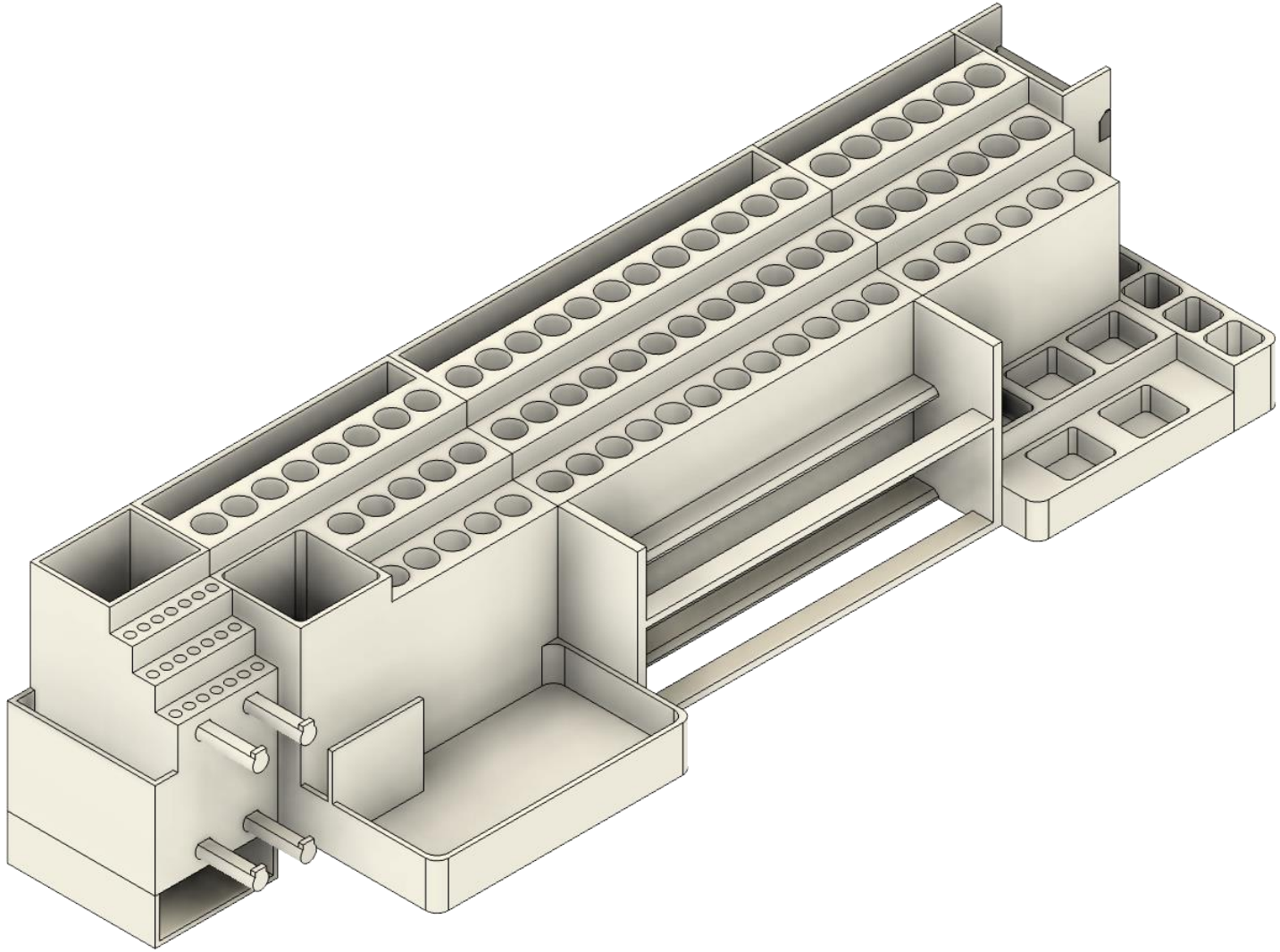

Stationery Holders

Goal: Store and display my stationery (pens, stamps, tape rolls, etc.)
Fab: 3D printed (PLA