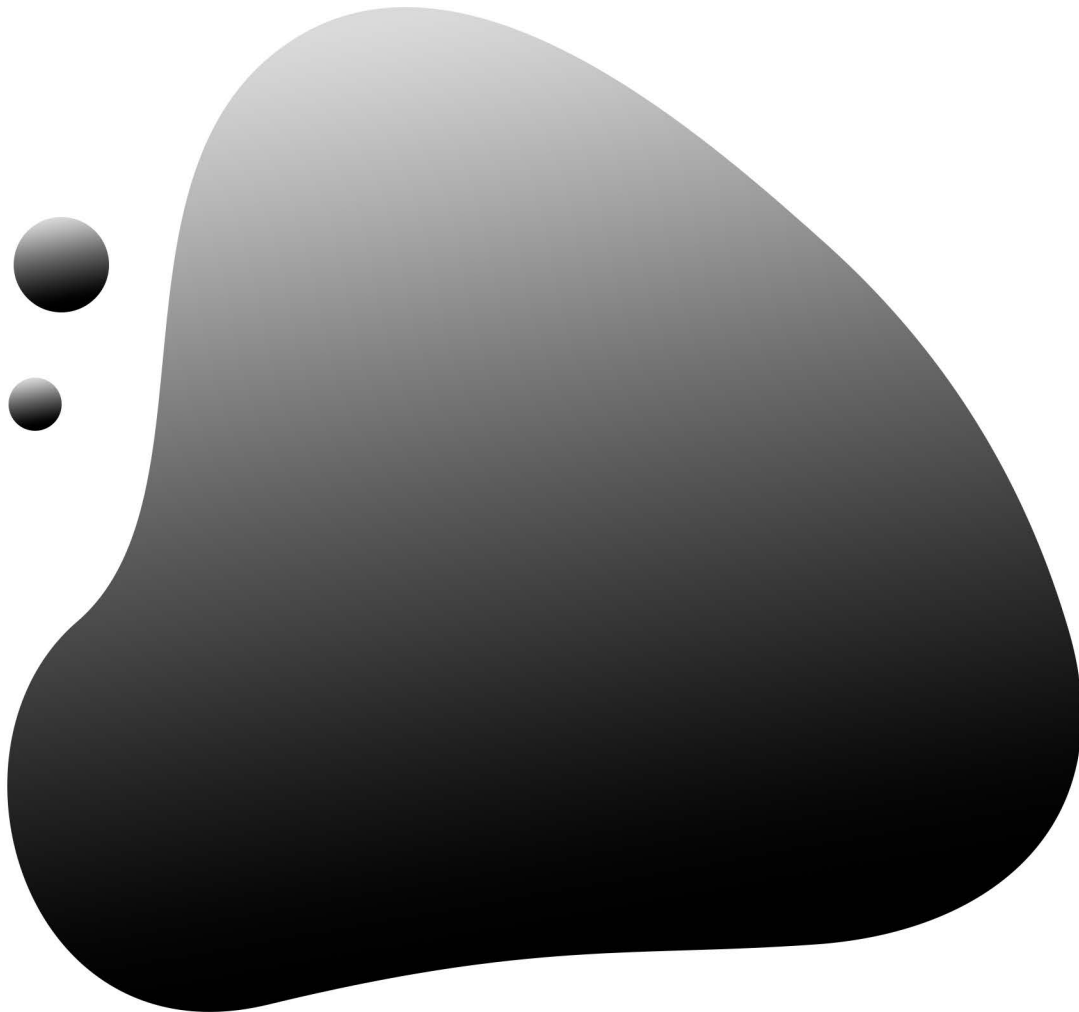


Samuel Robinson

Design Portfolio

2025



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Knee-Bike Crutch Hybrid Assistive Device



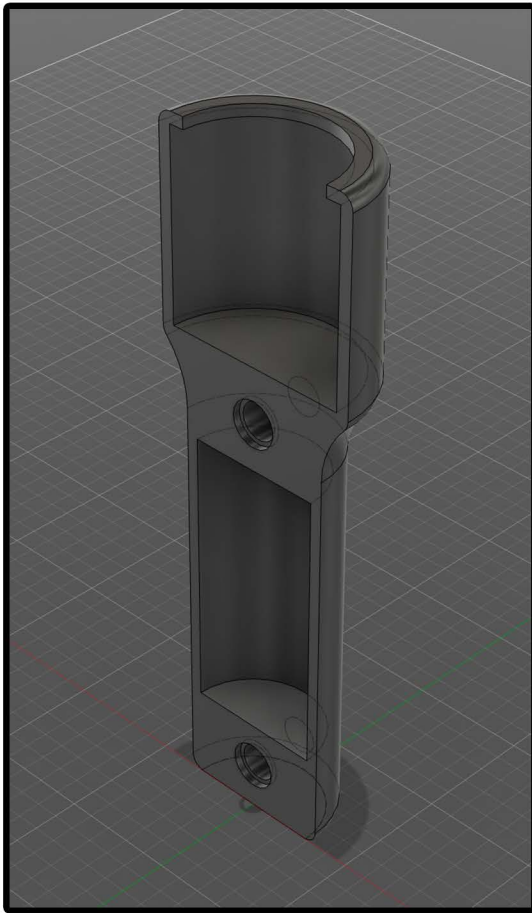
- Above shows the device's **functionality**, where it can both serve as a pair of crutches and a knee bike depending on the user's needs and terrain. The intent was to make a **versatile device** that could serve many situations.
- Below shows how the device folds. Under the knee rest, there are **folding mechanisms** for transitioning it to the crutch mode, the crutches also adjust down through a specialized part on the right which was **3D printed**.



Umbrella Handle CAD Upgrade

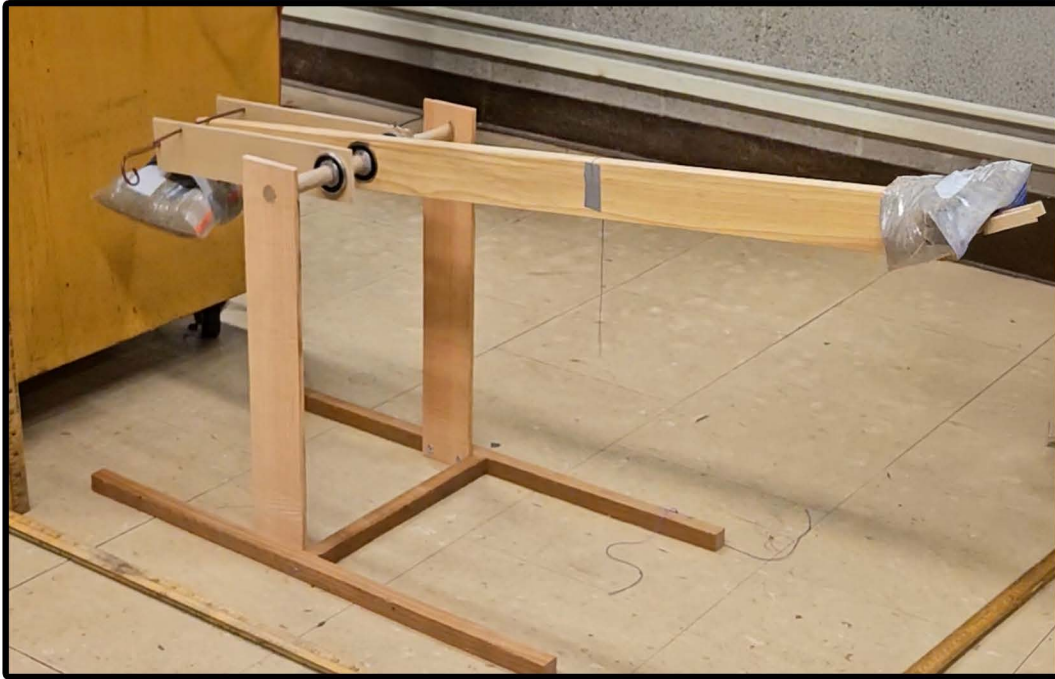


Problem: Hard to hold

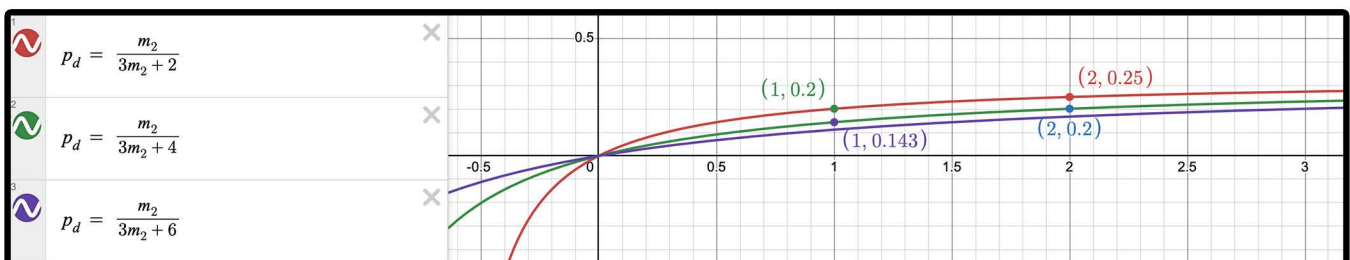
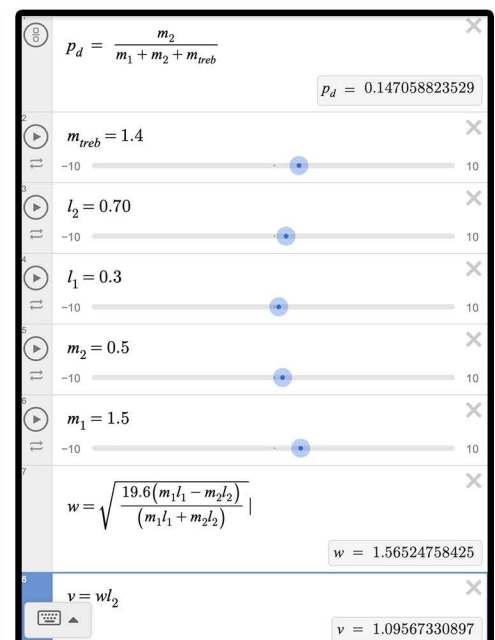
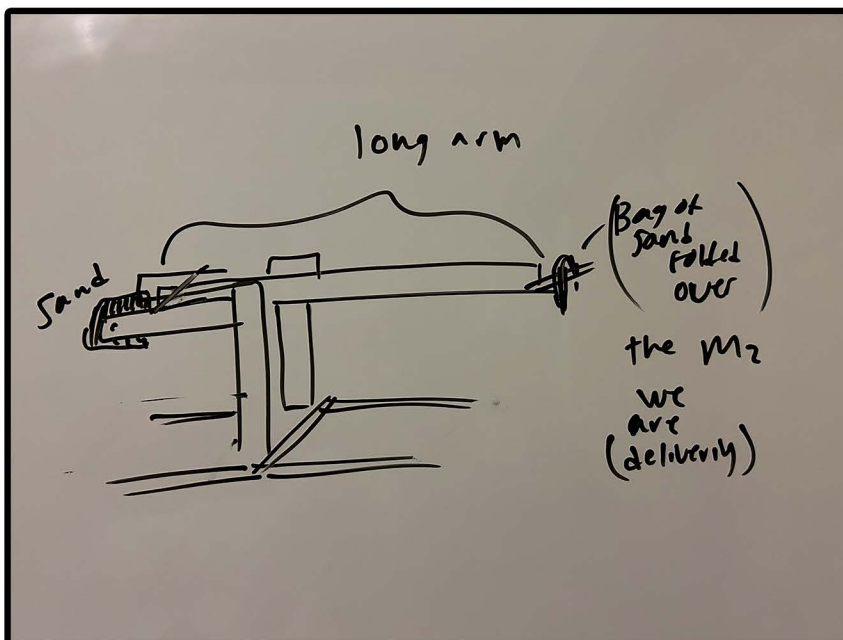


- Above shows the **CAD design** I modeled using **Fusion 360** to 3D print. I intended to design it so it could print 2 separate parts and not fail while printing. It was designed to fit around the existing handle and be assembled using 2 screws and 2 inserts.

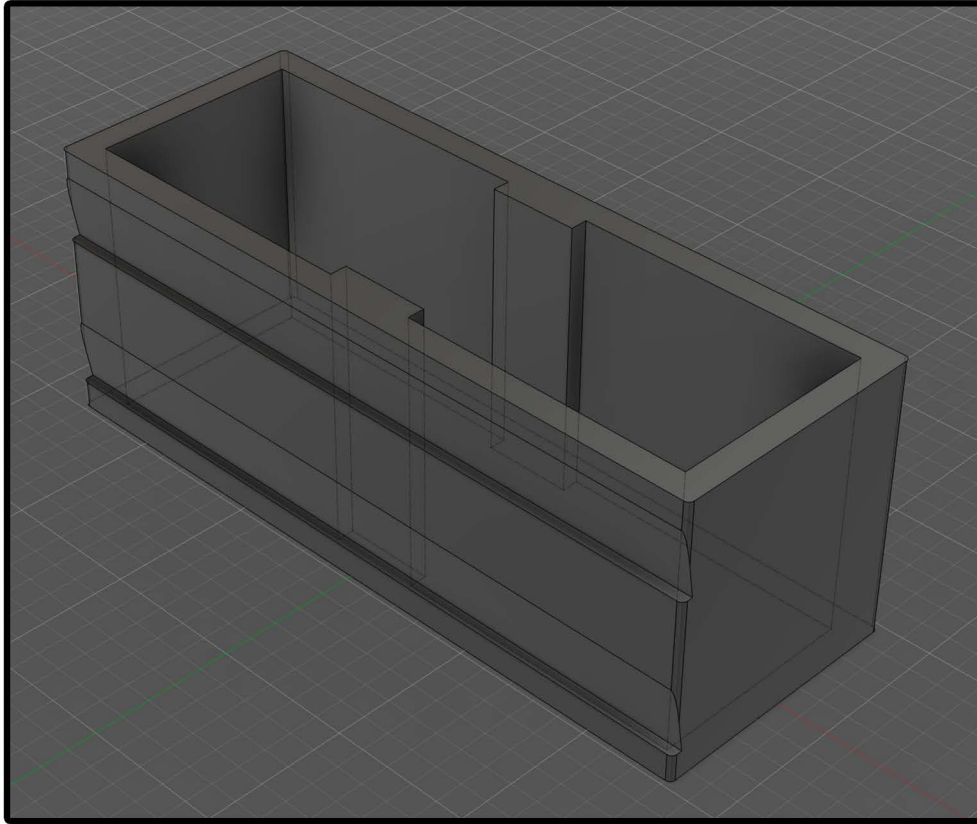
Optimized Mass Transfer Machine



Below shows an initial sketch that shows my ability to **translate a drawing into a reality**. It was drawn in the final stages of design before building. The Desmos images show my ability to use **mathematical modeling** to optimize a design.



Outlet Accessibility Mini Design Project



- This design **addresses a common household issue**: an inconveniently placed outlet. The extension cord, serving as a hub for multiple plugs, had limited reach. By integrating the table into the solution, it securely holds the cord against the wall, **keeping it stable and easily accessible** for use.



- This project highlights my **problem-solving skills** and ability to come up with **creative solutions** using CAD and 3D printing.