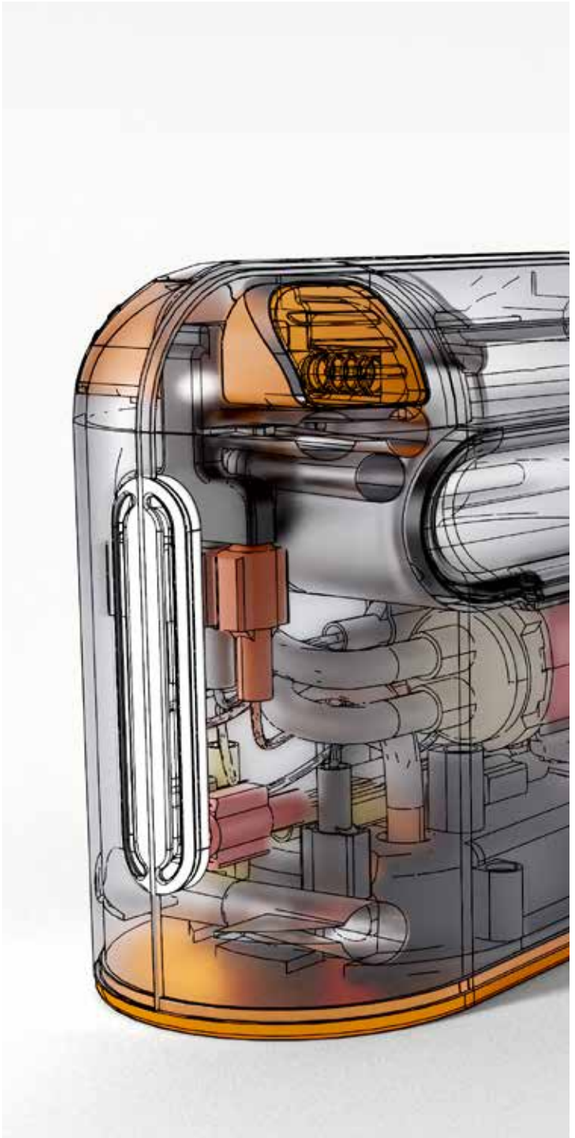
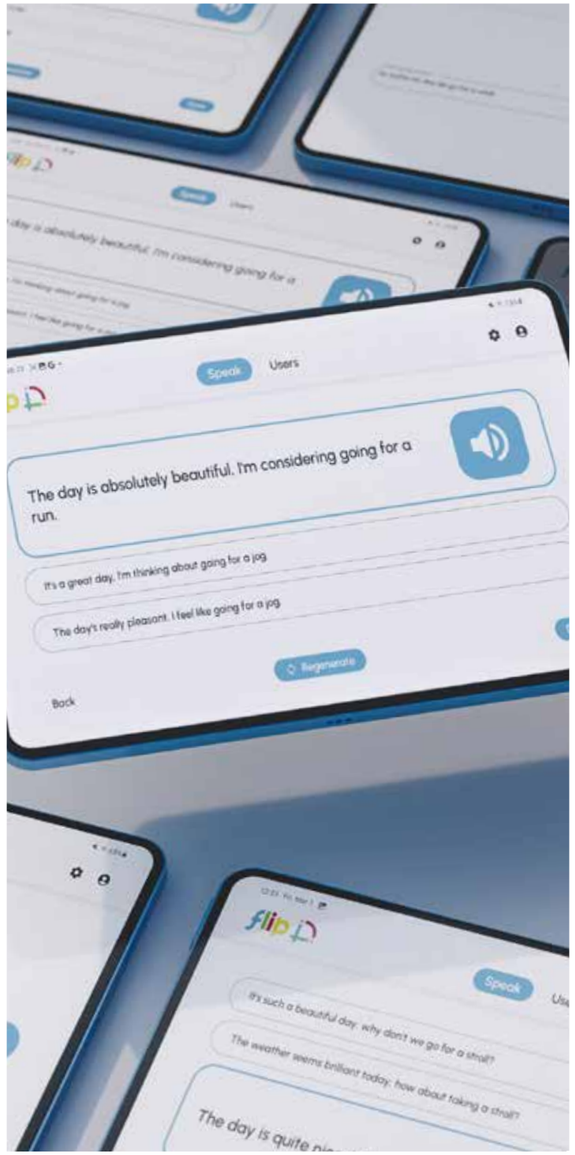
Domenic Gallo

Industrial Design Portfolio



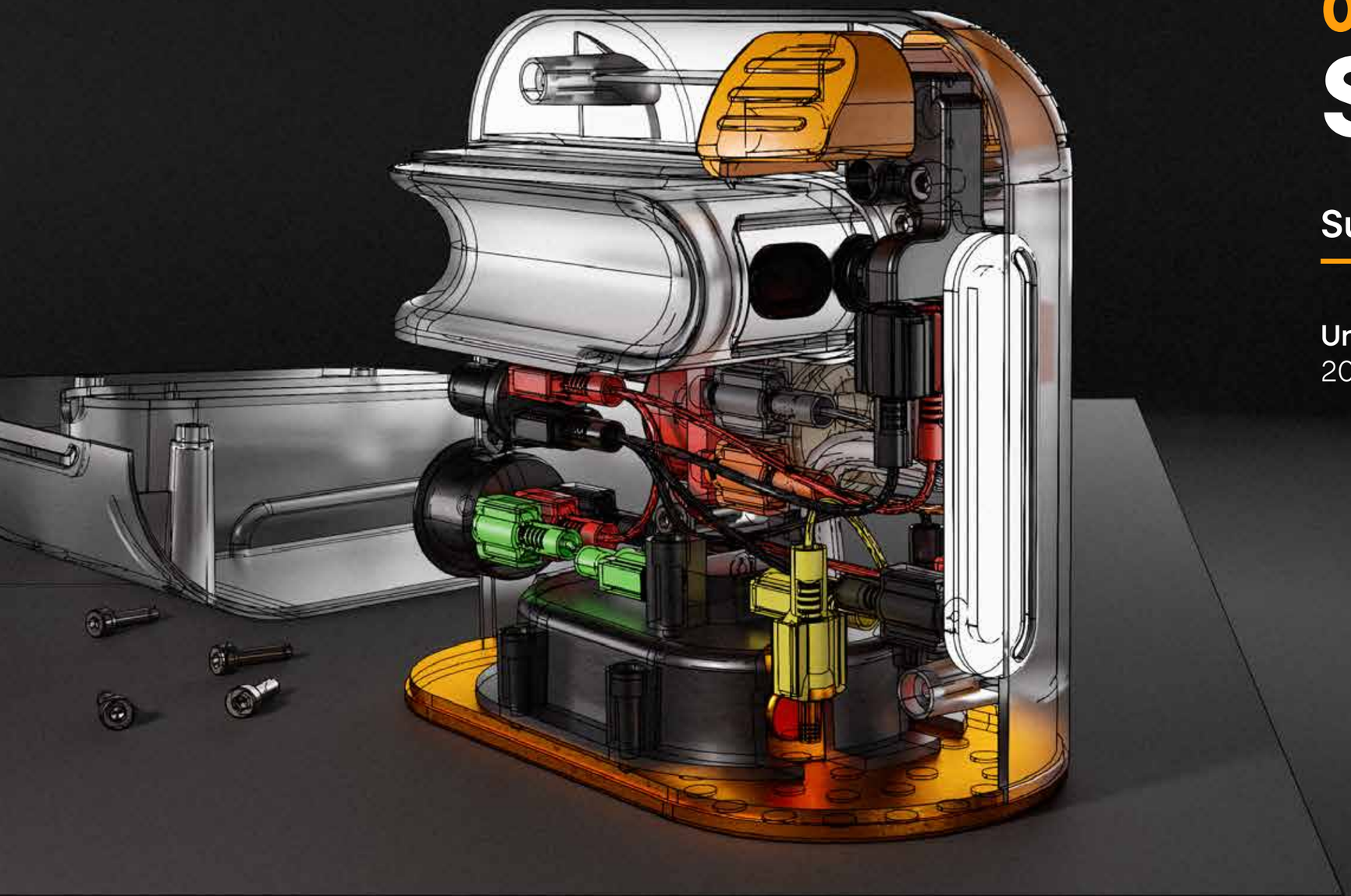
01 **STMR_01**
2023



02 **Flip AAC**
2023

03 **The Farm**
2023

04 **Equilibria**
2023



01

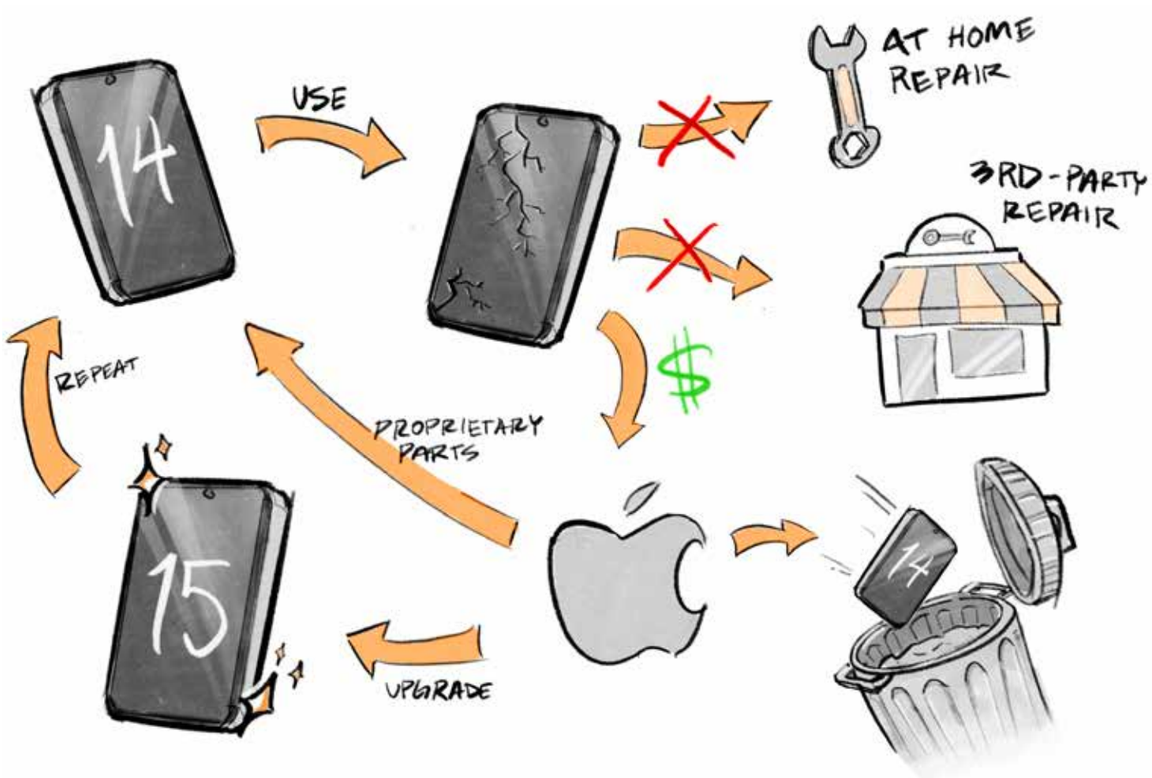
STMR_01

Sustainability Via Longevity

University Project | 3 Months
2023

When does a product become waste?

Product systems that scoff at sustainability create users who do the same.



7 Million Tons

of E-Waste is produced in the US annually.

86% of Users

reported that they discarded a digital device due to a potentially repairable issue.*

Most Products

systematically experience premature or planned obsolescence.*

Companies stand to profit substantially from product systems that disincentivize sustainable repair practices.

By encouraging users that "broken" devices are irreparably damaged and should be considered waste, companies can ensure consistent success with sequential product releases.

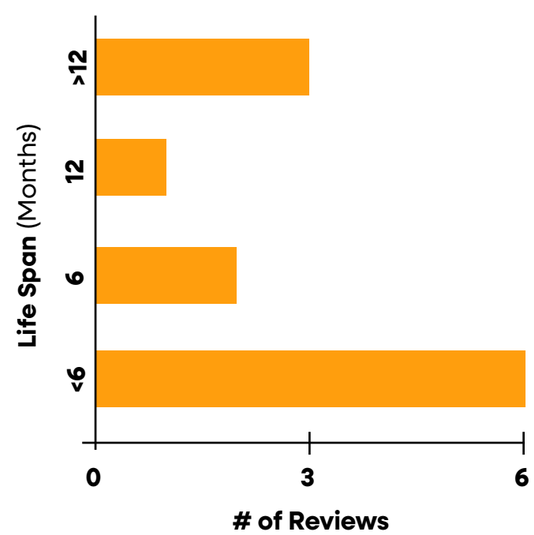
*According to studies conducted by the European Commission in 2020

Hometop
Steamer Iron

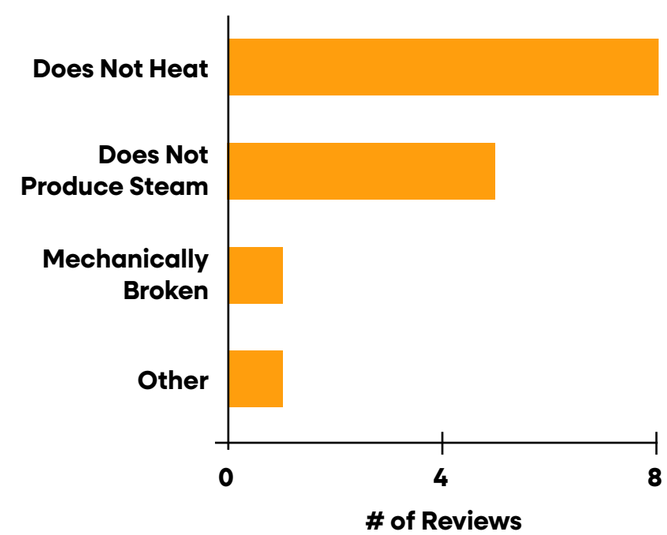
A case study on premature obsolescence and throw-away culture.

Online reviews showed the product life span was shorter than expected with potentially repairable causes of failure.

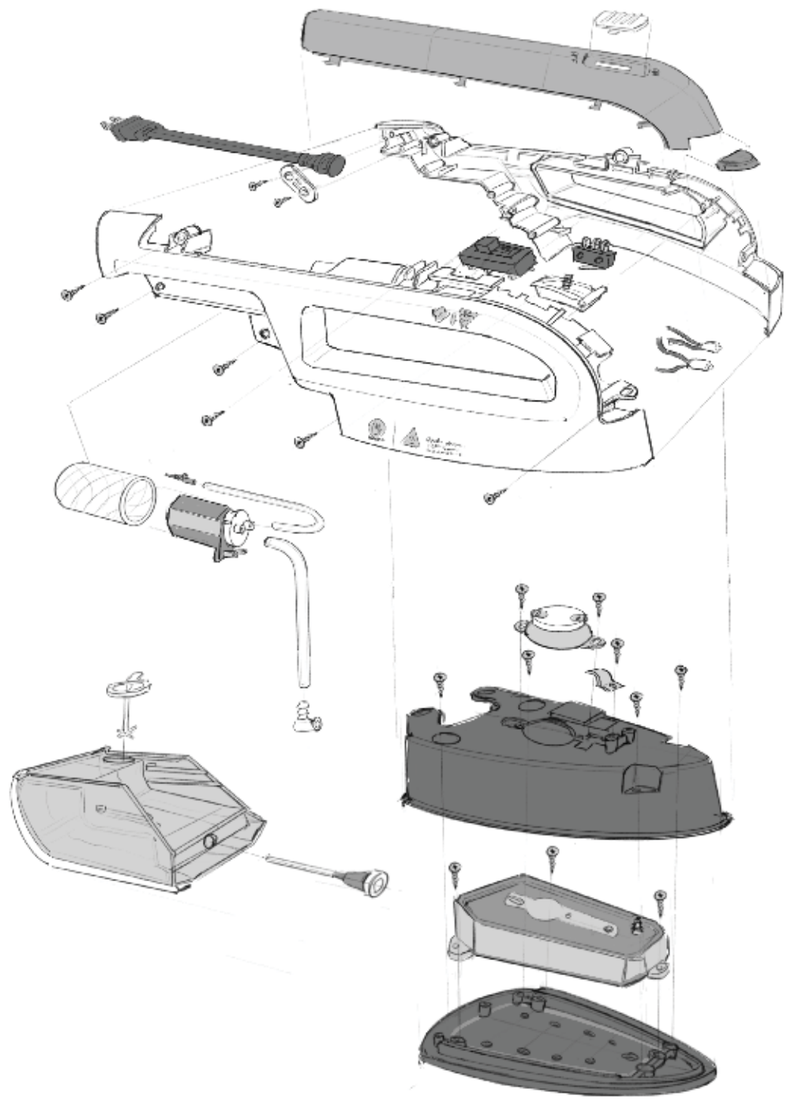
Lifespan
of the Hometop Steamer Iron

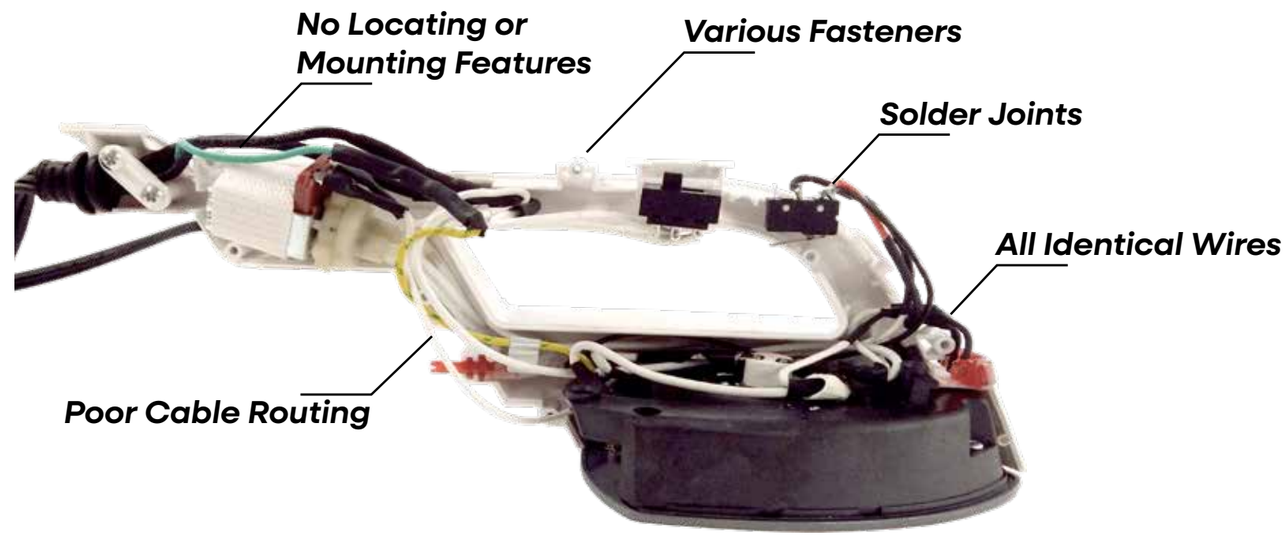


Cause of Failure
of the Hometop Steamer Iron



Not meant to be repaired.





The simplest way to reduce impact is to make less.

An Okala Life Cycle Assessment (LCA) was used to analyze the product's environmental impact in its production, use, and end of life.

The LCA revealed that because raw materials are the most impactful component, the best way to improve sustainability is to design a system that leads to less products being manufactured.

97% of impact was attributed to **raw materials.**

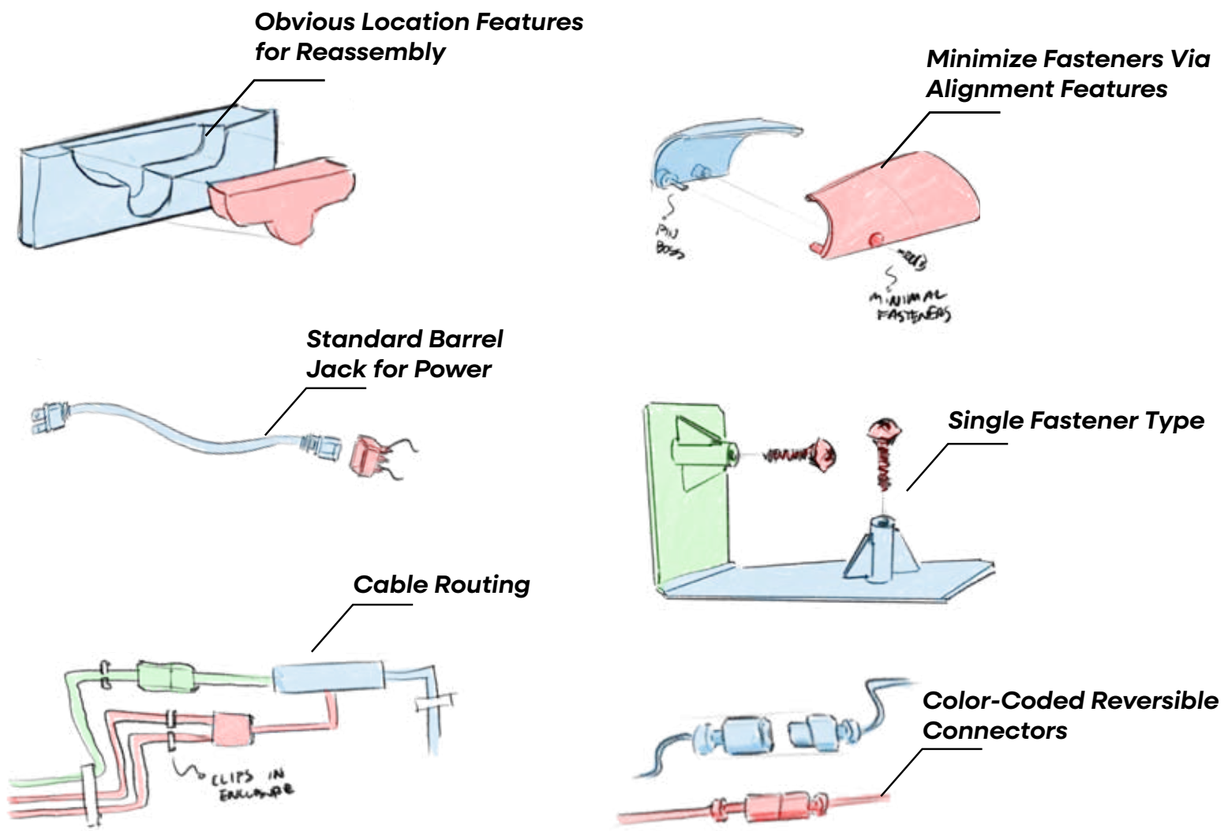
End of Life impact was **Negligible.**

All consumers have an intrinsic Right to Repair.

The ability to repair, refurbish, trade, and modify are fundamental rights of product ownership.

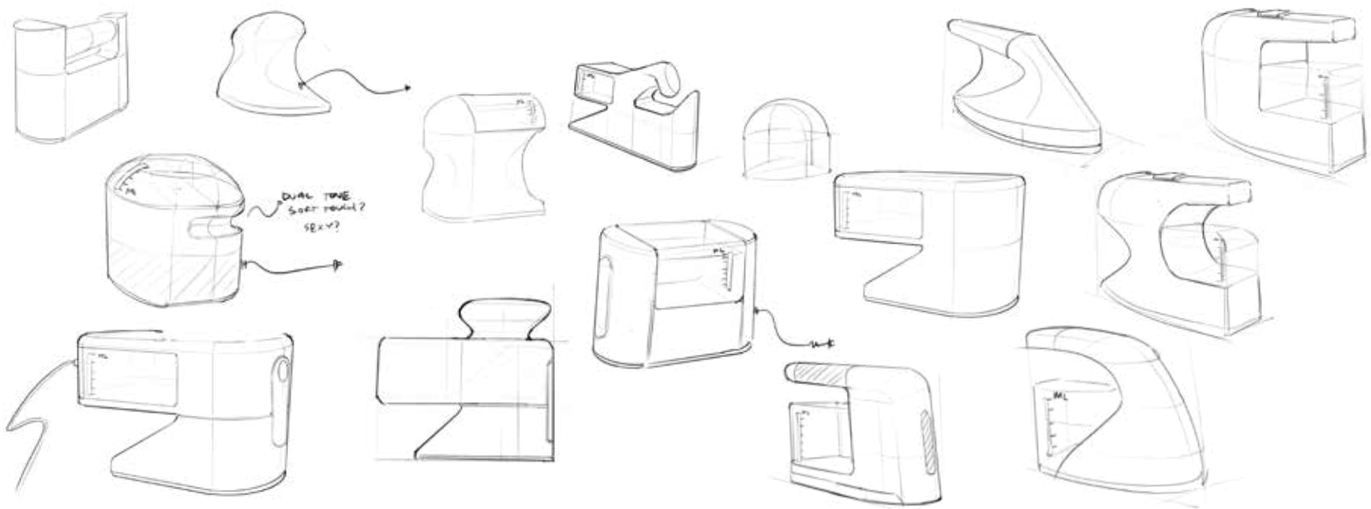
Design strategies for improved repairability...

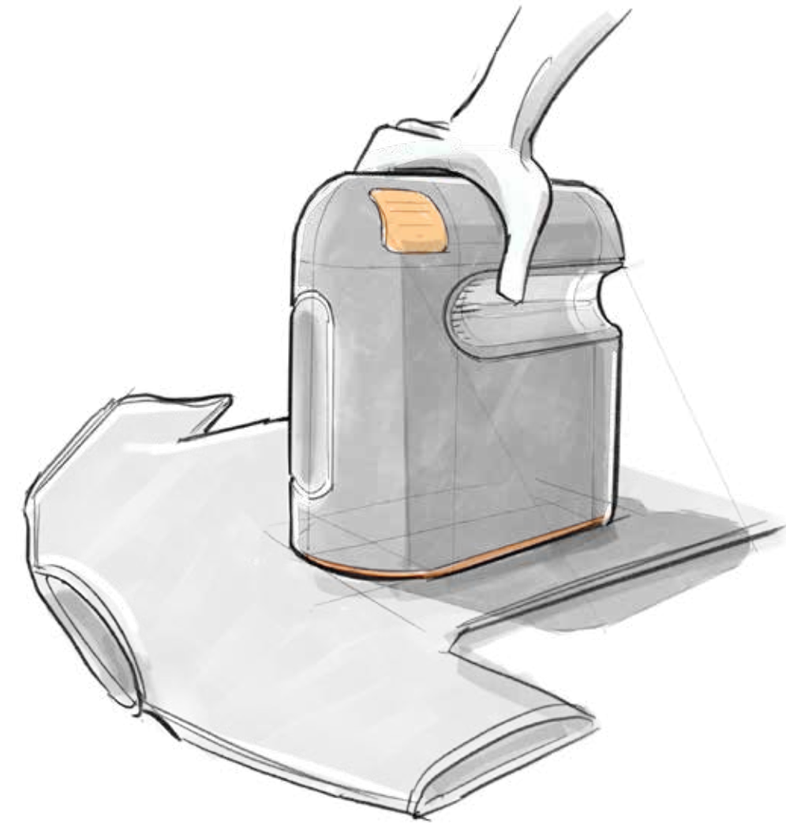
Helping the user approach repair by lowering barriers to entry and anticipating points of conflict.



Exploring and Validating Ergonomics

Assessing form factors and considering a variety of user interaction solutions.

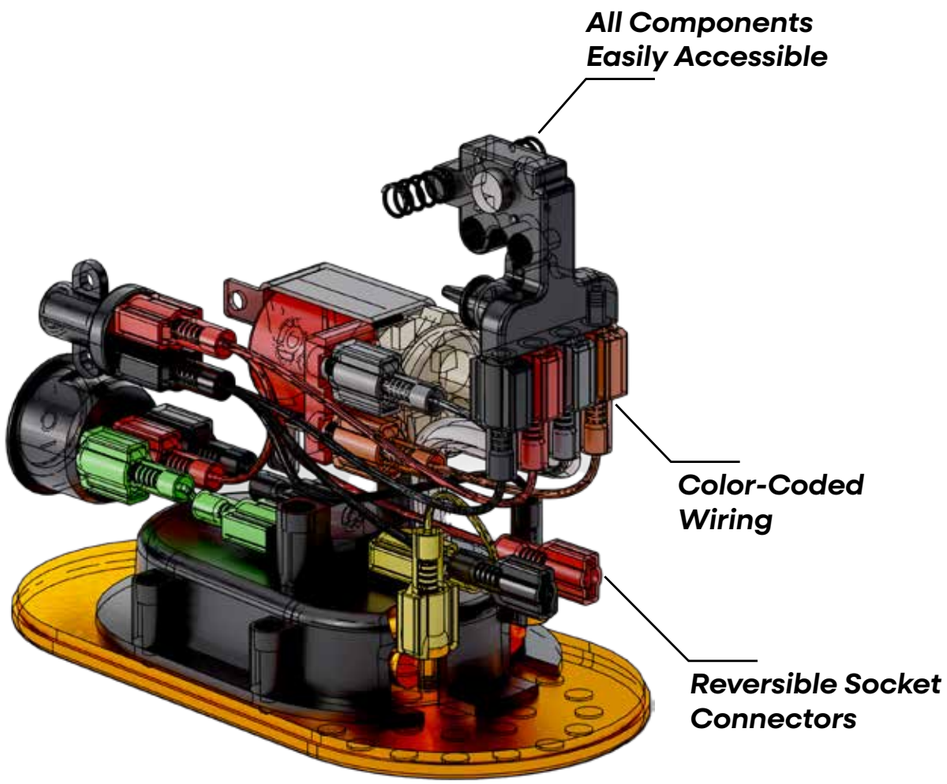


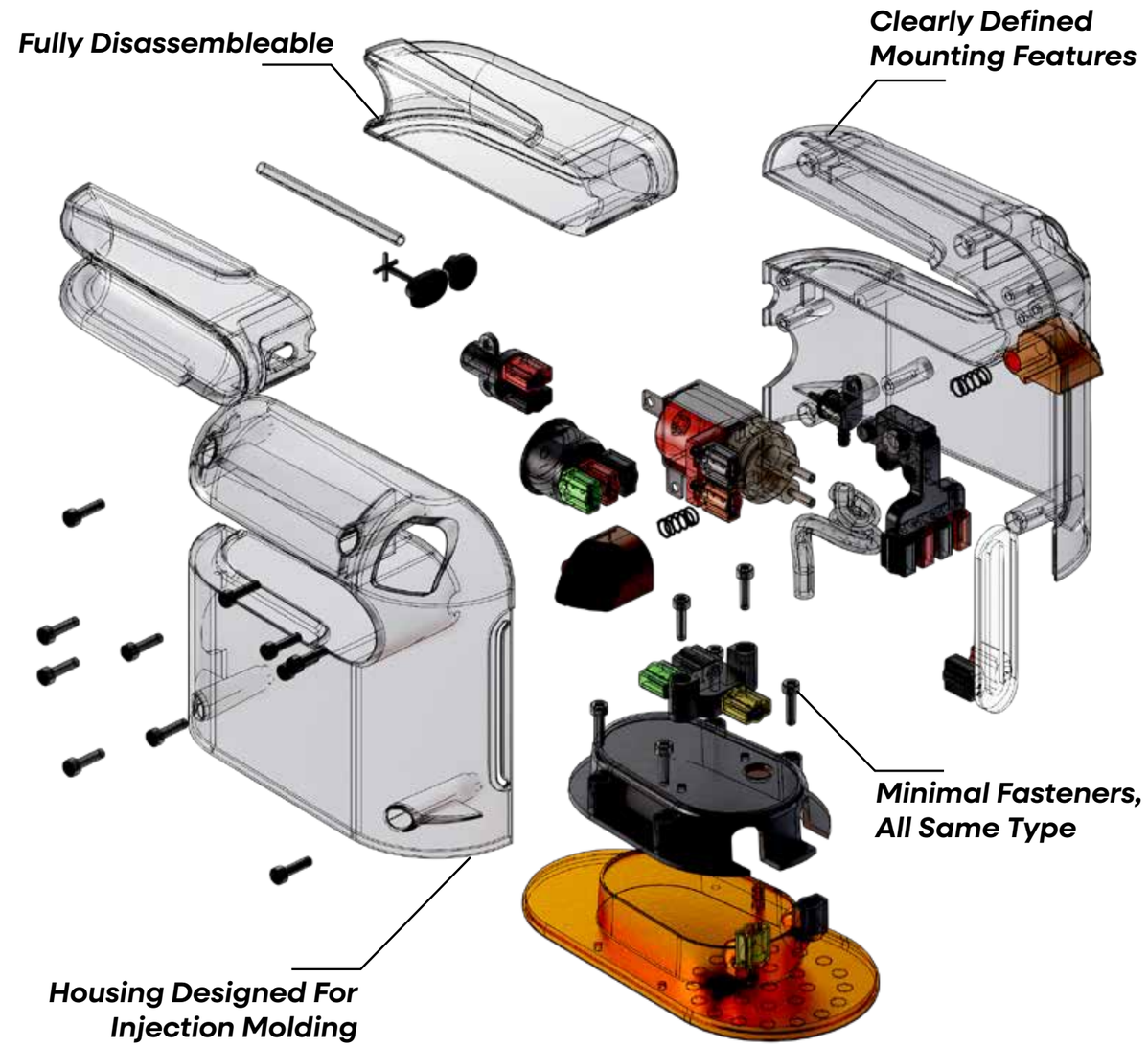


The semi-transparent housing invites the user to discover the inner workings of the product.

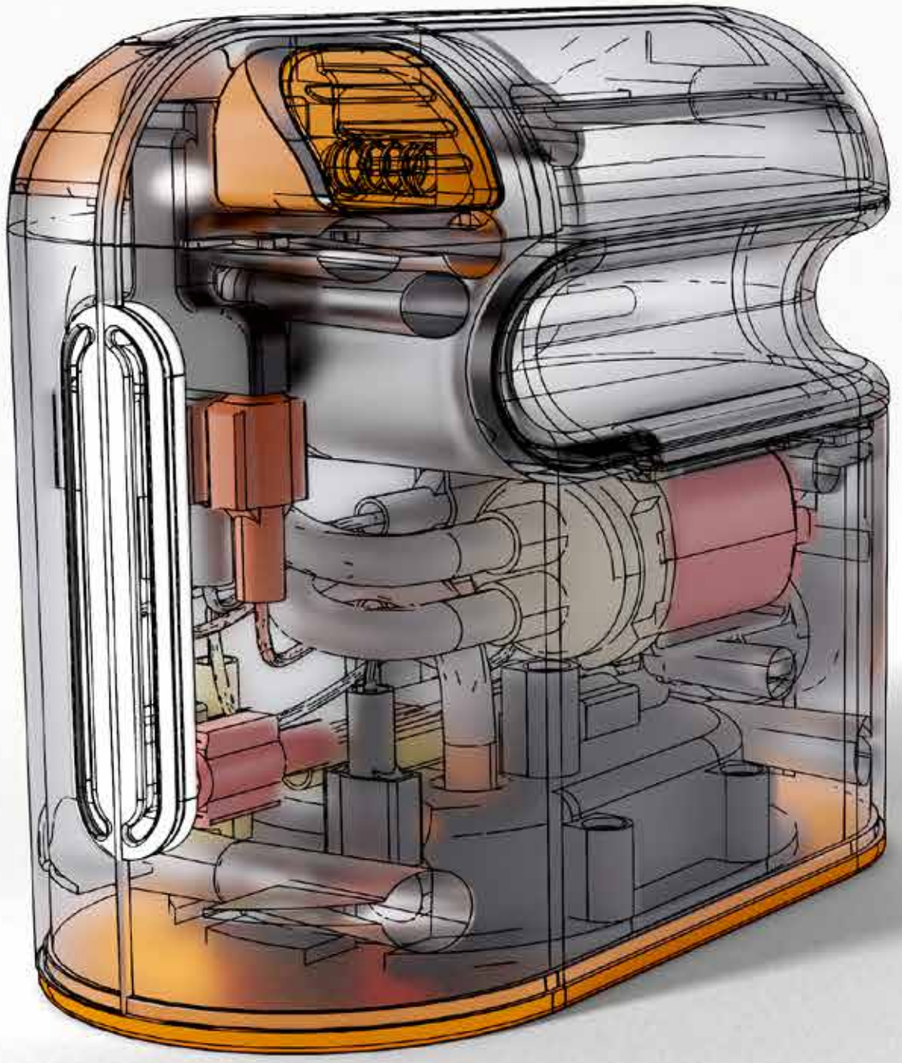
Demystifying the product's functionality increases the user's likelihood to engage with repair.

Manufacturable.
Functional.
Repairable.





Designing the user's relationship with the product.



By lowering barriers to entry, we can provide users with the confidence to engage in repair and guide them toward more sustainable behaviors.

02

Flip AAC

Re-imagining Assistive Language Technology

University Grant Project | 12 Months
2023

What is an AAC device?

Alternative & Augmentative Communication (AAC) devices are tools for assisting people with expressing speech.

Some common AAC tools include Sign Language, Braille, and Alphabet Boards.

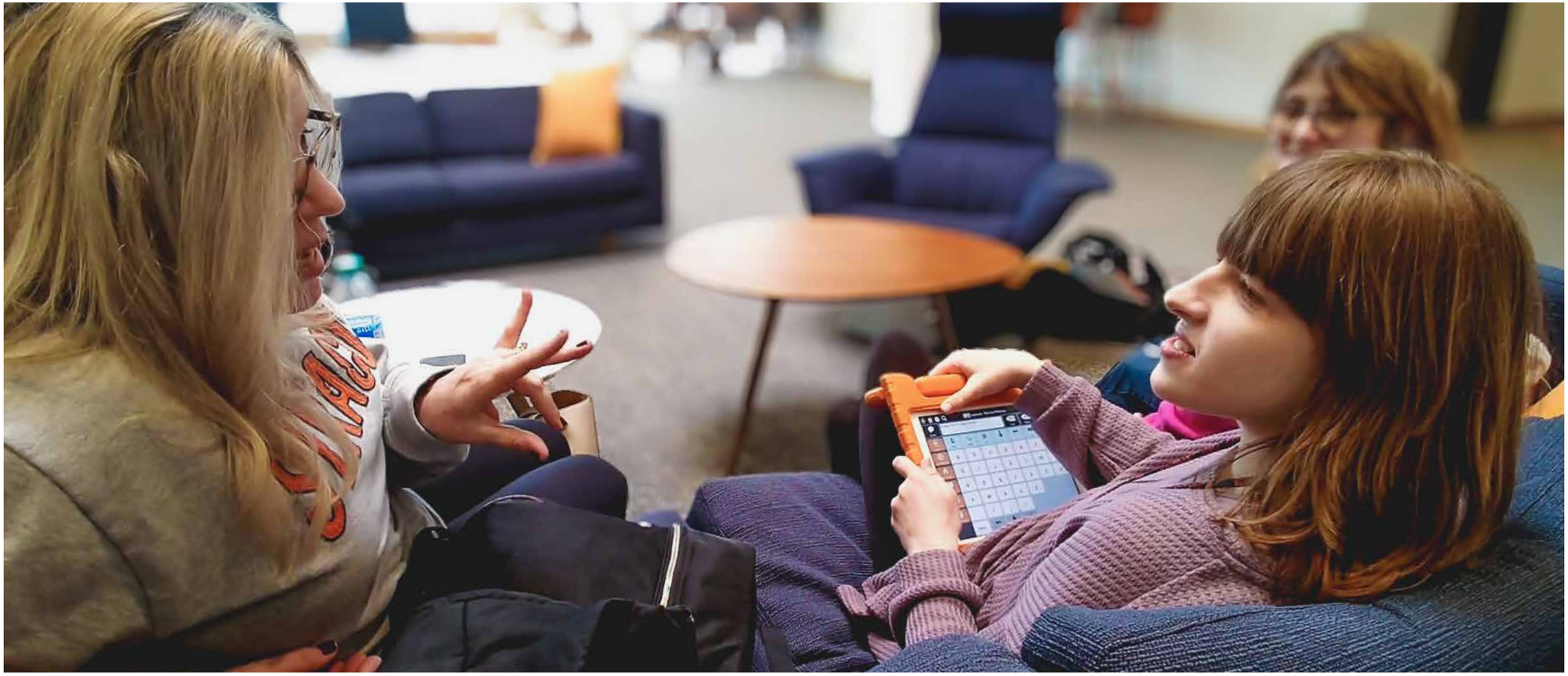
AAC apps are tool which allow users to generate text by successively pressing buttons on a screen. This text is then vocalized with text-to-speech.

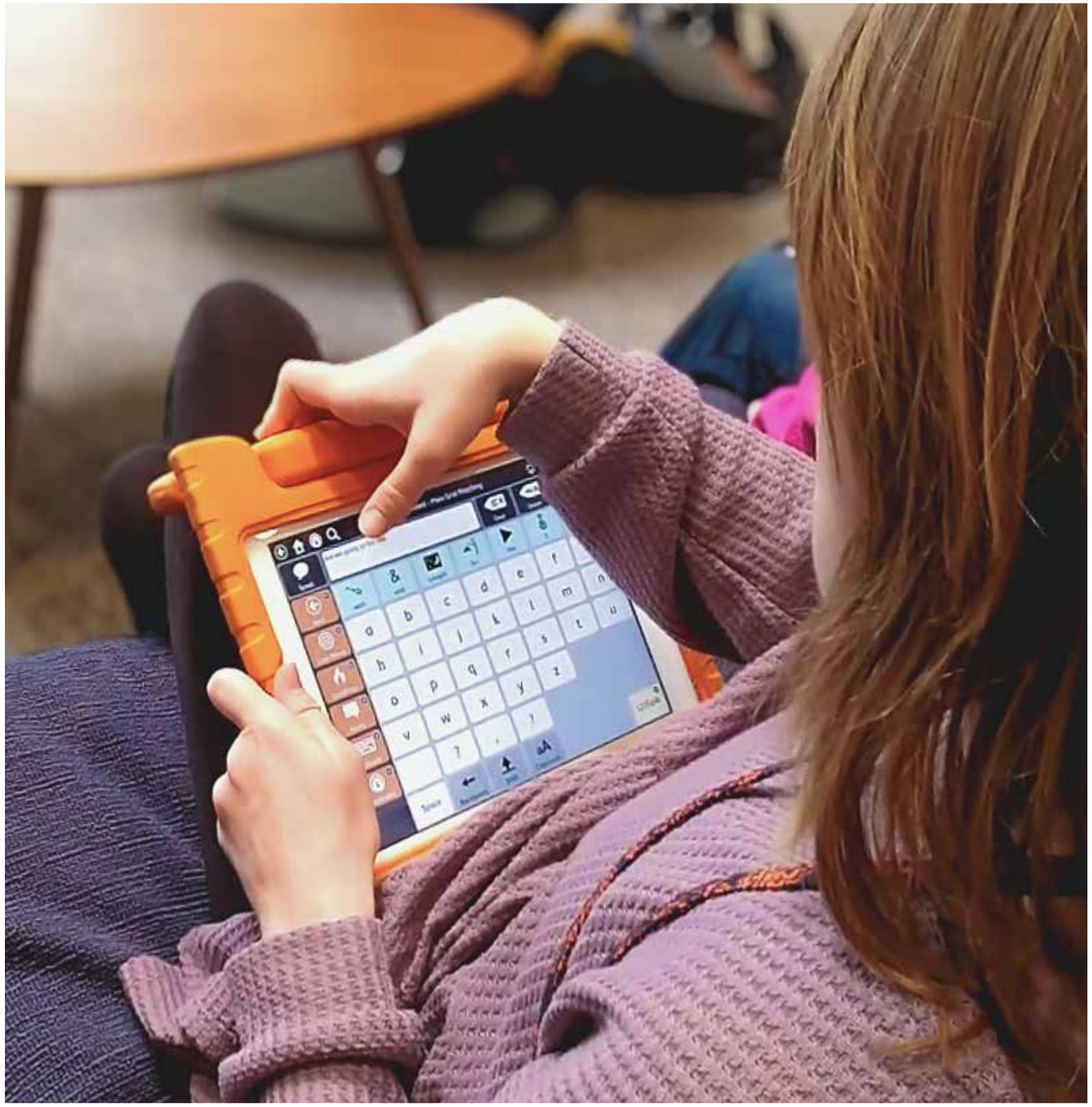
This is Maia.

Maia is non-verbal due to her intellectual disability. She works with her mother & AAC devices to speak verbally.

Maia has a unique method of speech: a hybrid of ASL, typing, and paralinguistics. Maia's mother translates her speech into verbal language, fit with all the complexities of her personality.

Their success demonstrates the opportunity to develop a tool that addresses the emotional, personal depth of speech.





AAC limits efficiency & expression.

Reliance on text input as the single modality of speech is inherently limiting.

Speaking with Maia helped me understand the shortcomings of current AAC technology, especially in its ability to facilitate expressing one's identity and emotions.

Facial Expressions

Para-linguistics

Body Language

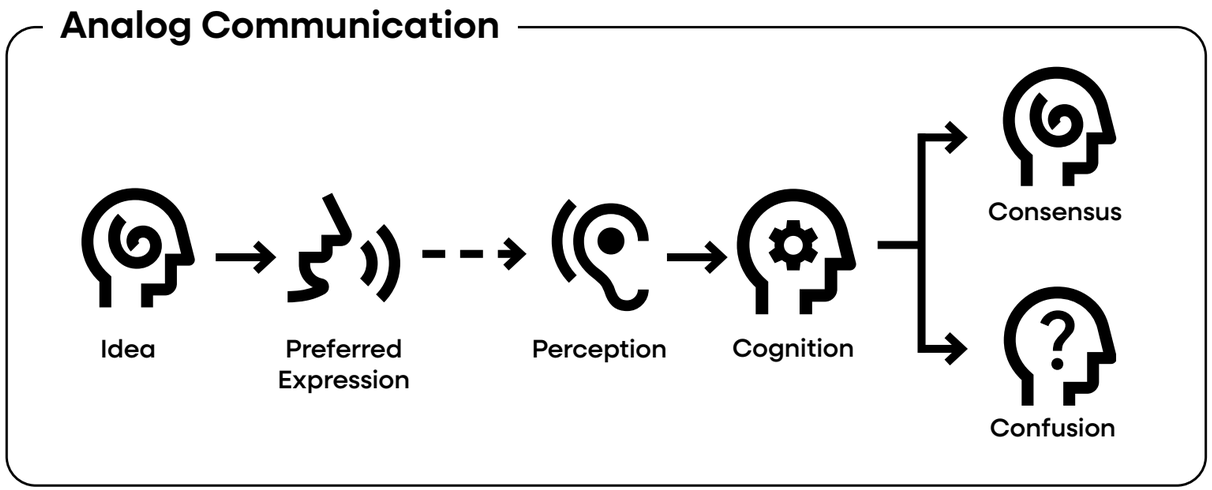
Eye Contact

Appearance

Proximity

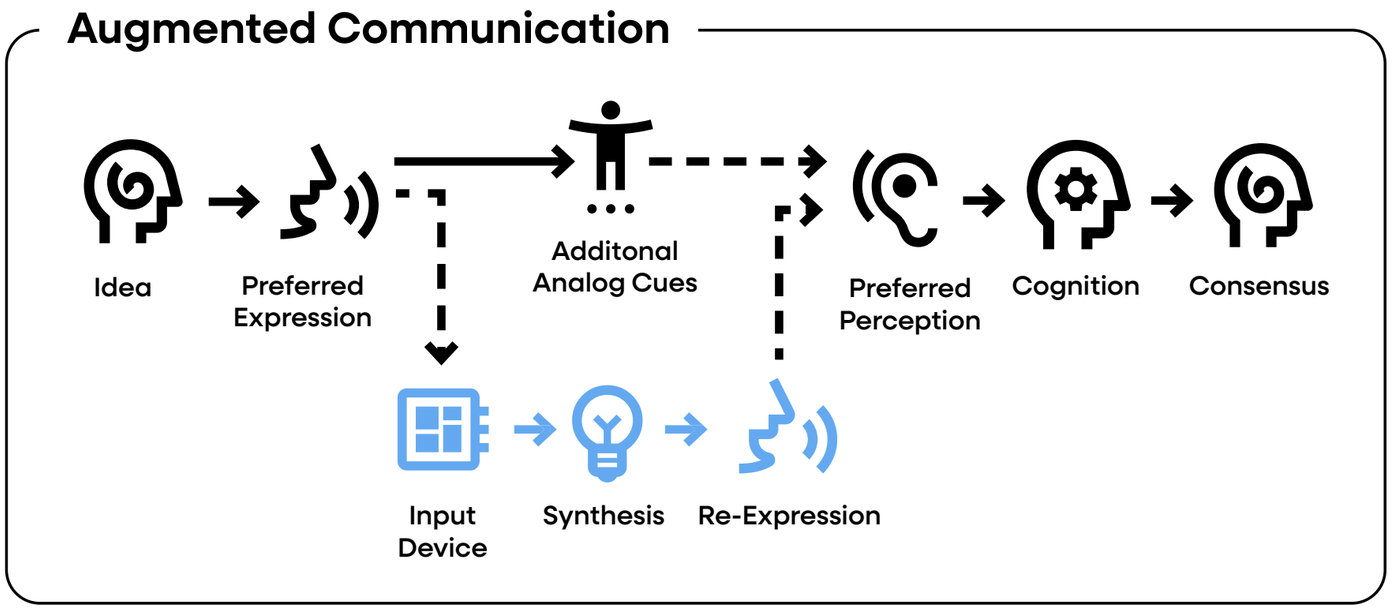
Gestures

Haptics



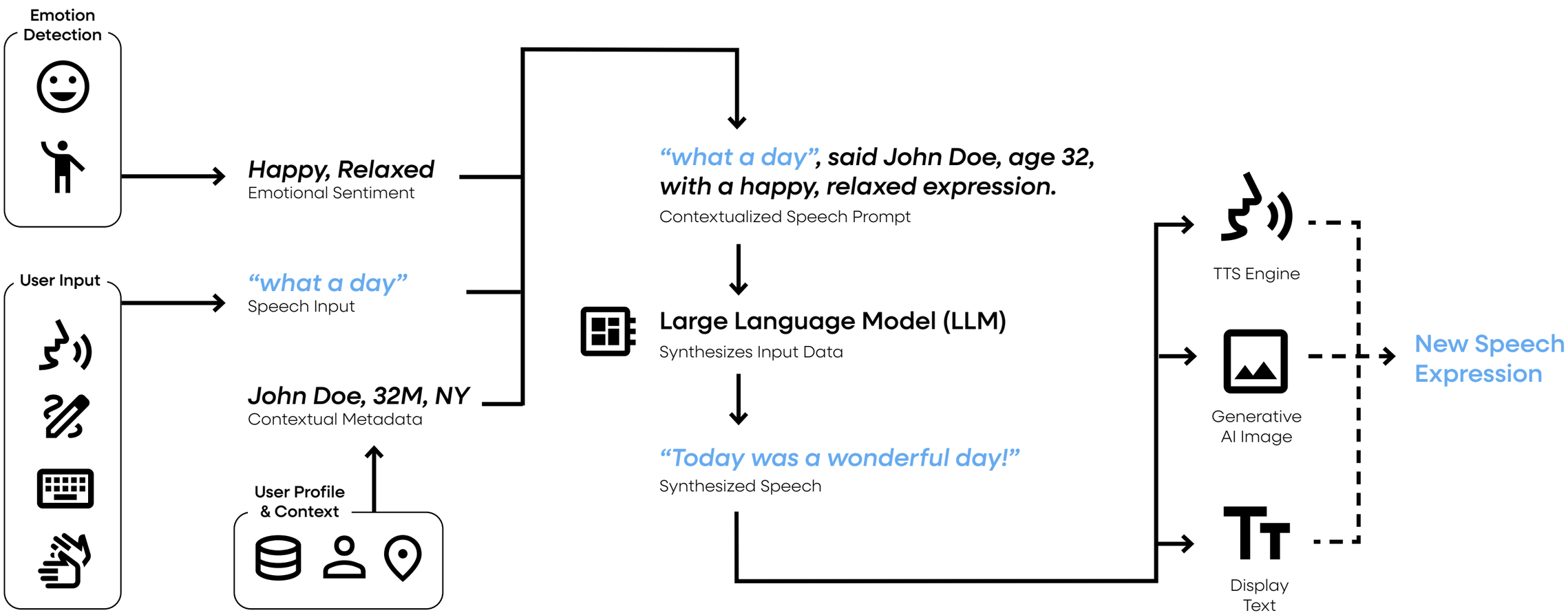
The human mind is notoriously ambiguous.

Everyone has their own schema for how they interpret the world and express themselves. How can we work around this?



Augmentation is the answer.

Ambiguating concepts in speech allows for translation to a new form of expression.



A model for intelligent speech translation.

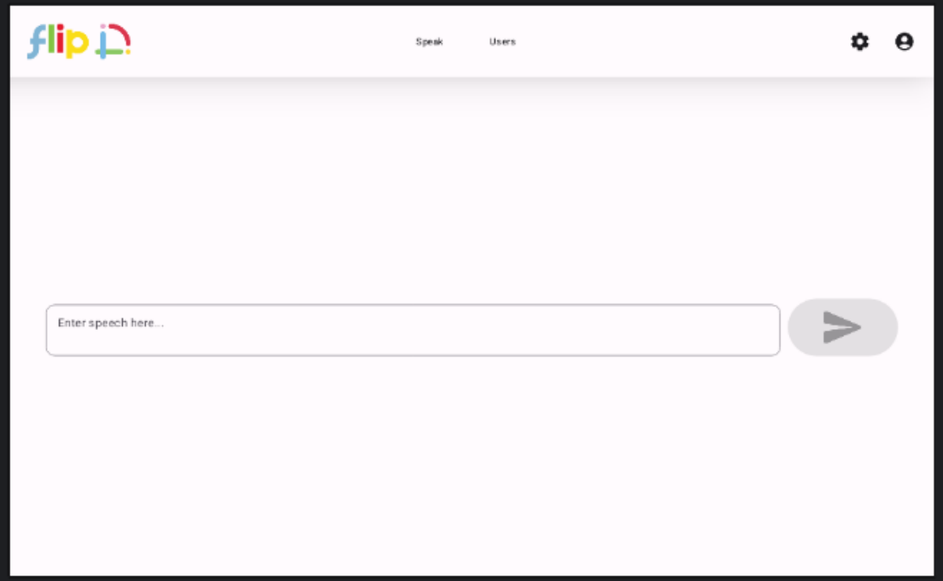
Using emerging technology to expand speech assistance.

```
import ...

@OptIn(ExperimentalMaterial3Api::class)
@Composable
fun MainScreen(){
    val navController = rememberNavController()

    Scaffold(
        topBar = { TopNavBar(navController = navController) }
    ){ contentPadding ->
        NavHost(navController = navController,
            startDestination = Screen.Speak.route,
            modifier = Modifier.padding(contentPadding)
        ){ this: NavGraphBuilder
            composable(Screen.Speak.route){ SpeakScreen() }
            composable(Screen.Users.route){ UsersScreen(navController = navCor
            composable(Screen.Account.route){ AccountScreen(navController = na
            composable(Screen.Settings.route){ SettingsScreen() }
        }
```

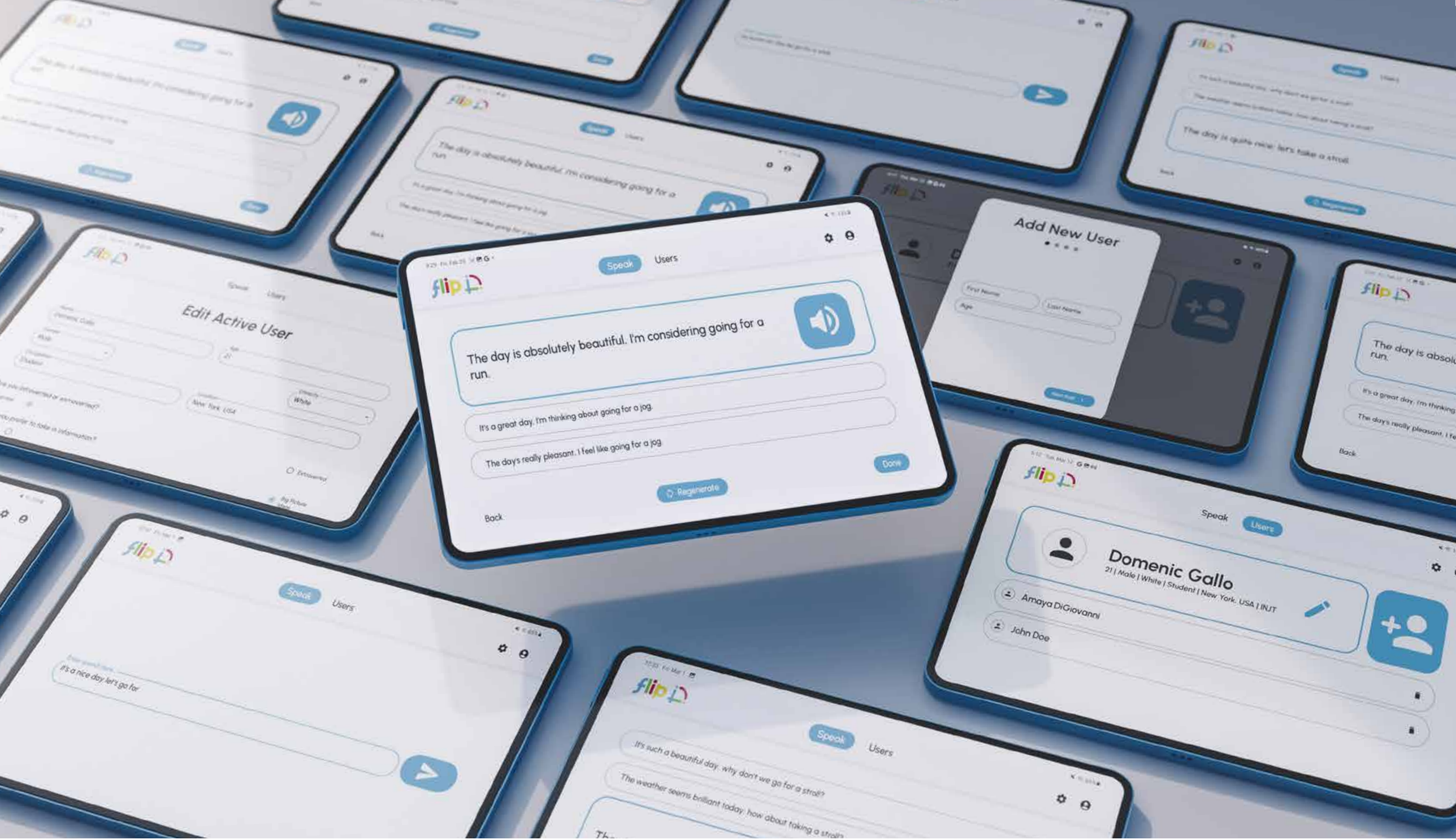
MainScreenPreview



Developing a functional prototype.

An internship at the Center on Disability & Inclusion at Syracuse University allowed me to implement these ideas into a working app.

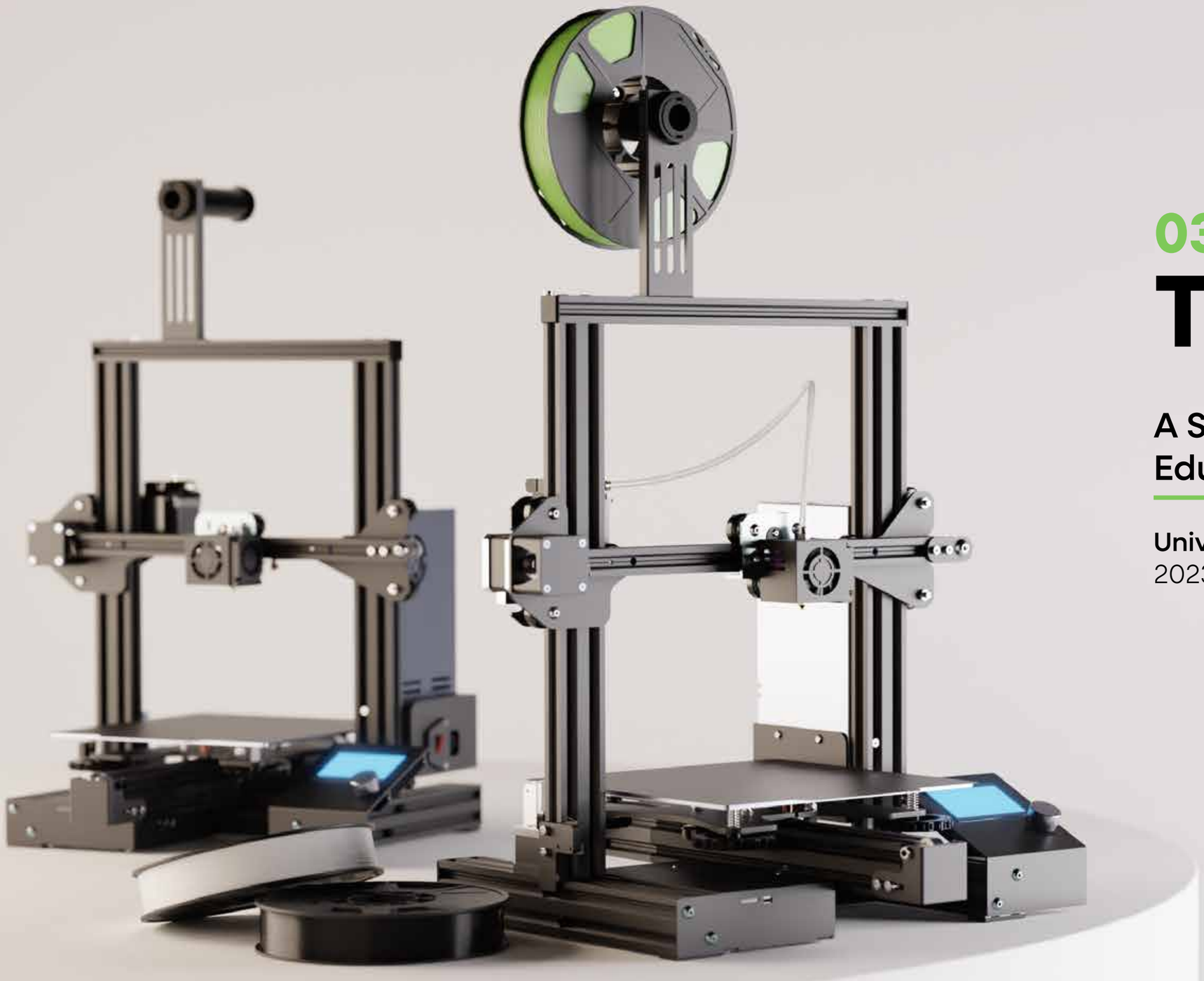
Using Jetpack Compose, Google's UI toolkit for Android app development, I created a prototype that interfaces with the OpenAI API, allowing for testing of the system.



Mockup Rendered with Blender

Speak freely.

Lowering barriers to communication allows us to connect with one another.



03

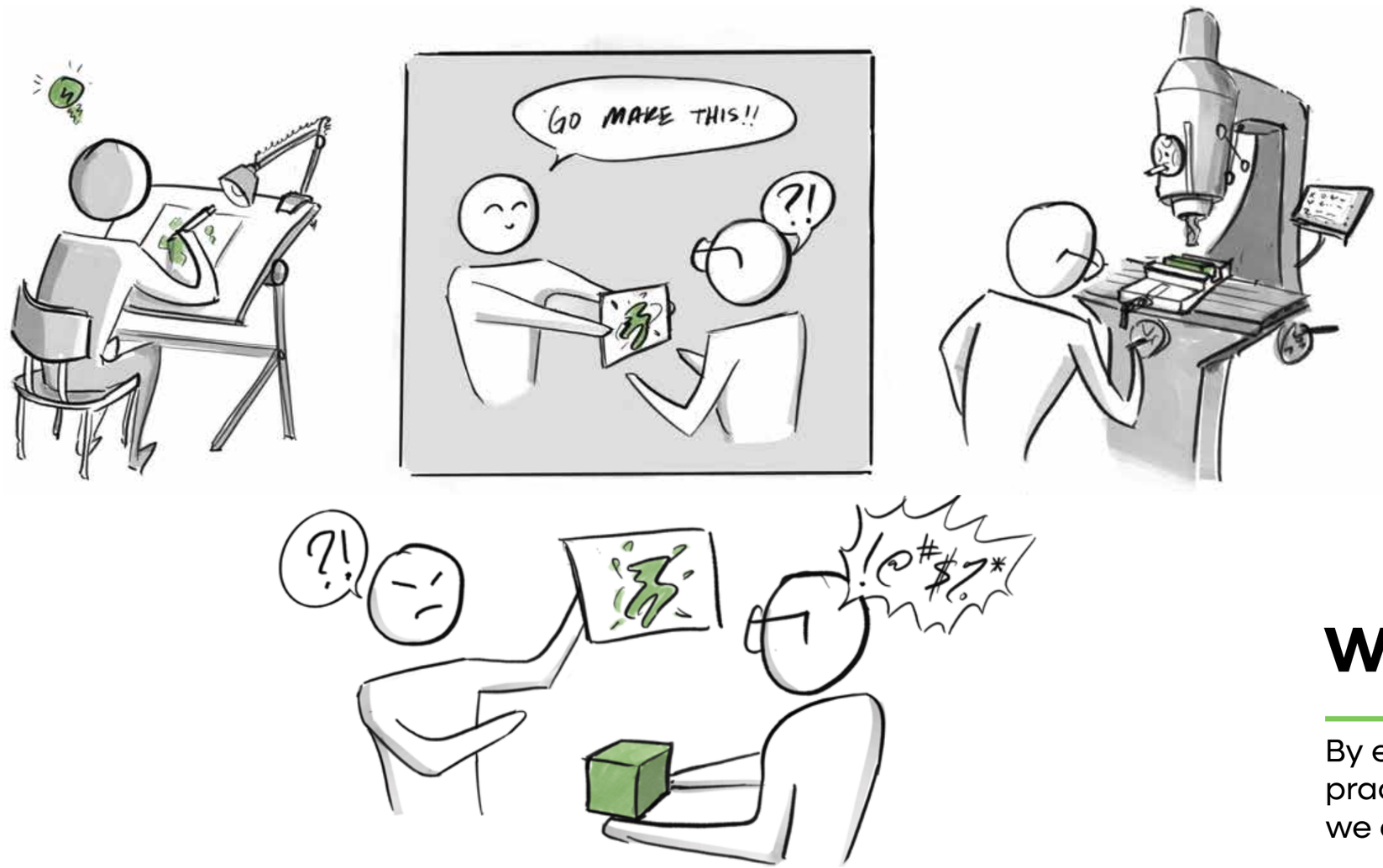
The Farm

A Student-Run Collective Education Resource

University Grant Project | 18 Months
2023

The “Hand Off” Problem

A common pitfall in design workflows is detachment from fabrication processes that occur after the “hand off” to the engineers.



We can fix this!

By exposing designers to the practical aspects of fabrication, we can avoid this dissonance.

This workflow doesn't educate.

The previous workflow for design students to fabricate their projects failed to facilitate learning.

Prompt
Receive a prompt for the project.

→

Design
Develop a CAD model that satisfies the prompt.

→

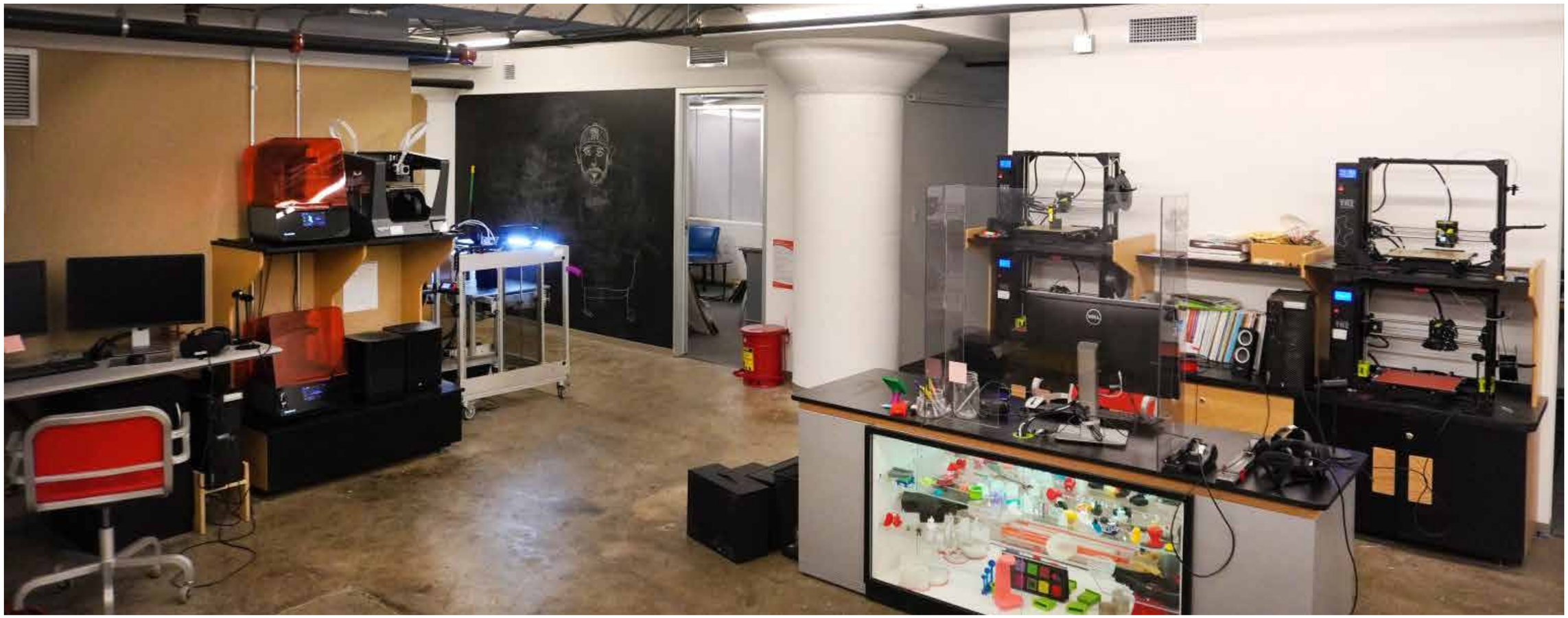
Submit
Send the model to the shop to be printed.

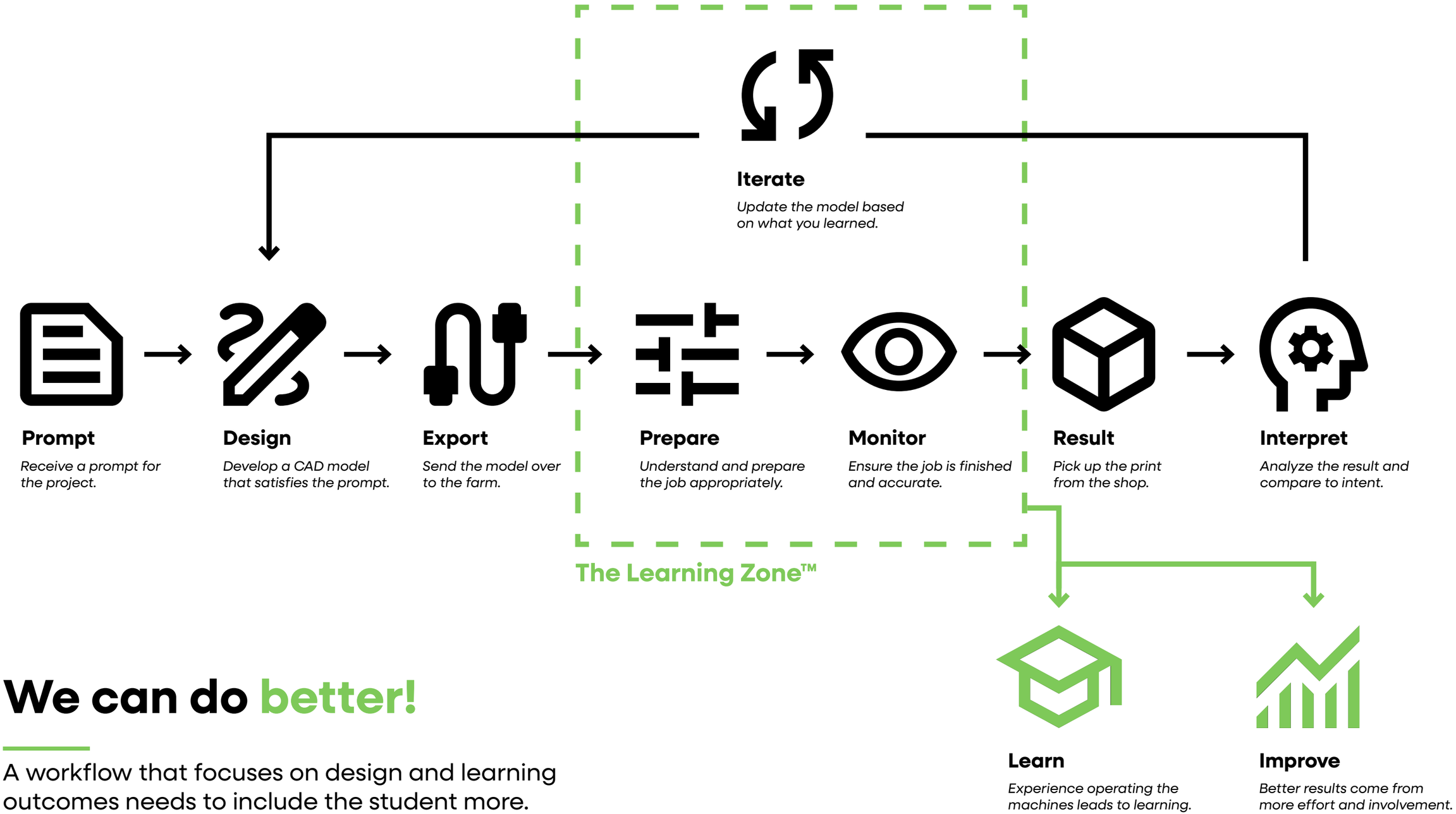
→

Wait
Wait a few days.

→

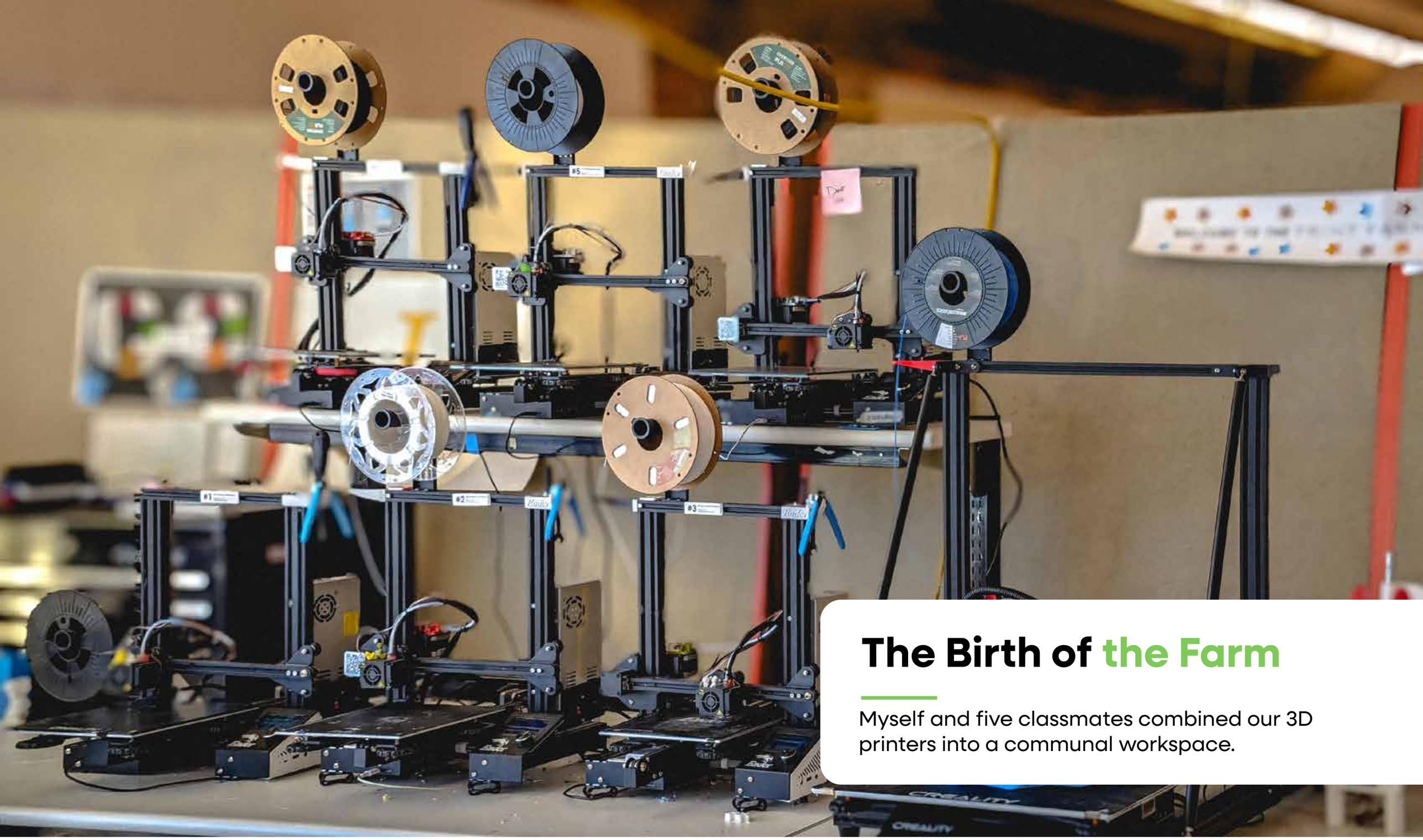
Result
Pick up the print from the shop.





We can do better!

A workflow that focuses on design and learning outcomes needs to include the student more.

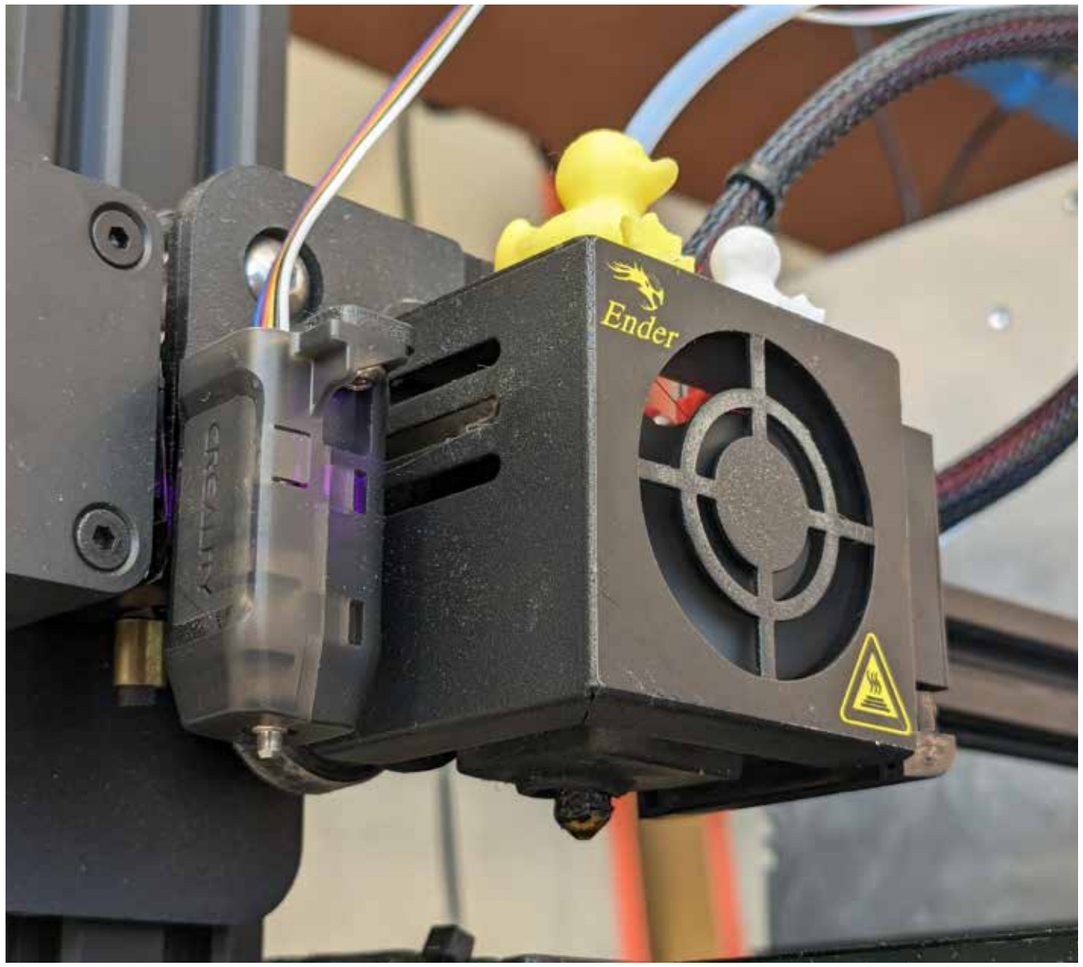


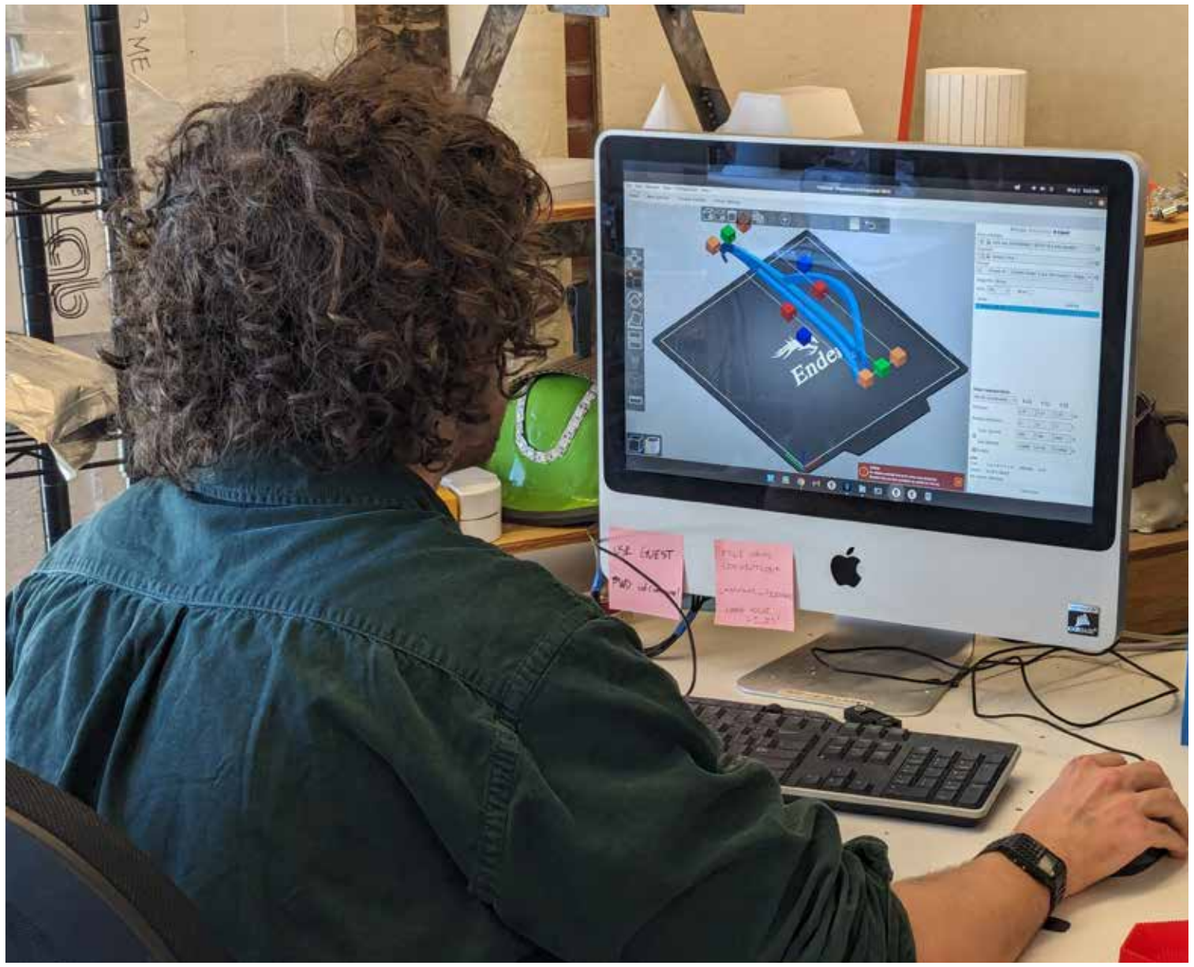
The Birth of the Farm

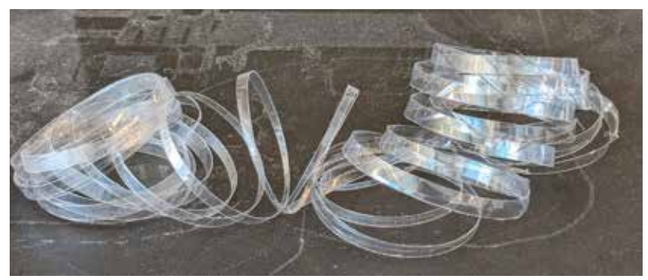
Myself and five classmates combined our 3D printers into a communal workspace.

Building an Intuitive Interface

Using an iMac from 2011, Klipper firmware, PrusaSlicer, and some hardware upgrades, I was able to make a beginner-friendly system.







Recycling and Managing Waste

Iteration makes a lot of waste. With 3D printing, we can keep the excess for recycling.
We also experimented with an open-source project called Polyformer for recycling bottles.

A Culture of Learning

Working with over 20 students, shared my knowledge and built a community around collaboration.

Expanding Project Opportunities

Having a resource like this in the studio vastly expanded what we were able to accomplish in our design work as students.

What did the Farm Accomplish?

In the short time that the Farm was active, between student projects and curriculum integrations, we printed a lot of projects.

10.6 km or 32 kg

filament printed

3600 hours

of total print time

1300 jobs

in total printed

*in the 3 semesters between Spring 2023 and Spring 2024

04

Equilibria

Electromechanical Kinetic Sculpture

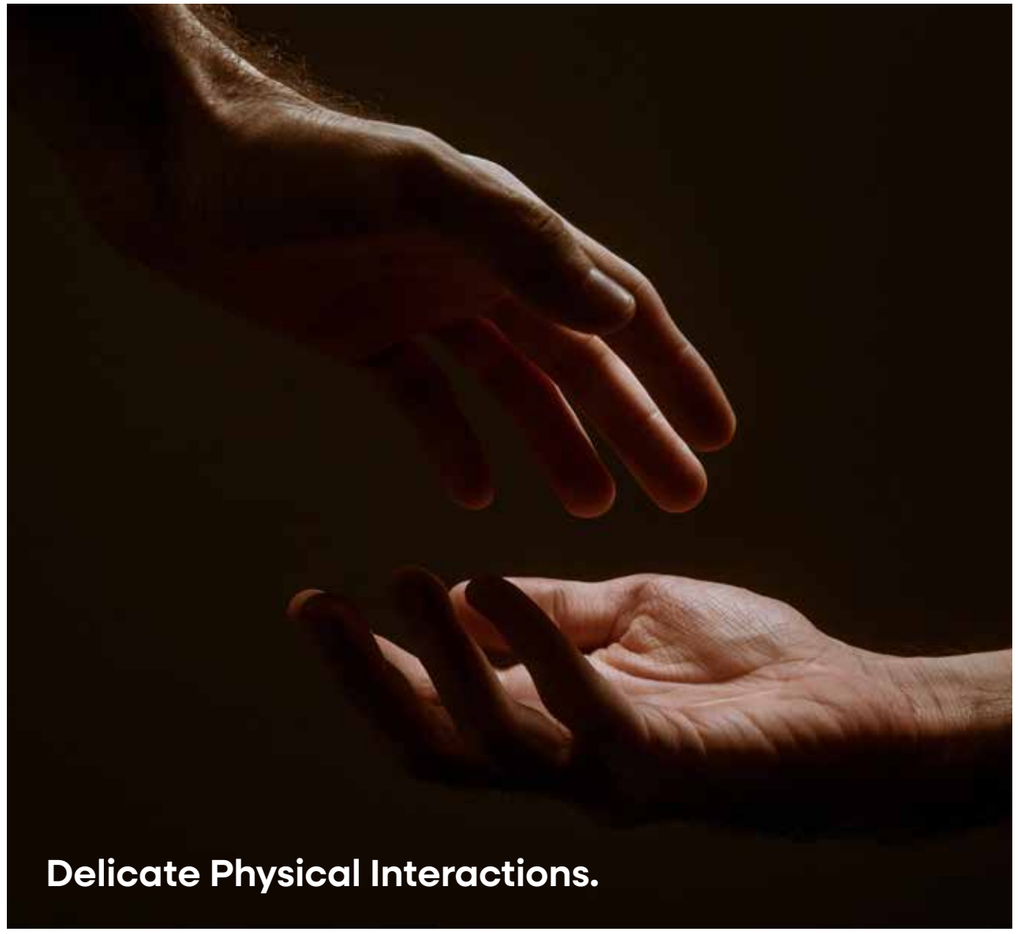
University Project | 2 Months
2023

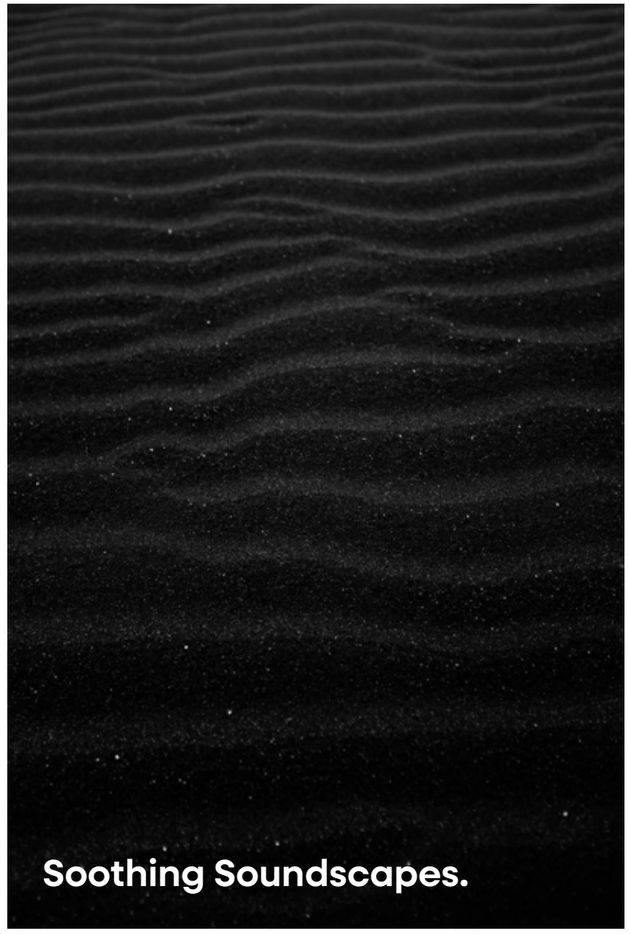
The Impact of Sound

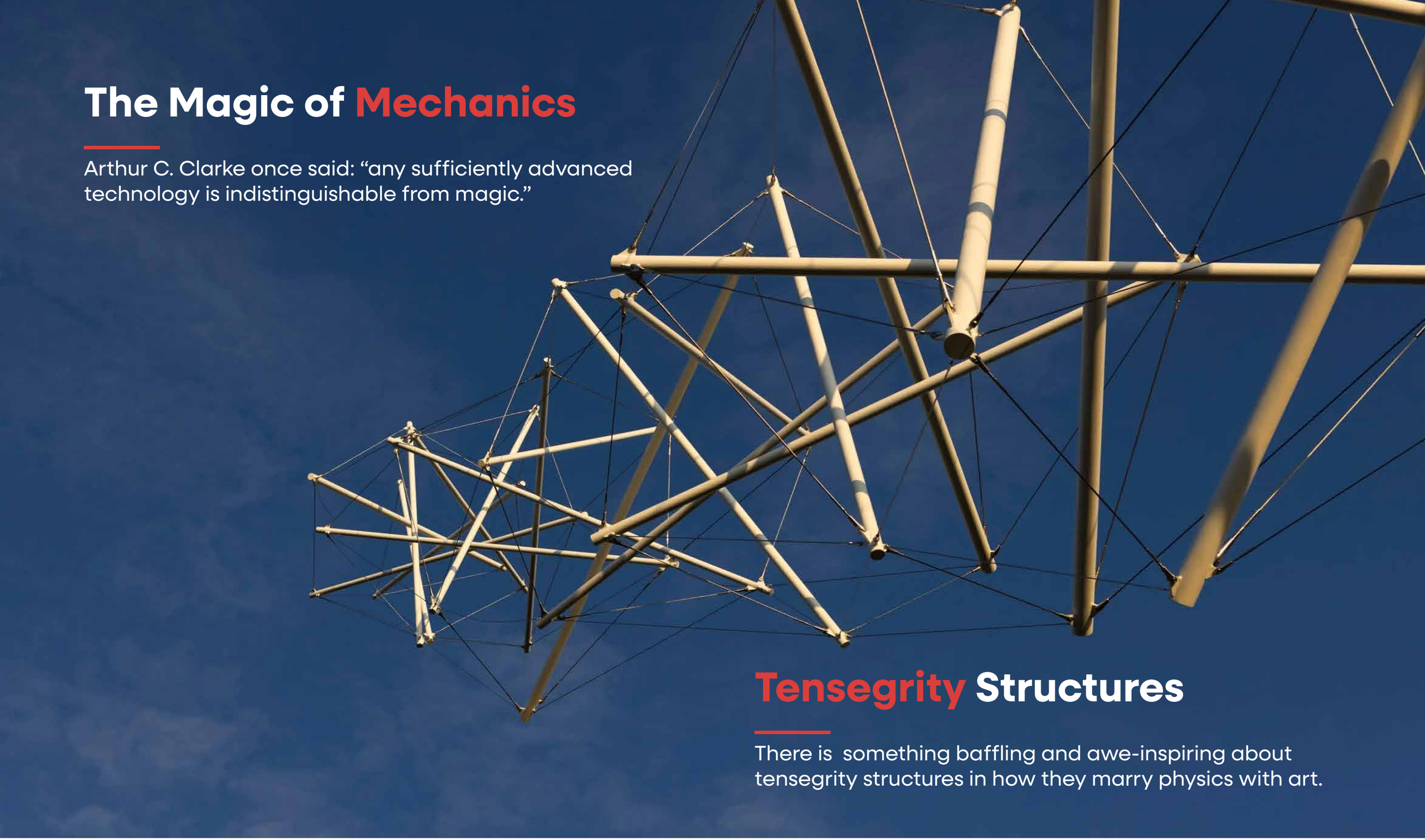
In our lives, sounds have a profound impact on how we think, feel, and behave. In designing products, it is crucial for us to fine tune the noises they make and consider the impacts we intend them to have.

Designing Pleasurable Artifacts

As designers, we are responsible for the emotional relationships that our users develop with our work. This must be considered deliberately.







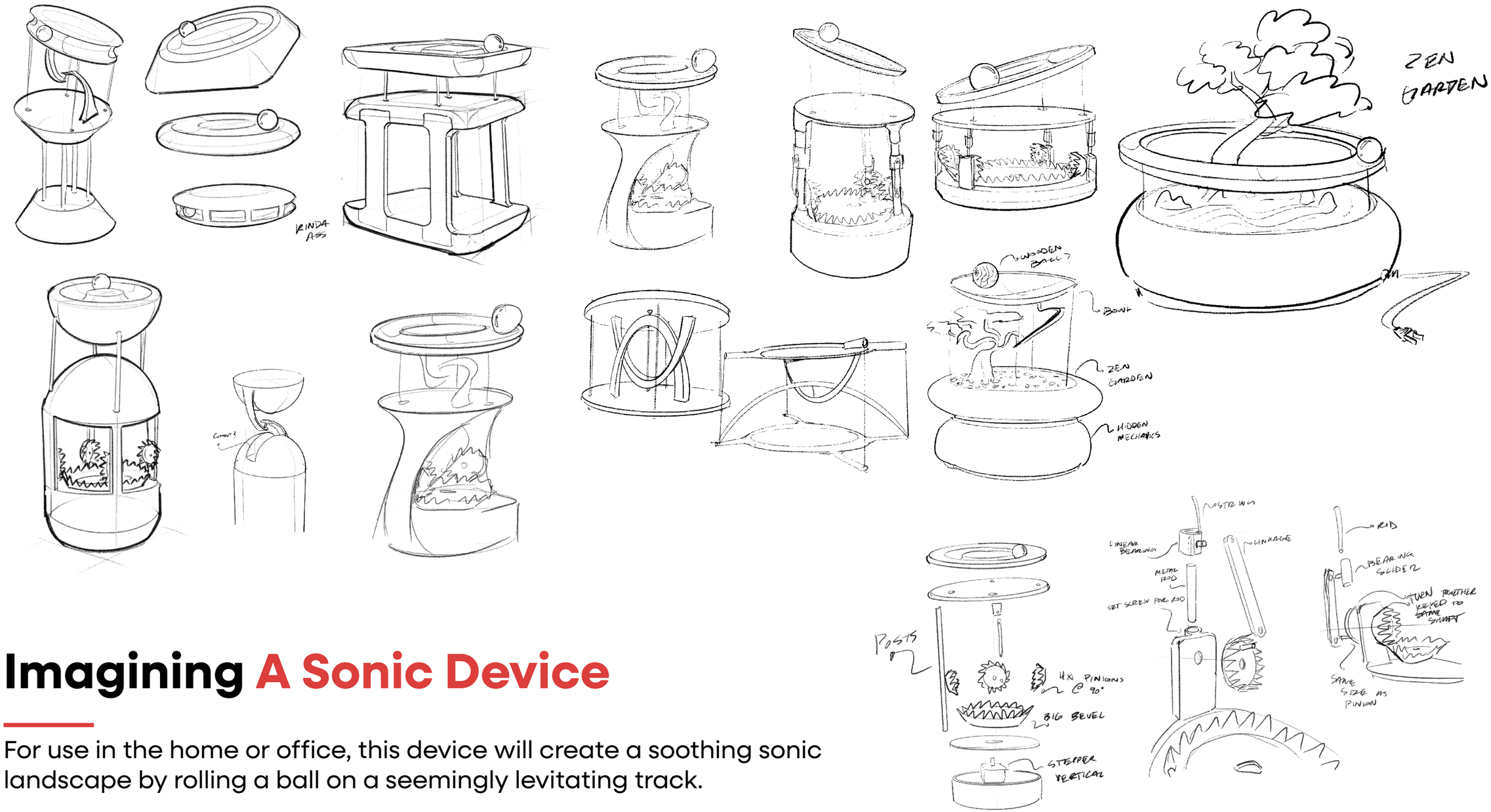
The Magic of Mechanics

Arthur C. Clarke once said: “any sufficiently advanced technology is indistinguishable from magic.”

Tensegrity Structures

There is something baffling and awe-inspiring about tensegrity structures in how they marry physics with art.

Pictured: Unit9’s “Lotus Aeroad”



Imagining A Sonic Device

For use in the home or office, this device will create a soothing sonic landscape by rolling a ball on a seemingly levitating track.

Developing the Concept

This device must be natural and calming in its materials and should exude wonder and mysticism in its function.

Modeled in SolidWorks, Rendered with Blender

Bringing it to Life

Developing and 3D printing a range of functional prototypes to refine the concept toward completion.

Prototypes Modeled in SolidWorks and 3D Printed

Realizing Equilibria

After multiple rounds of iteration and prototyping, a final realization of the kinetic sculpture emerged.

See Equilibira in motion:

Video Link: https://youtu.be/sCxIp4ywR1k

Thanks!

Please feel free to reach out with any questions or feedback!

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Albany, NY