

2023

Product Prototyping Design **Portfolio**



Albert S. Hodo

A l b e r t **S** e n y o **H** o d o



Albert Senyo Hodo

Interface Design Engineer

I love designing new technologies and prototyping them. My background in Computer Science and IoT influences how I approach every design challenge. I like to think of how design impacts the world by adhering to the UN's agenda 2050 Sustainable Development Goals [SDGs]

Berkeley, California, USA

Basketball | Swimming | Roadtrips | Amapiano



Albert J. Hodo

About me

Education

2023 - MEng Design [Emerging Technologies]
University of California, Berkeley

2021 - BSc Computer Science
Ashesi University, Ghana

Work experiences

2022 - Product Designer [Software]
MasterCard Foundation, Remote

2020 - 3D Game Developer
KnackApp Corp. San Francisco

Competences

Personal skills

Attention to detail
Time management
Problem solving
Leadership

Design skills

Scenario Analysis
User Research
2D & 3D Rapid Prototyping
Concept Ideation

Contacts

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Other experiences

2021 - Google UI/UX Design Certificate
Coursera

2019 - Facebook Engineering Mentee
Meta ,Remote

Software skills

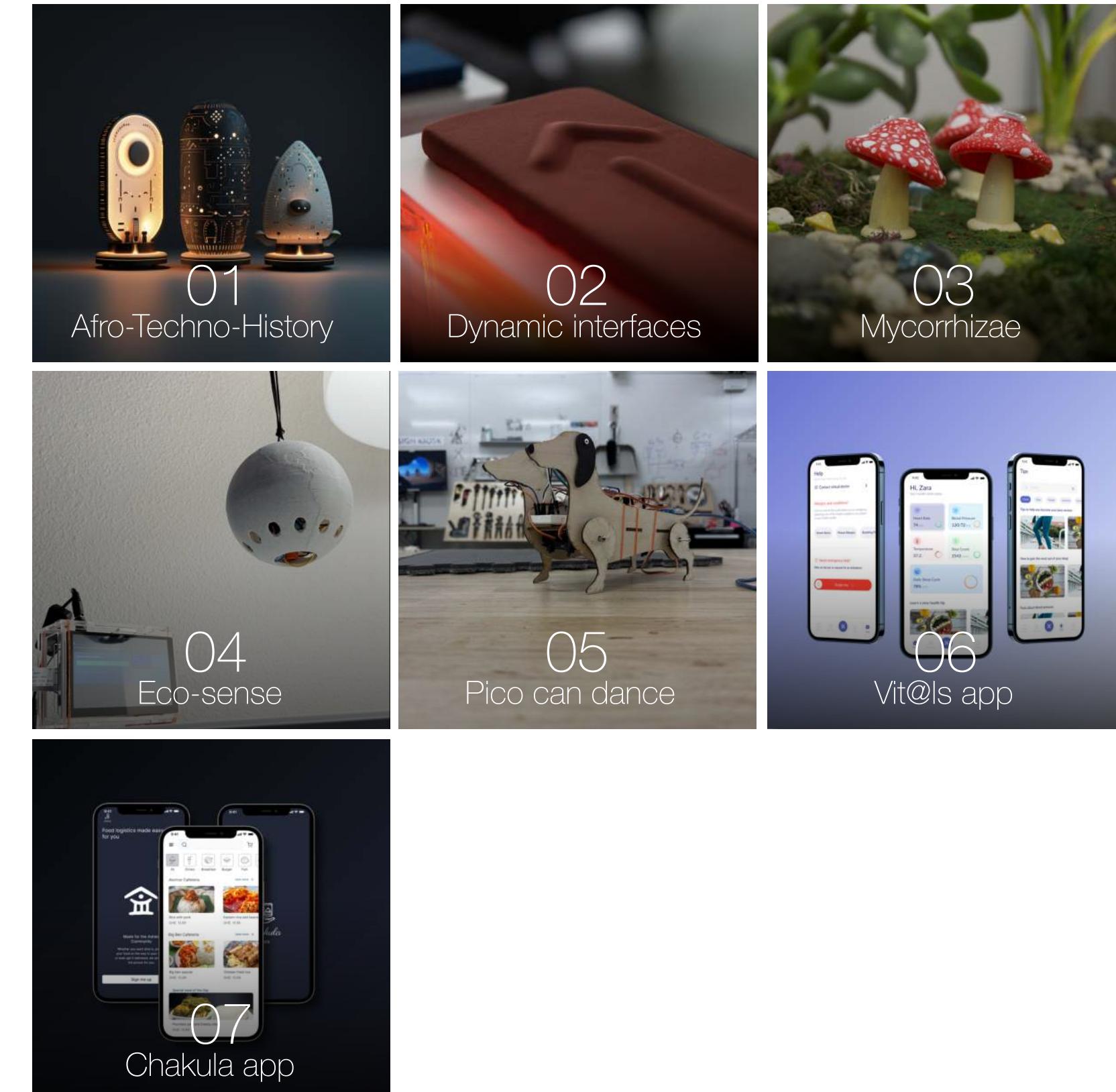
Fusion 360 Unity 3D
Blender
Figma
Adobe suite

Programming

ReactJS
Python
C# / C++
HTML / CSS / JS

A glimpse into my work!

"I am **not** a traditional generalist
I happen to specialize in a variety
of domains"



01 Afro-Techno-History

Abstract

Technology design frameworks and practices around the world embody one school of thought and this is not ideal. Different communities have not had their ideologies and practices influence the kinds of design and technologies they use especially in African colonized and marginalized countries. This is mainly because such frameworks were adopted by the "colonizers" and there is no organic link between the technologies used, cultural ideologies and the developmental state of such countries. This thesis explores a new paradigm or framework for designing technologies in which devices are designed contextually, with local cultural ideologies. These themes are explored with the Ghanaian community as a case study where three smart home devices are designed to express the cultural heritage through form, shape and physical interaction.

Each device is designed with cultural heritage and lives in a distinct context of the home; the living room, bedroom and hallway and has its practical function.



Masters Thesis

02 Dynamic Interfaces

This project explores inflatable interfaces and speculates what smart IoT interfaces could be at the home and public spaces. A series of 3 basic interfaces were prototyped and presented at the Berkeley Jacobs Institute '22 exhibition.

Type Class Project [3 months]

Team John Brechbill, Albert Hodo [2 people]

Role Electronics prototyping, silicon molding,
product research



Brief

Feral design based on nature

What does perseverance and resilience in the environment mean and how can that influence design in a larger sphere causing us to change our current human designs.

Perseverance is defined as the continued effort to do or achieve something despite difficulties, failure, or opposition

Resilience is defined as the capacity to withstand or to recover quickly from difficulties; toughness. Also, the ability of a substance or object to spring back into shape; elasticity.

Beyond-Human-Centered-Design must be based on nature. Design should develop **sustainable devices** that are **accessible** and **intuitive** to all.



Contextual Analysis

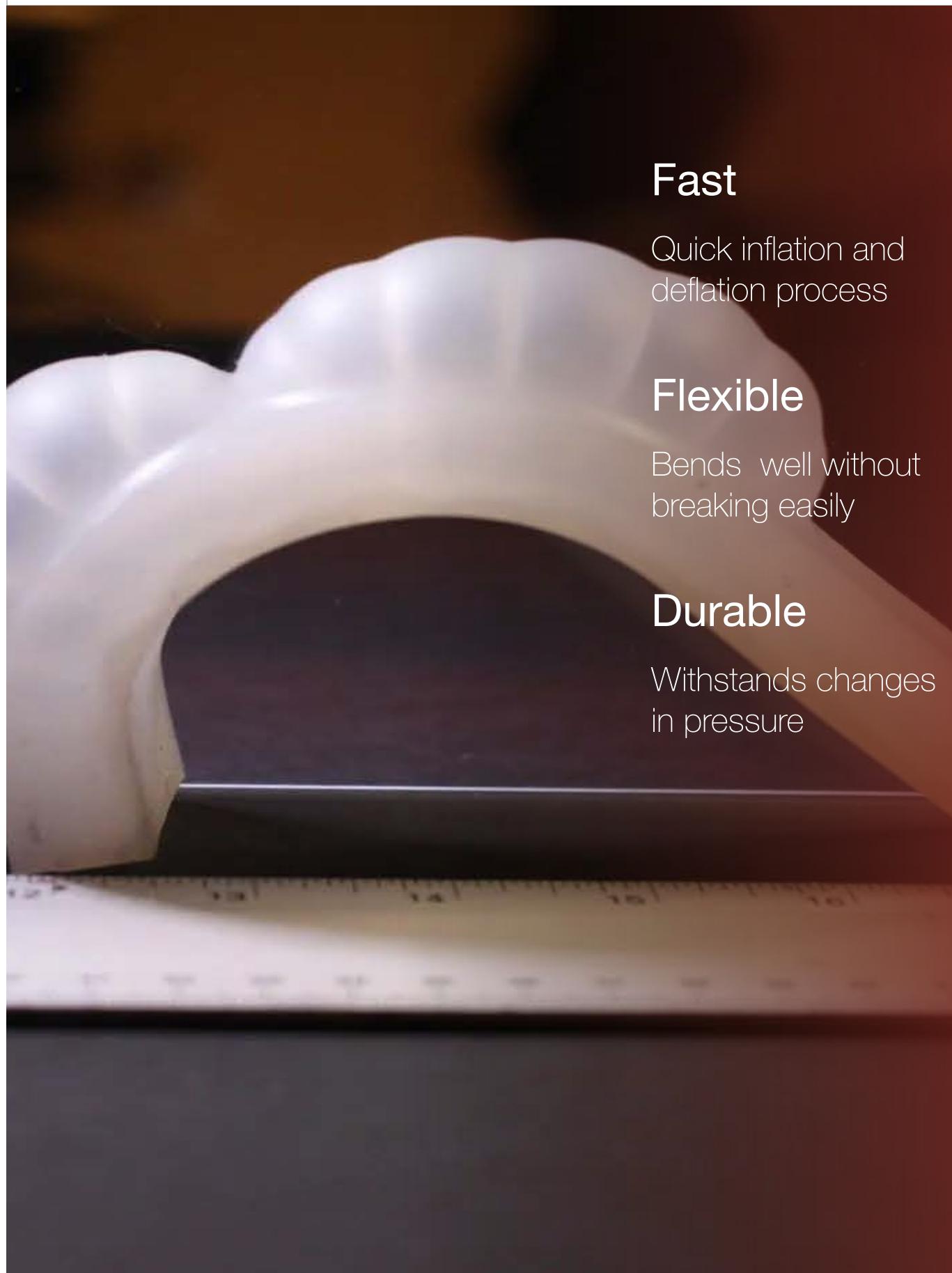
Camouflage: to hide in plain site

Nature possesses an extraordinary ability to camouflage and hide creatures in plain sight, demonstrating the marvels of adaptation. Countless species have evolved to blend seamlessly into their environments, using colors, patterns, and textures to elude predators or stalk their prey. For instance, chameleons expertly match the hues of leaves and branches, while stick insects mimic twigs, becoming virtually indistinguishable. This remarkable phenomenon showcases the power of evolution, highlighting nature's ingenious strategies for survival.

How can devices use camouflage to simplify user interactions?



Technology



Silicon and soft robotics

Soft robotic silicon is a highly flexible and adaptable material known for its ability to undergo deformation and inflation. It can change shape and stretch in response to external forces, allowing it to navigate through complex and confined spaces with ease. By controlling the inflation of specific chambers within the silicone structure, these robots can perform tasks such as gripping objects, crawling, or even swimming.

The silicon allows us to precisely control the **size** and **shape** needed with pneumatics within **seconds**. This can be controlled by basic **IoT** electronics as well.



Concept

An experiment of concept **home devices** with **dynamic interactive** features such as buttons for ease of use.

Tactile

Able to provide normal tactile feedback

Calm

Ambient and calm by nature

Camouflage

Able to hide in plain site

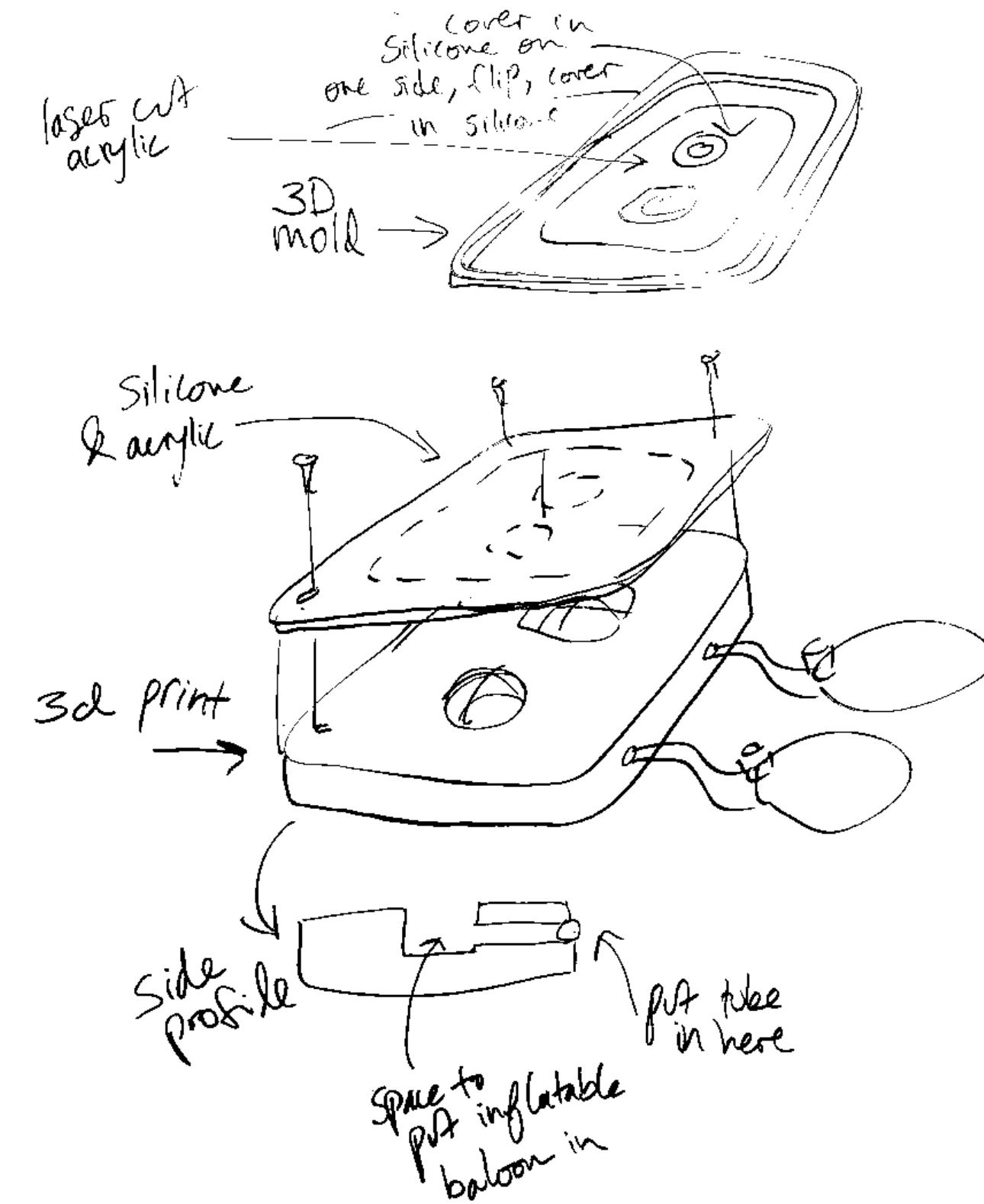


Core Design

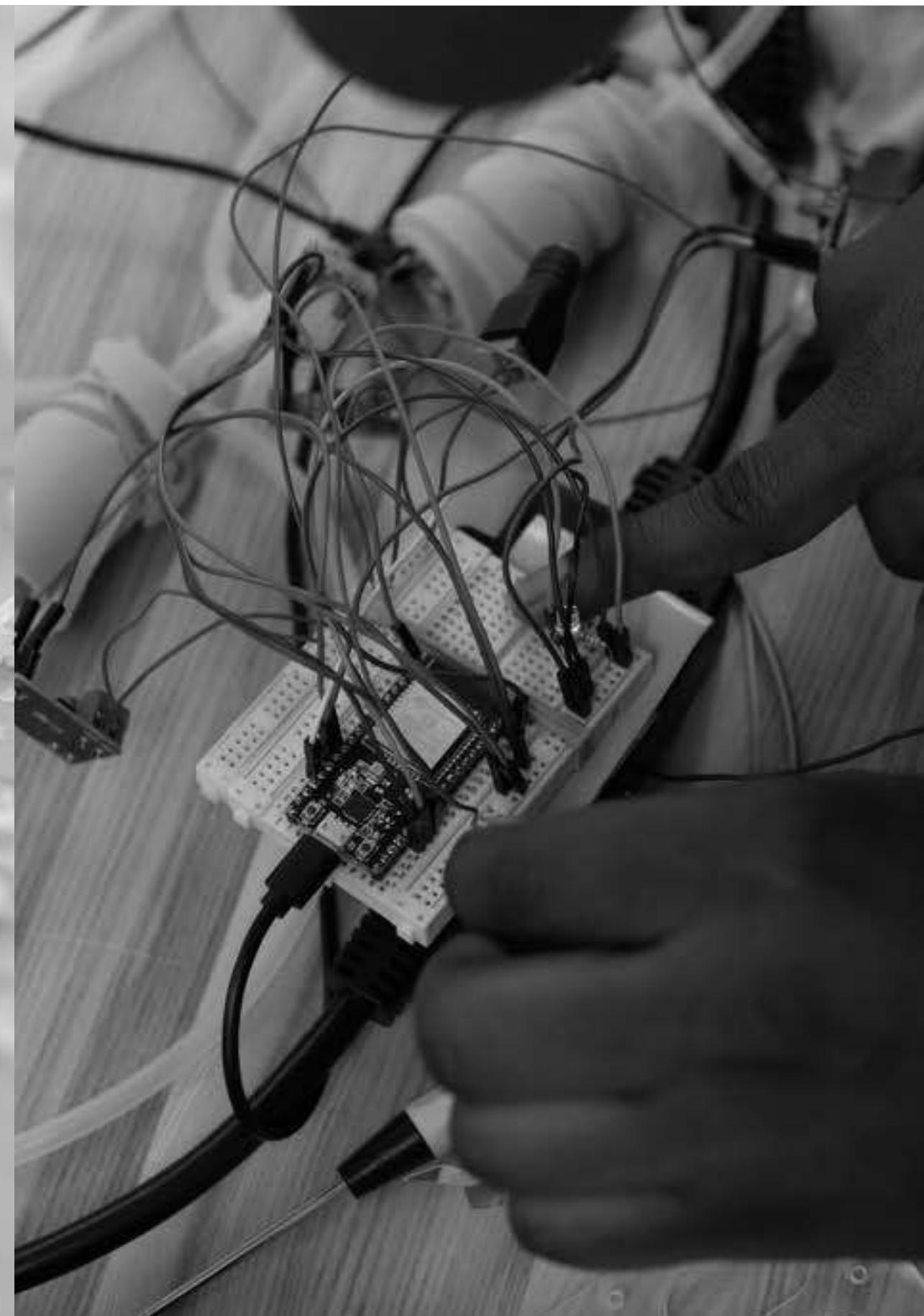
Pneumatic mechanism

The main mechanism is air pushed through a rubber tubing into a silicon bladder via an air pump. The shape of the inflated bladder can be controlled by the casting of the silicon as well as using a frame to limit the space the bladder can take.

A pressure sensor is also added to the rubber tubing to detect a push in the bladder signifying input from a user.



Development



• • • •

Watch [lo-fi user testing!](#)



product design
prototyping
ui / ux

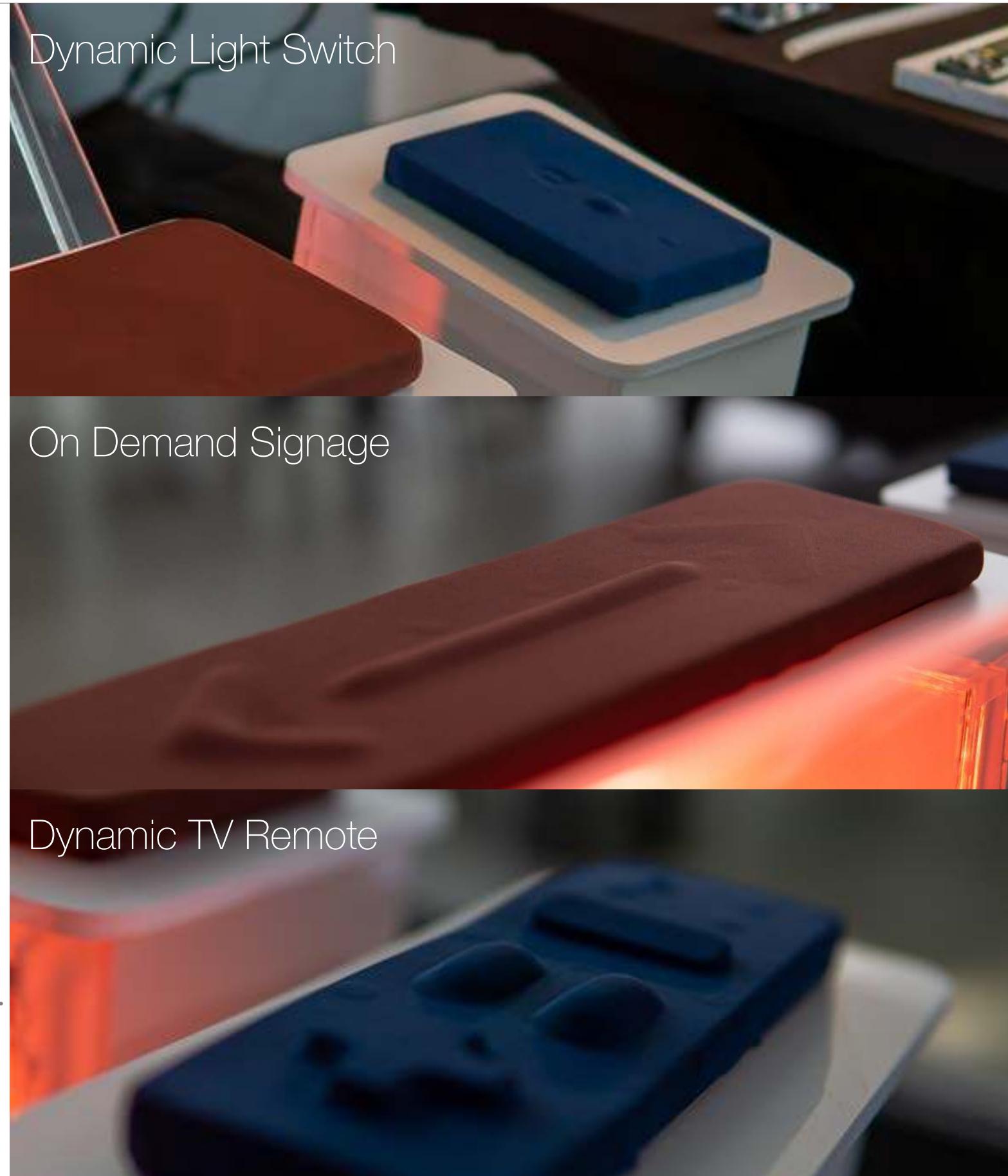


A new approach

Hide all distractions

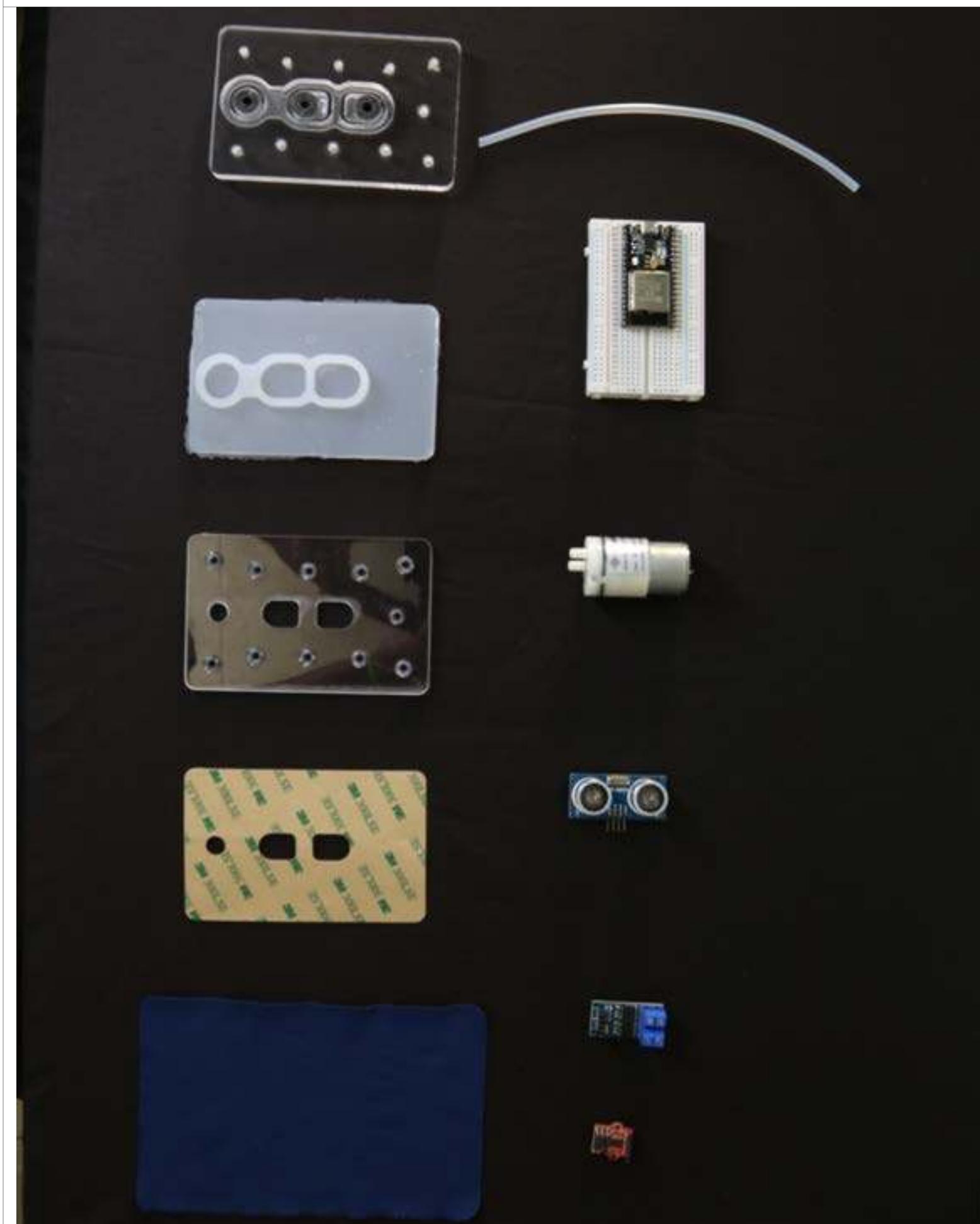
Imagine hiding all unnecessary buttons on your tv remote with a voice command or a push of a button. Using software programming and silicon to change our physical environments is an attempt to tackle the rigidity and limitations of physical spaces through sustainable materials. It is a step closer to blurring the lines between the digital and physical.

An experimental concept of smart interactive
dynamic home interfaces.





Components



Main Components

Silicon

The main dynamic component.

Adhesive & Fabric

To look and feel familiar but unique.

Acrylic Frame

Was used to provide structure.

Electronics

pumps, pressure sensors, Esp 32 and ultrasonic sensors were used.

Designed and prototyped with **modularity** to be **efficient** during **manufacturing**, **repair** and **assembly**.



Hide the noise in plain sight.
Say goodbye to complex interface
modules.

Exhibition video!



02 Mycorrhizae

Mycorrhizae is an interactive exhibit highlighting the hidden communication between plants, mushrooms and the underground forest ecosystem, known as the Mycorrhizal network. The installation was exhibited at the Berkeley Jacobs Institute '22 winter exhibition.

Type Class Project [3 months]

Team Justin Trainor, Helena Kent,
Neel Shay, Gracy Kureel, Albert Hodo [5
people]

Role Projection mapping, Computer vision, Physical
computing and fabrication



Brief

Personification through design

Most people see nature as a resource meant to serve us and do not necessarily consider **us being part of nature**. People also don't perceive nature as **conscious living things** and do not really grasp the gravity of how we destroy and pollute nature in many ways.
The impact of our design choices can be seen in **micro-plastic waste** to **environmental pollution** to **climate change**

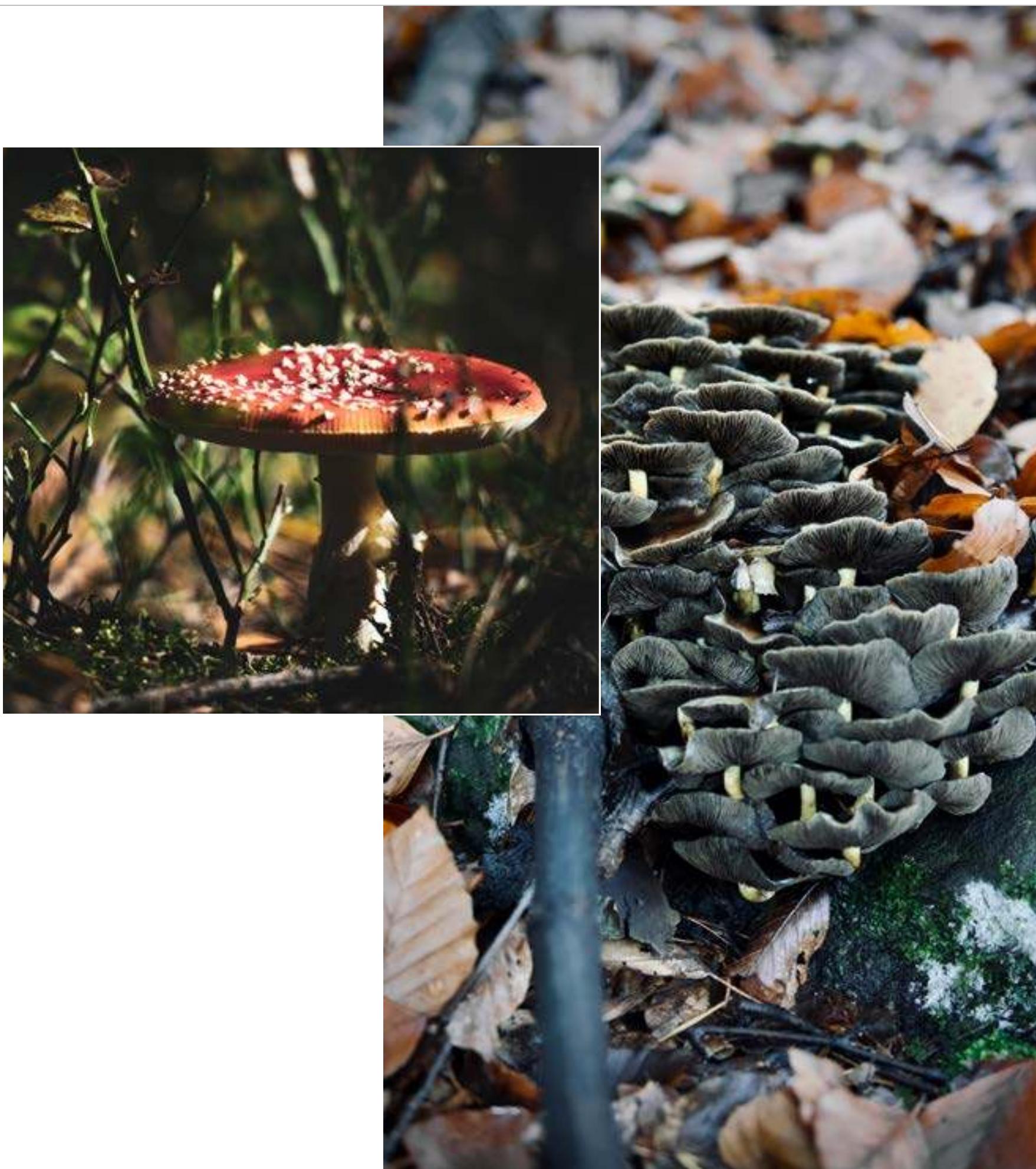
Design must be inspired by the experiences of nature; for **nature** was **alive** before us and **we** are a part of nature.



Contextual Analysis

Mycelium: nature's consciousness

Inspired by Netflix's Fantastic Fungi series. Mycelium has collective consciousness and provides a well hidden communication between plants, mushrooms and the underground forest ecosystem, known as the Mycorrhizal network. It has many properties but one fascinating thing is that it works similarly to the WWW and internet as we know.



How might we create **stronger connections**
between **humans** and **nature**



Concept



An interactive installation on the intelligent symbiotic relationship between plants and mycelium

People move the mushrooms about to create a link of communication between the plants and this is enhanced by computer vision, projection mapping and mushroom synthesized sounds.

Design

Play area design

Plants

Two plants in opposite sides

Moveable mushrooms

Interactive mushrooms to create a pathway for the plants

Animations

To visualize the communication process of plants through mycelium



CAD model by Neel Shah



Development

Fabrication





Design



Main Components

Object tracking

To follow mushrooms in real time

Play area

Moss, rocks and leaves to represent nature

Projection mapping

to show live communication channels between plants

Sound feedback

pumps, pressure sensors, Esp 32 and ultrasonic sensors were used.

Designed with a combination of **natural** and **artificial** artifacts to symbolize a **symbiotic** relationship.



04 Eco-sense

Home-eco is a quick prototype of a smart home air and light monitoring system. It was made for spaces with accessibility needs for the blind as well as the hard of hearing.

Type Class Project [2 weeks]

Team Albert Hodo [1 person]

Role IoT system engineering, hi-fi physical prototyping and fabrication



Brief

Design for accessibility

I reached out to an accessibility hardware shop on the UC Berkeley campus to find out what current problems they needed help exploring. The lab had no way of monitoring the air quality and light flickering for people especially for those that were more susceptible to seizures. They needed some system that monitored it and also notified people regardless of whether they were deaf or blind and alone in the space.

Design an IoT system that monitors, air quality and flickering lights (3-60 Hz/s) in a home shared by deaf and blind people.

Designing for differently abled people produces new paradigms that benefits all; especially users that were not considered.

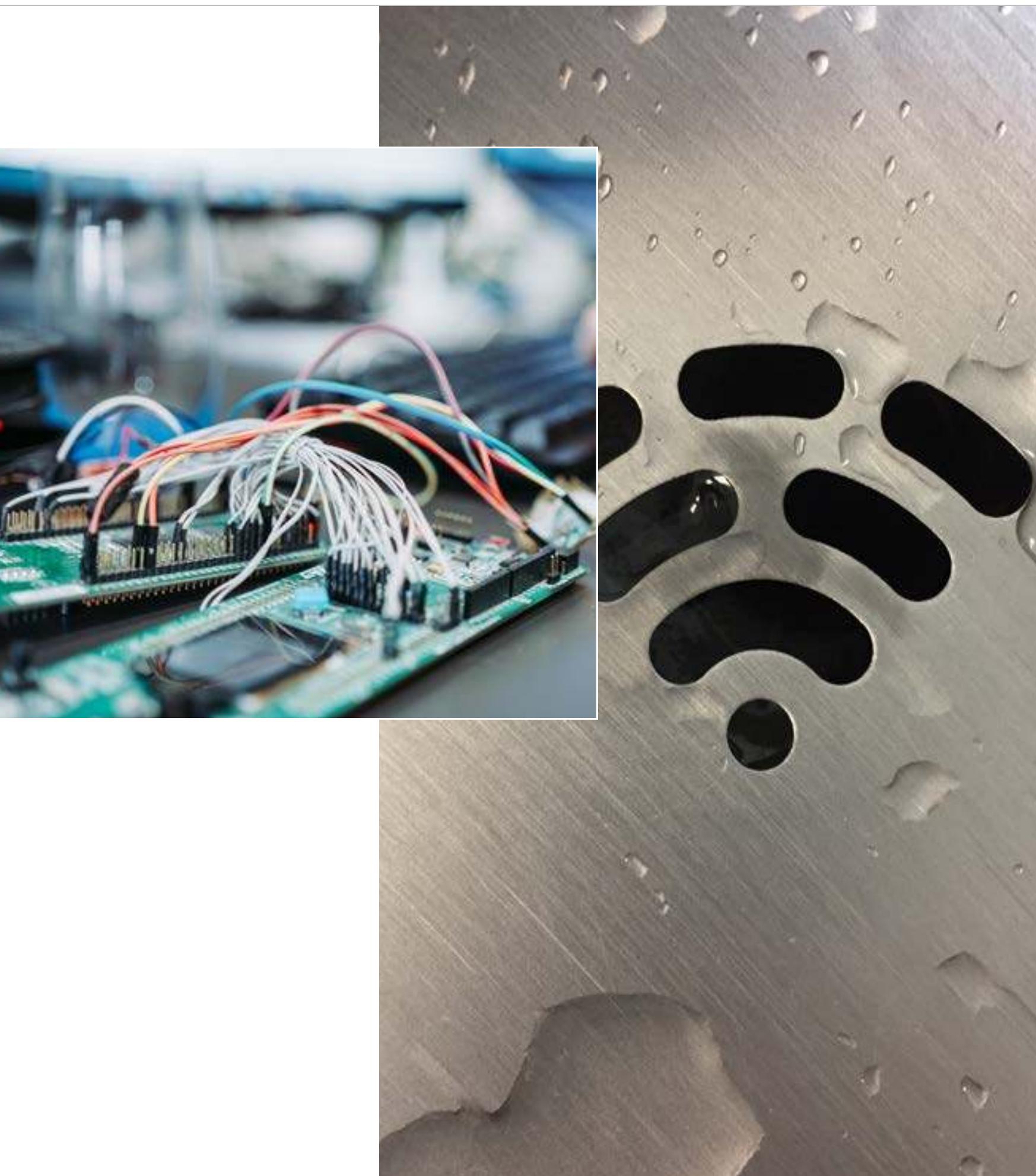


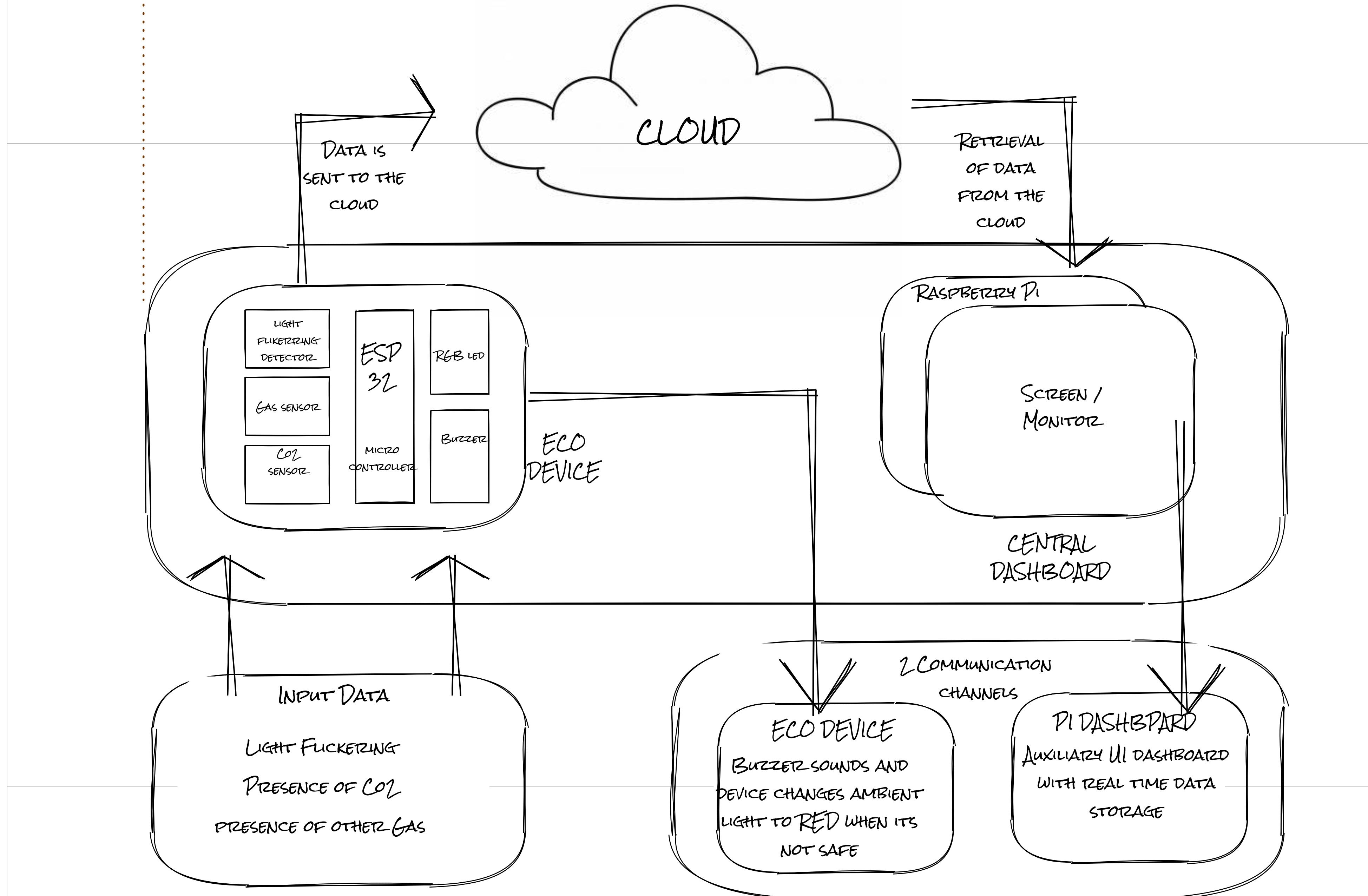
Concept & Technology

Smart Home IoT systems

IoT systems allow us to use sensor and actuator systems to retrieve data and affect the environment in ways we want via microcontrollers and networks such as WIFI and bluetooth. This provides the perfect opportunity to solve this problem and create something that blends with the space and doesn't look like a medical product.

Smart Home systems are **elegant** and able to monitor anything and has the ability to blend in with the **decor**.





**DEV
TOOLS:** ECO DEVICE : C++, Arduino, MQTT library

DASHBOARD: Javascript, React.js, Tailwind.css, MQTT library

A simple and clean dashboard to monitor the room quality at all times.

Rapid Hi-Fi Prototype of the system dashboard.



Leveraging an effective ambient notification system for both blind and hard of hearing individuals

Rapid Hi-Fi Prototype of the Smart Eco device.



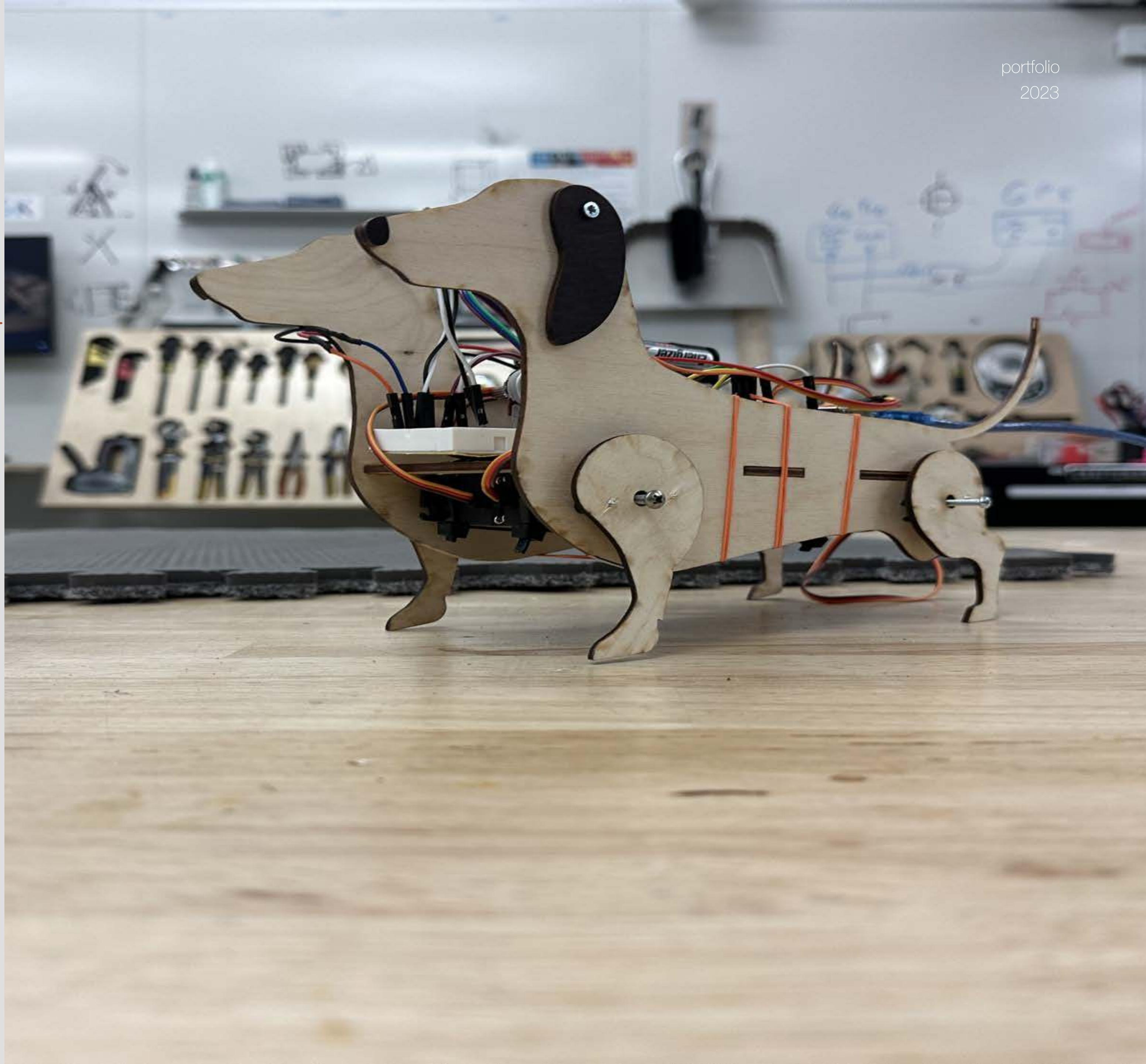
05 Pico can dance

Pico is a lovely 2D robot dog who enjoys dancing in the maker studio when he hears the sound of music.

Type Personal Project [[3 days](#)]

Team Haesung Park, Albert Hodo [[2 people](#)]

Role c++ programming, 2D prototyping and fabrication

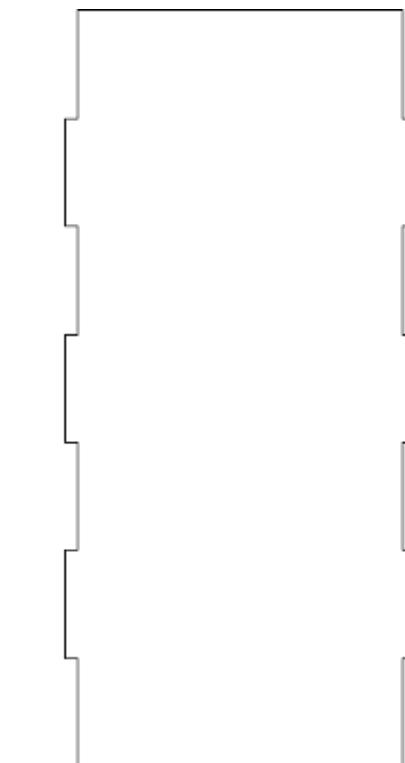
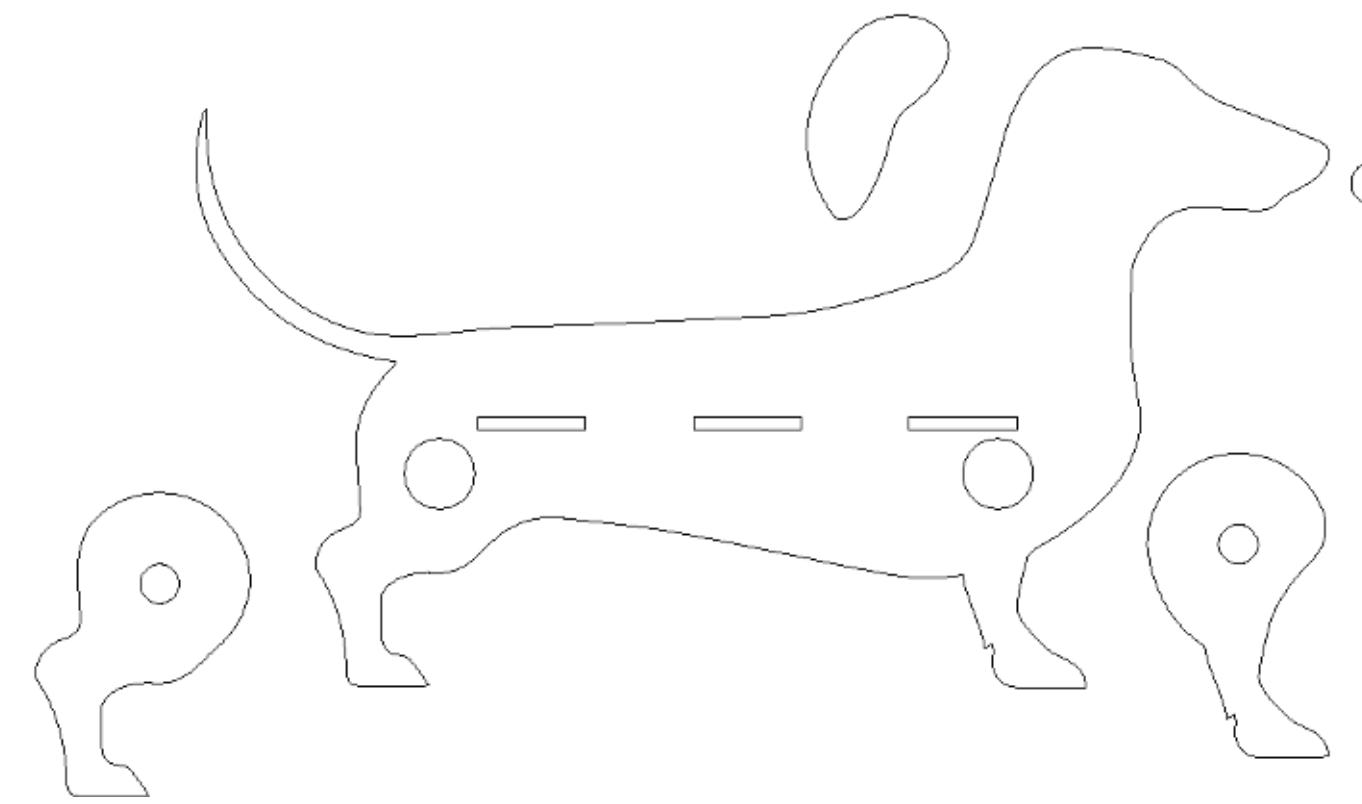
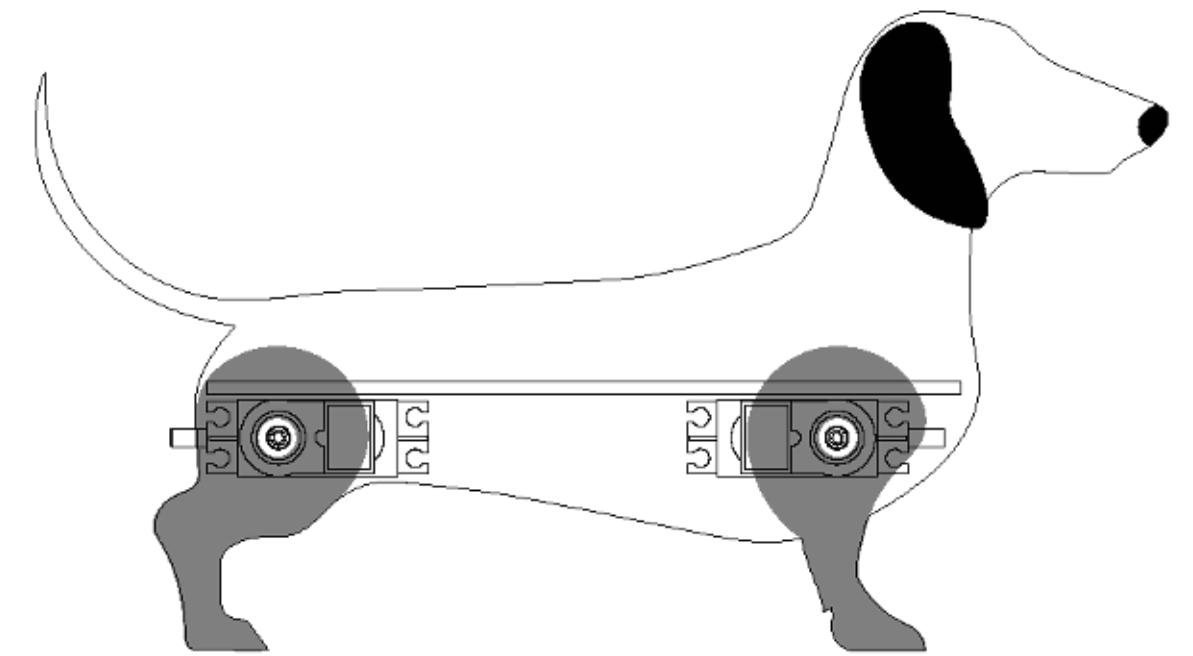


Brief

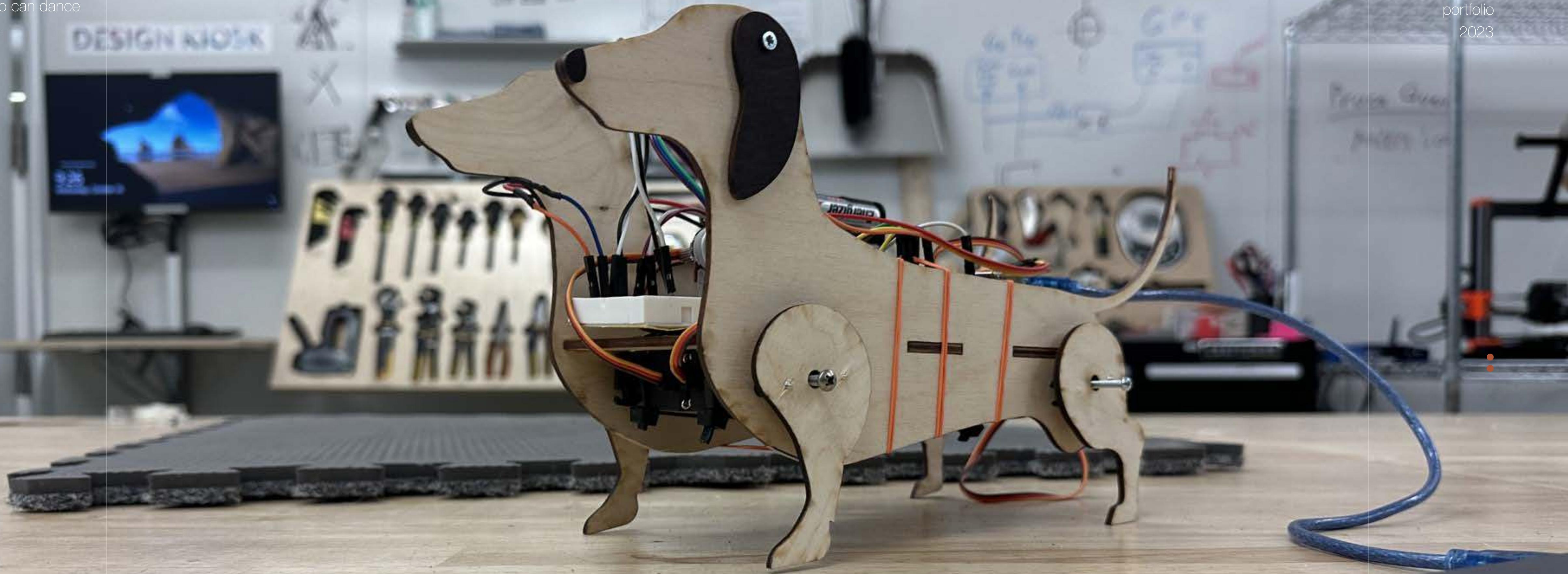
Pets and robots

The aim of this project was to create a 2D pet for the design maker space to cheer people up and keep them company. When moral is low due to tight deadlines, a mechanical pet might be all we need.

Good design sometimes needs to be **lo-fi** and rough in nature but with a dash of personality and charm.



Illustrator File by Haesung Park



Scan the QR code to view a
snippet of Pico's dance
moves

PICO 2 COMING SOON !

06 Vit@ls app

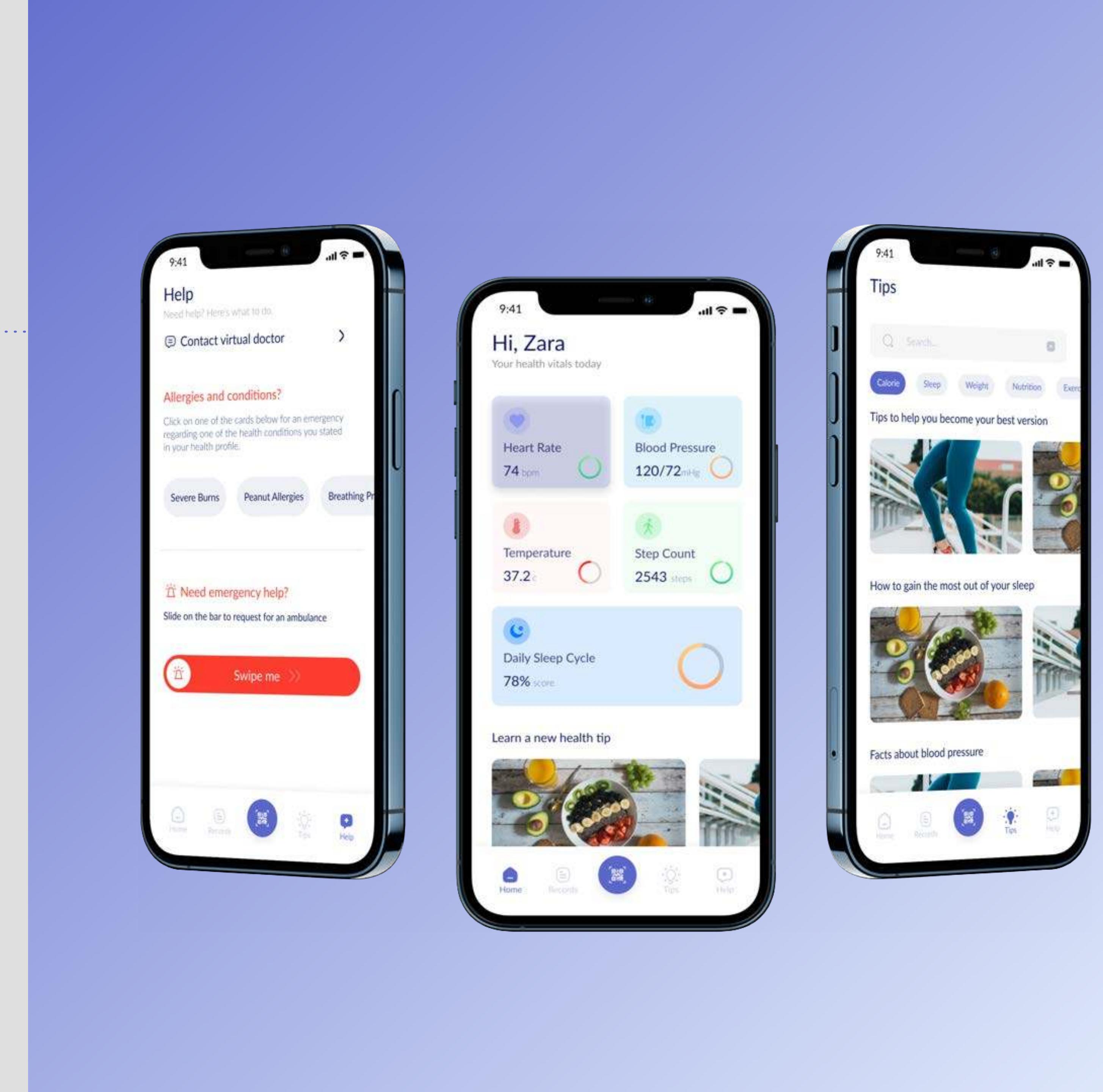
Vit@ls is a health application that provides users with a virtual central hub to connect all home medical devices to read and control from one place. It monitors your health and uses the data to provide personalized tips for a healthy lifestyle

Type Personal Project [3 months]

Team Joseph Shorla, Albert Hodo [2 people]

Role UX researcher, UI designer

More details upon request



07 Chakula app

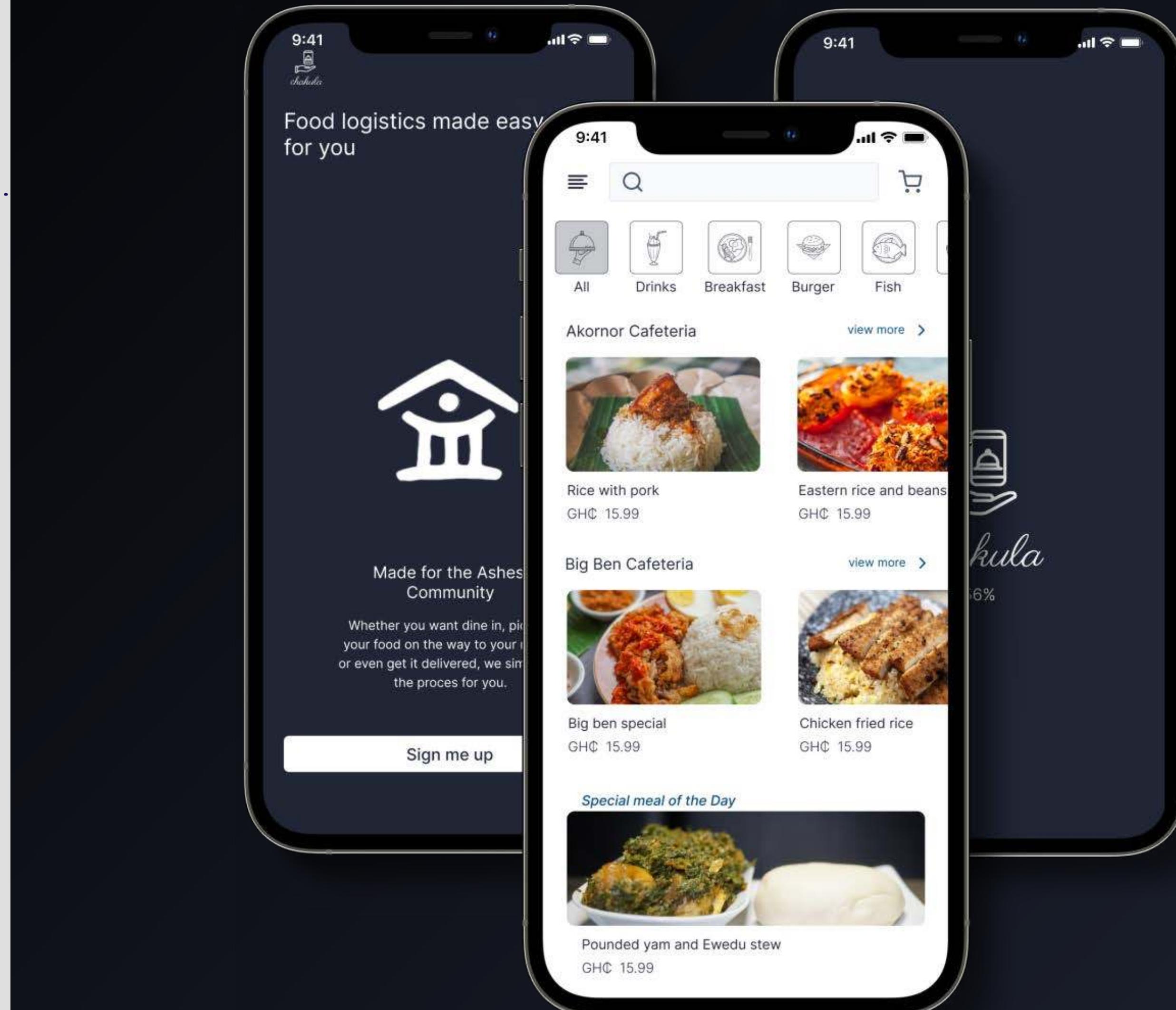
Chakula is an application designed specifically for the Ashesi university community, enabling individuals to conveniently place orders at any of the campus cafeterias. The primary goal behind its creation was to minimize the waiting time experienced by people at the different cafeterias.

Type Personal Project [3 months]

Team Albert Hodo [1 person]

Role UX researcher, UI designer

More details upon request



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