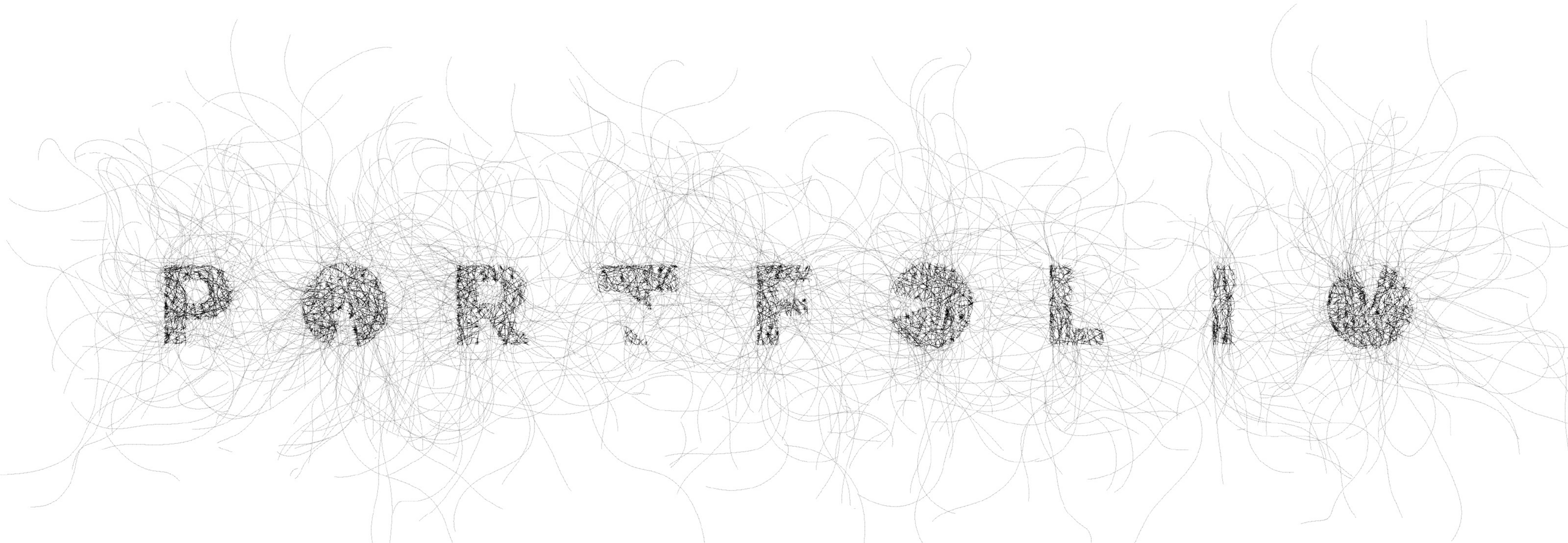

Nian Tong 2023 MDes

Nian Tong

User Experience Designer

Identify the right problems and craft optimal solutions.

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Berkely, California

Education

University of California, Berkeley — Expected **Dec 2023**
Master of Design, focused on Human-Computer Interaction | GPA 3.8

Shanghai Jiao Tong University — Jun 2022
Bachelor of Engineering, Industrial Design | GPA 3.7

Experience

IDEO | Experience Design Intern — Jun - Sept 2023

Renowned global design thinking and innovation company

- Led **qualitative research** through user interviews and 5 focus groups, leveraging consumer insights to define the **new value proposition.**
- Conducted **usability tests** and user testing, while creating **sacrificial concepts** during the design sprint to refine design approach.
- Engaged in **strategic innovation** process, from wireframe to diverse, tailored solutions and storytelling. Curated **5 co-creation workshops** to present design directions and discuss with clients, ensuring success of their business goals.

Compiify | User Experience Design Intern — May - Aug 2023

Berkeley SkyDeck Startup focused on pay equity

- Shipped the **MVP design** of salary benchmarking features, streamlining decision-making for employers by providing intuitive real-time, filtered salary comparisons. Conducted generative user research and **competitive analysis** to enhance usability.
- Designed a unified rebranding of the **visual guideline**, website and corporate presentations, reinforcing brand consistency and appeal. Audited the components and styles across multiple product features, amplifying scalability for future growth.

OPPO | User Experience Researcher — June 2021 - Sept 2021

Global leader in consumer electronics industry

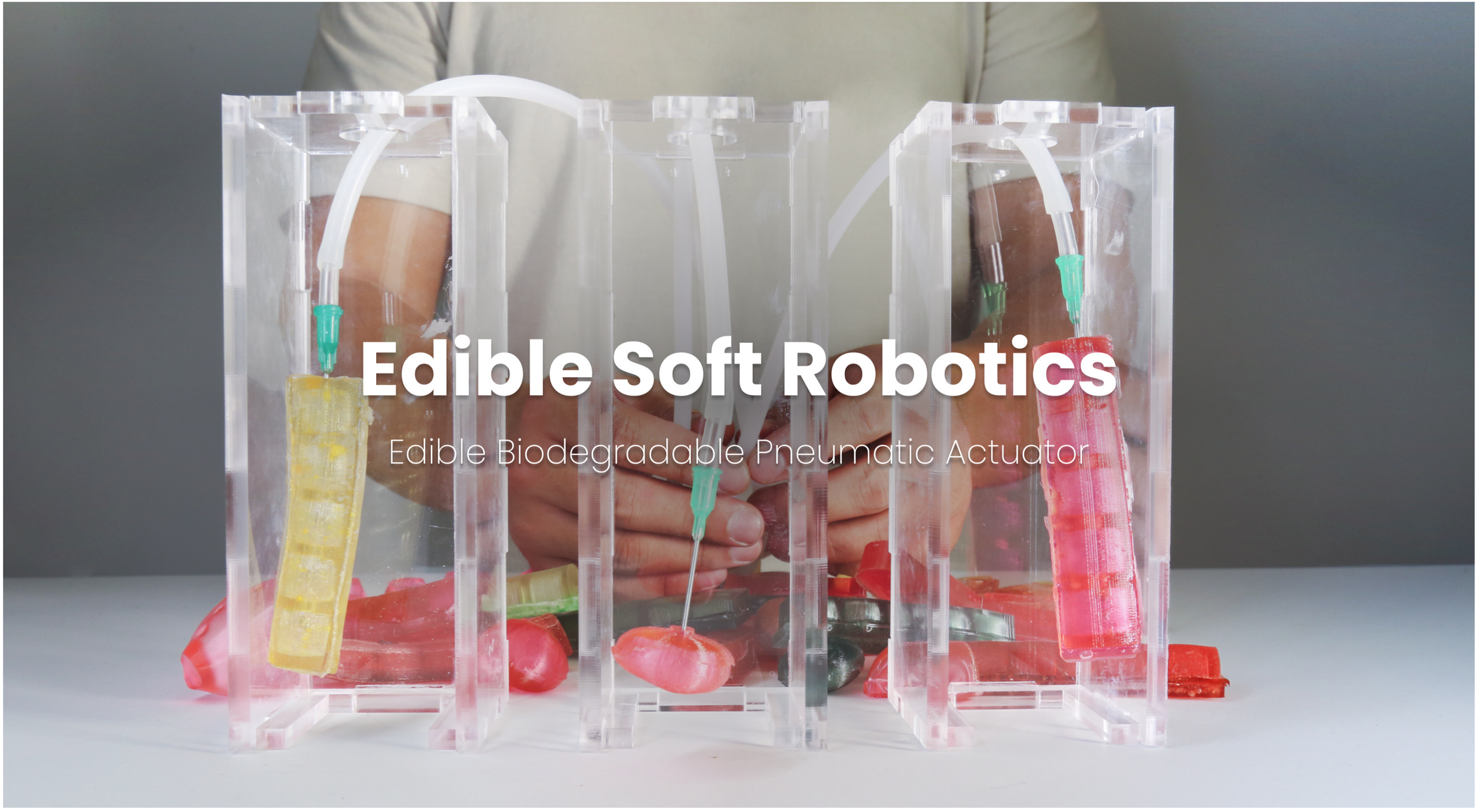
- Collaborated with engineers and product manager to conduct touch screen **performance testing**. Arranged, analyzed and visualized the latency data to deliver estimated best latency interval to optimize the next-generation screen touch user experience.
- Conducted **pilot testing,** designed and refined the gamification tasks, **identified scales** to quantify the effect of touch latency.

Skills

Research | Interview | A/B Test | Card Sorting | Affinity Mapping | Usability Test | Focus Group | Competitive Analysis | Heuristic Evaluation

Design | Wireframing | Rapid-prototyping | Diagramming | Info Architecture | Design System | Product Strategy | 3D Modeling & Rendering

Tool | Figma | Adobe XD | Adobe Creative Suite | Sketch | Unity | Maya | Rhino | Keyshot | HTML | CSS | Javascript


Edible Soft Robotics
Edible Biodegradable Pneumatic Actuator

Background

Overview

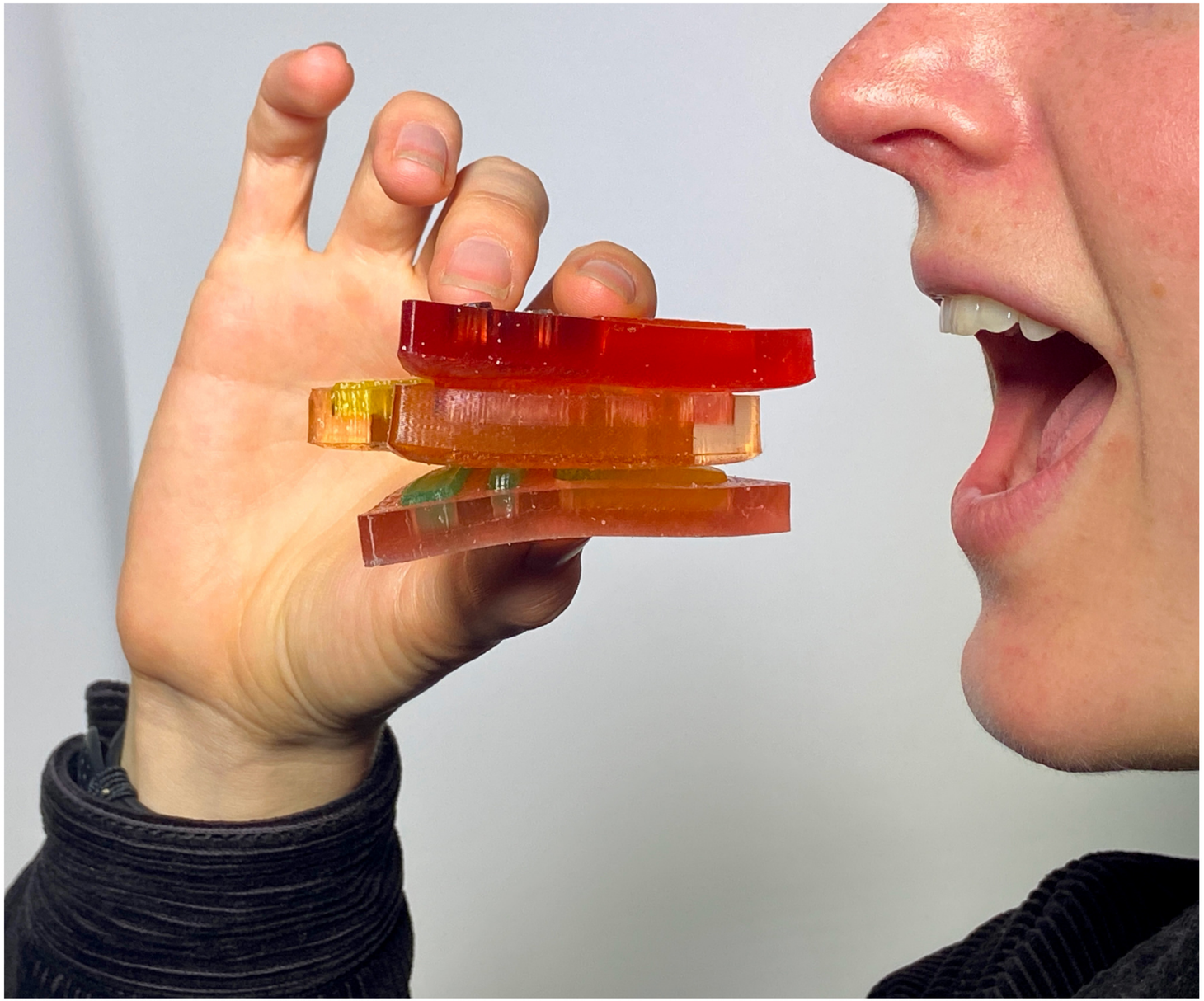
When learning about soft robotics, we found ourselves intrigued by the similarities our silicon molds shared with gelatin. Inspired by our team's shared passion for food and sustainability, we decided to explore potential possibilities for edible, sustainable soft robotics.

My Role

Collaborate with Shikha Shah, Grace Thompson

After delving deep into various literature on gelatin-based materials, I meticulously identified and tested the optimal recipes, honing in on the precise proportions of the constituent materials.

I was entrusted with the responsibility of fabricating the final movable soft robotic components, ensuring their functionality and reliability.



Phase 1 “Edible”

What’s the potential alternative material?

Silicone, with its stability and heat resistance, has been indispensable for soft robotic casting. However, its non-degradable nature presents an environmental challenge. To address this, we explored a range of water-soluble and biodegradable alternatives, including agar, sodium alginate, and gelatin. These materials not only promise functionality but also prioritize sustainability in the realm of soft robotics.

How to fabricate them?

Fabricating with gelatin is a straightforward process. At its core, it involves blending gelatin with a solvent, typically water, then heating the mixture before pouring it into a mold. As it cools, the substance solidifies, acquiring its characteristic jelly-like texture. Interestingly, by incorporating additives such as citric acid, sugar, or glycerin, one can manipulate the physical properties of the gelatin, offering a versatile platform for experimentation and optimization in soft robotics.

Fabrication Stage 1

Pouring Over

Melting

First version prototypes

Property testing

Fabrication Stage 2

Casting

Demolding

Experiment Case

Phase 2 “Robotic”

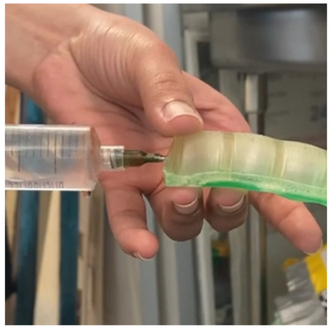
How to achieve required physical properties?

Starting with a 1:1:8 (gelatin:glycerin:water) mix, our material was firm but lacked stretch. Adjusting the ratio by reducing water didn’t achieve desired elasticity. Increasing glycerin to a 1:2:6 mix made it softer. Further experimentation led to the optimal 1:2:3 ratio, yielding a stretchy glycerol gelatin perfect for actuators.

What are the potential applications of this tech?

Given their edible and food-grade nature, these materials present intriguing applications in both dining and medicine. In the culinary realm, they could elevate dining experiences, serving as interactive bubbles reminiscent of culinary alchemy. In medical diagnostics, by integrating pressure sensors, they hold promise for addressing challenges like diagnosing TMJ disorders.

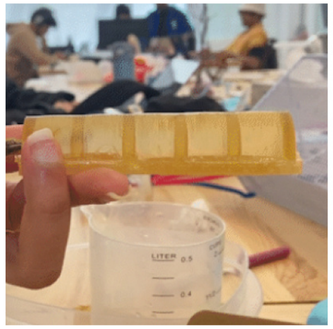
Test round 1



Water injecting

Air pumping

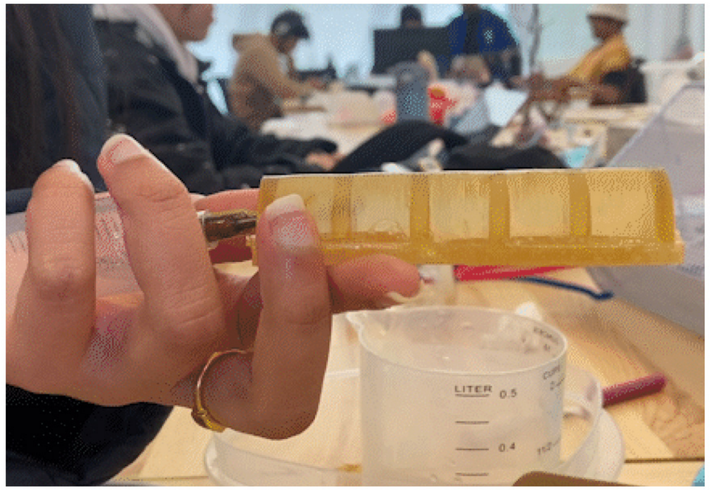
Syringe injecting



Syringe injecting

Test round2

Breathing movement



Bending movement

Final Outcome

What’s good about this experiment?

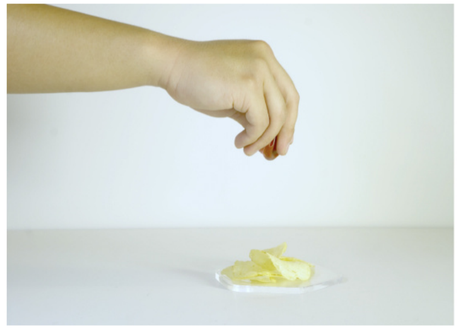
In our experiment, we explored various recipes and gelatin based material combinations, culminating in a substance with ideal physical properties. This breakthrough material, easily dissolvable in water, stands to potentially replace silicone in soft robotics, offering enhanced flexibility and environmental sustainability.

What’s need to be improved next time?

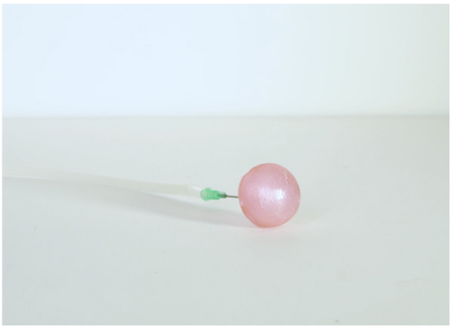
For our next phase, we aim to integrate more bio-based materials into this process, exploring combinations like cellulose and starch, sodium alginate, agar, and pectin. This approach is expected to enhance the biodegradability and eco-friendliness of our material use in prototype, potentially opening up new applications in areas where environmental impact is a critical factor.

Application 1

Water dissolvable

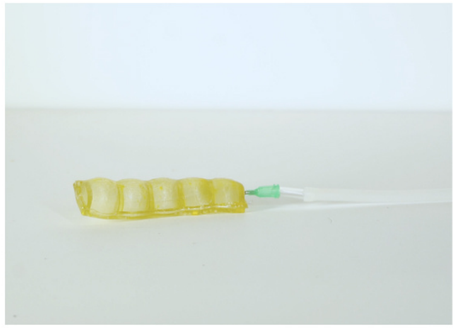


Sauce packaging

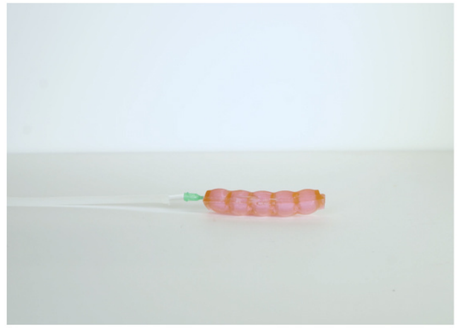


Breathing

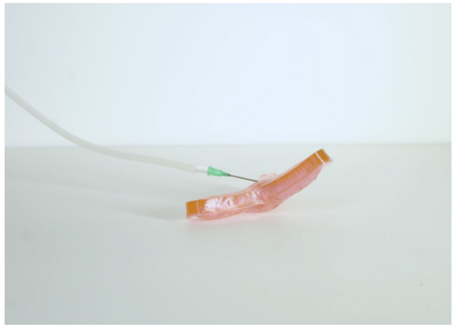
Application 2



Bending 1



Bending 2



Gripping


IDEO
Design @ Large Summer Design Intern

Reflection

Embracing the ambiguity.

From my experience at IDEO, the most crucial lesson I've learned is that design isn't a linear journey from 0 to 1. In real-world industry scenarios, design involves engaging multiple stakeholders in the discussion. It's a multifaceted process where various elements and perspectives intertwine. This understanding highlights that effective design is not just about creativity, but also about integrating diverse needs and viewpoints to create solutions that are both innovative and practical.

Design Thinking in every corner of design.

At IDEO, while design thinking is a cornerstone of our reputation, it's interesting to note that we rarely explicitly mention "design thinking" in our day-to-day work. This concept is so deeply embedded in our culture and practices that it becomes a natural part of our life. It's not just a methodology we apply; it's a mindset that permeates everything we do. This intrinsic integration of design thinking allows us to approach problems creatively and empathetically, making it an inherent aspect of our approach to innovation and problem-solving.

Moments

Shanghai Fusion

Great FXXKING Design

Project Base

Online Interview

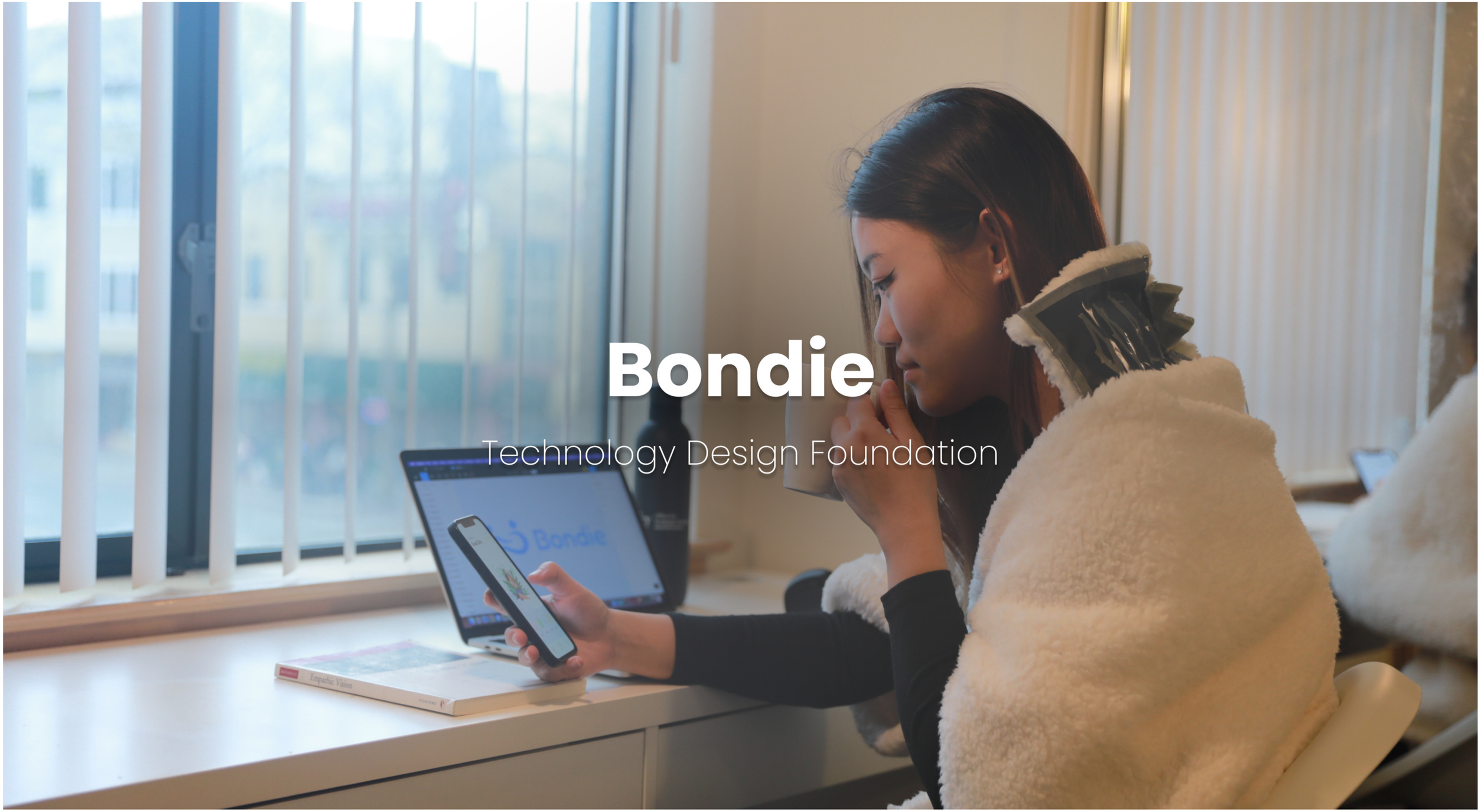
Memories

IDEO Gift1

IDEO Gift2

IDEO Floor Mapping

Our Interns



Bondie

Technology Design Foundation

Background

Overview

Our primary focus is on addressing the challenges of long-distance parenting. Our aim is to mitigate the emotional gap caused by physical distance through the development of an IoT device. This innovative solution is designed to enable parents and children to feel each other's presence, despite being geographically separated. By leveraging technology, we're striving to create a device that not only facilitates communication but also fosters a deeper emotional connection, making the distance feel shorter and the parental bond stronger.

My Role

Collaborate with Winny Wang, Yidie Ling,

Yemoon Cho, Samriddho Ghosh

I was in charge of the programmable fabric fabrication, a key aspect of which involved rendering the process for the final prototype. My responsibilities extended to creating visual additional assets, which were crucial in conveying the intricate details and functionality of the prototype.

Research

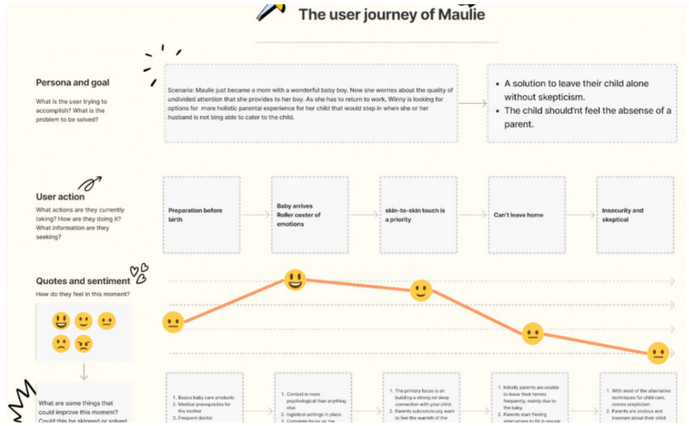
How are we investigate the user journey for parenting?

To better understand the nuances of long-distance parenting, we conducted interviews with various parents. These conversations were aimed at gaining insights into their experiences and challenges, helping us tailor our design to effectively address the specific needs and emotional aspects of parenting across distances. This direct feedback from parents was invaluable in shaping our approach and ensuring that our solution was both empathetic and practical.

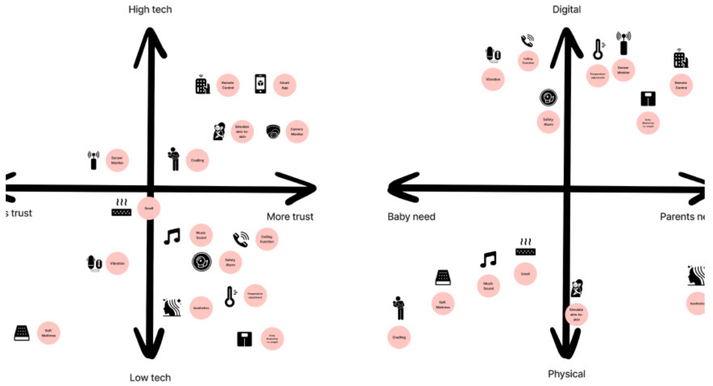
What's the interaction we are imaging?

In our project, we envision creating a bi-directional interaction between parents and children that incorporates multiple dynamics. This concept focuses on facilitating a two-way emotional and physical connection, allowing both parents and children to experience a sense of closeness despite the physical distance.

User Journey

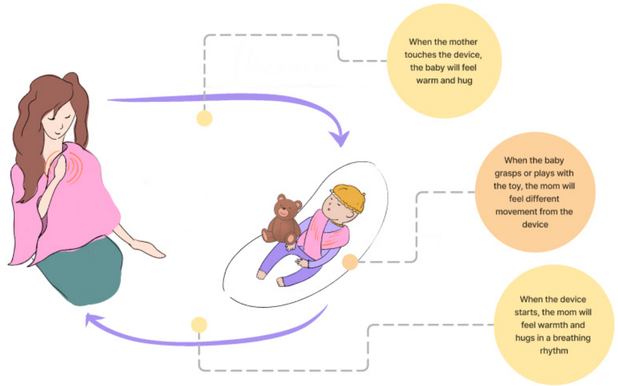


Journey Map

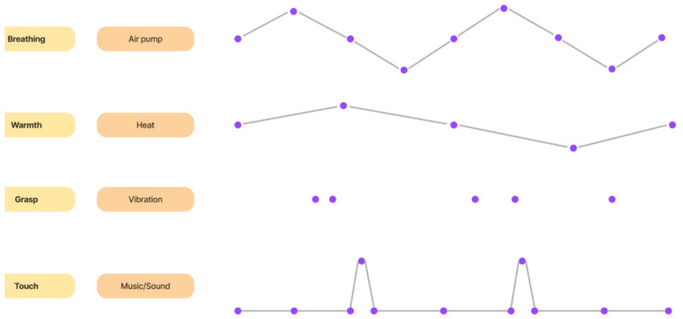


2X2 Analysis

Interaction Pattern



Illustration



Interaction Dynamic

Fabrication 1

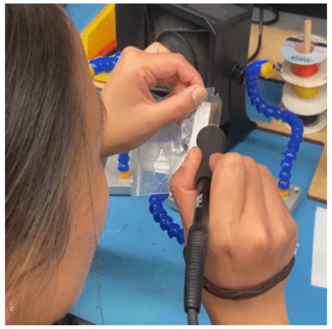
How to achieve required soft goods actuation?

In our endeavor to enhance long-distance parenting through design, we are considering the use of an air compressor to drive the actuation of soft goods. This choice is twofold in its rationale: firstly, the use of soft materials is inherently suitable for parenting, as it evokes a sense of warmth and comfort, essential in replicating the nurturing aspect of a parent's touch.

What are the materials we tested out?

During our design process, we experimented with various materials, including plastic bags, silicone, and soft fabrics, to find the most suitable one for our IoT device. After extensive testing, we ultimately chose vinyl sheets for their ideal combination of flexibility, durability, and ability to convey a comforting touch, essential for enhancing the long-distance parenting experience.

Test round 1



Soldering

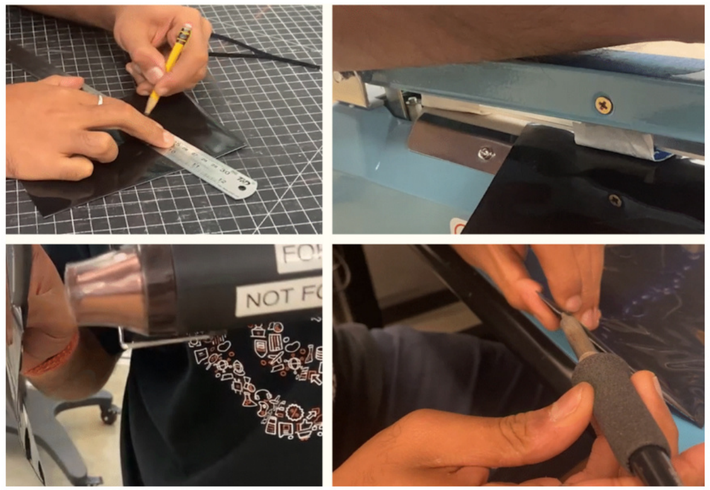
Testing 1

Testing 2

Silicone Testing

Test round2

Early Stage Prototypes



Heat press sealing

Fabrication 2

How to enhance this air-driven motion?

In our design process, we drew inspiration from a research paper published by MIT. This paper provided valuable insights and structures that we could leverage to enhance our own design. By incorporating the concepts and methodologies outlined in the MIT research, we were able to refine our approach, particularly in the structural aspects of our design. Utilizing these proven frameworks allowed us to build on a solid foundation of research, ensuring that our design was both innovative and grounded in scientific principles, thereby elevating the overall effectiveness and reliability of our solution.

Test round 3

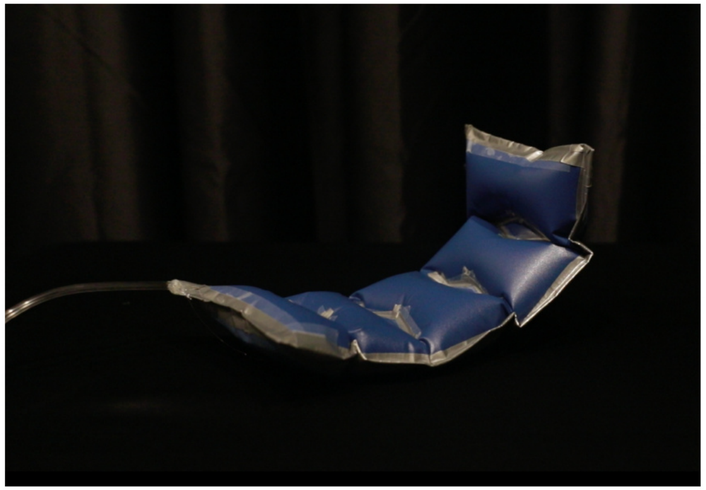
Functional Module

Fabric cover

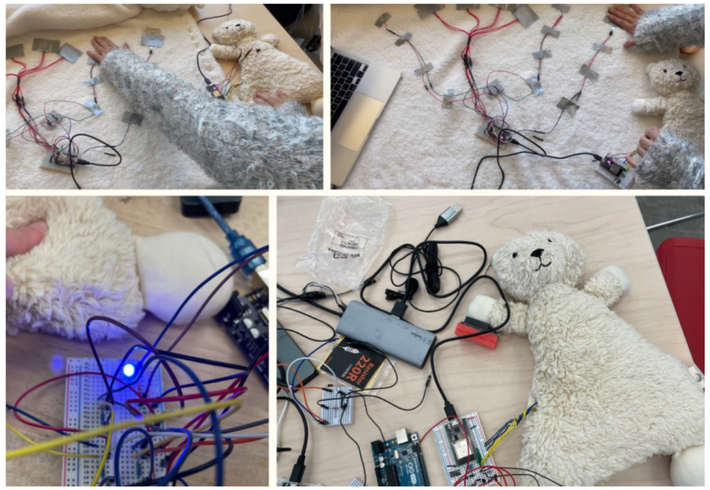
Curling

Structure

Functional Prototype



Curling



Circuits

Final Outcome

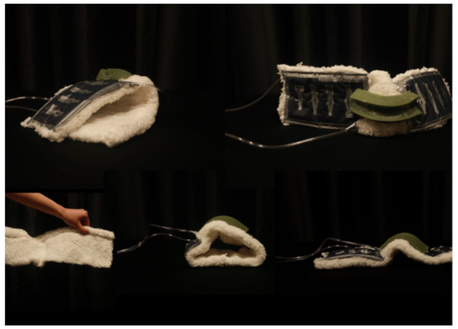
What’s good about this experience design?

This design represents a significant exploration in the realm of soft goods and actuation. The air-driven approach allows for a more dynamic and responsive interaction, which is crucial in replicating the subtle nuances of human touch and presence. This aspect of the design is particularly groundbreaking, as it opens up new possibilities for how soft materials can be used in interactive devices, making the experience more engaging and meaningful.

What’s need to be improved next time?

A dedicated software component would enable us to create a more comprehensive and intuitive user experience. This would involve developing algorithms and interfaces that can accurately interpret and respond to user inputs, making the interaction between parents and children more fluid and natural.

Prototype

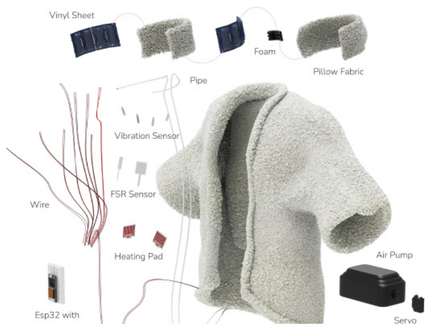


Motion

Wearable

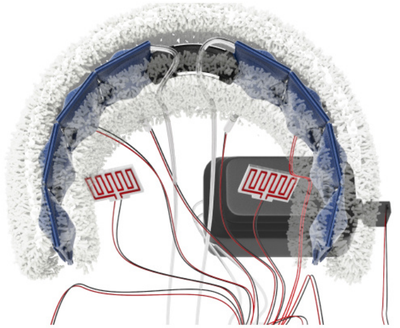
Toy

Rendering

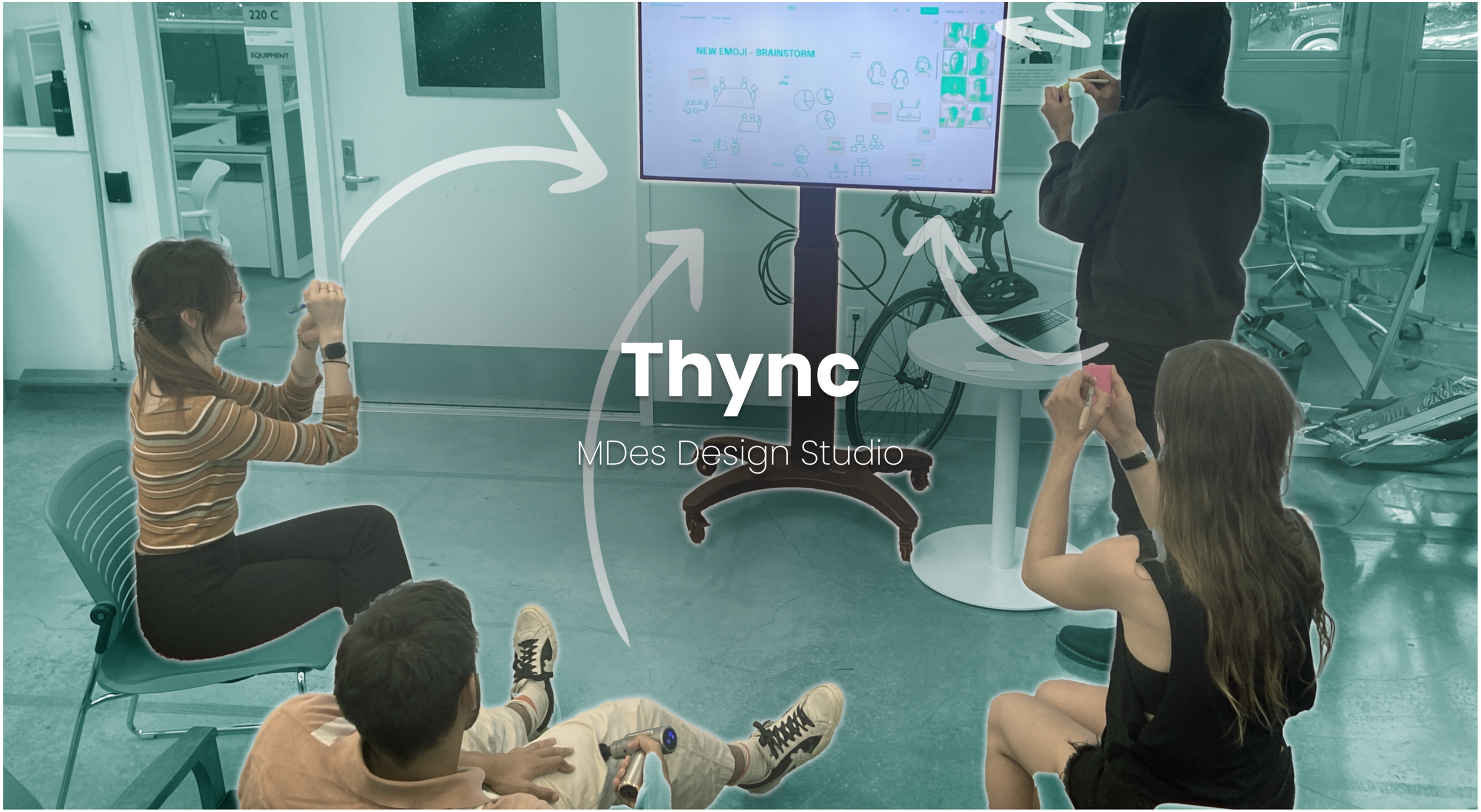


Circuit

Soft goods



X-ray view



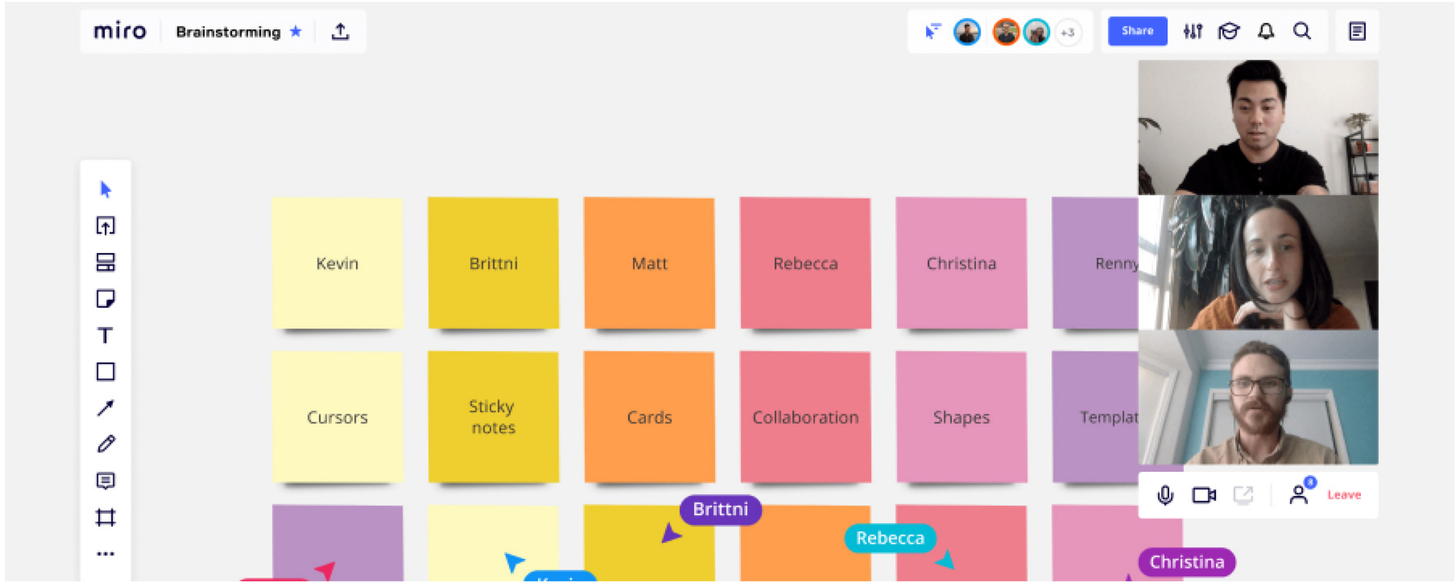
Thync

MDes Design Studio

Background

Overview

Brainstorming originated in 1939 and was introduced by Alex F. Osborn as a collaborative group activity to enhance collective creativity. Despite its wide application across academia and industries, several factors undermined its effectiveness and productivity—facilitators' proficiency, participants' social anxiousness, and group dynamics. As the pandemic transitioned collaborative work from physical to hybrid models, brainstorming posed a challenge in blending physical and digital interactions. However, digital collaborative tools for hybrid working environments still lack physicality and affordability. Although the emergence of AI has brought promising advancements to collaborative industries, current AI lacks the reliability and interactive communication needed for seamless human-AI collaboration.



Research

How do we identify the user pain points and needs?

We conducted preliminary research on brainstorming and hybrid collaboration technologies. For hybrid collaboration, the prevalent solution involves data transition techniques, such as telepresence camera robots that capture on-site workers' faces while presenting online workers' faces, ensuring constant visual engagement. In brainstorming and similar collaborative design activities, interactive whiteboards are extensively used. These touchscreens, equipped with built-in software, allow both on-site and online participants to join sessions. Notable software like Figjam and Miro, leaders in this field, facilitate a digital transformation of traditional brainstorming methods and often employ AI to expand or enhance the content.

We also conducted user interviews to understand the need for hybrid collaboration and brainstorming. Our focus was on professionals with experience in the creative industry and those who have conducted large online events. In the process of interviewing six individuals, including a pilot interview, we organized hybrid brainstorming exercises with varying online and on-site participant ratios to observe interactions and gather immediate feedback. This contextual inquiry helped us understand how to better facilitate these activities in real life and gauge user preferences for AI integration.

Interview Research

Ideation

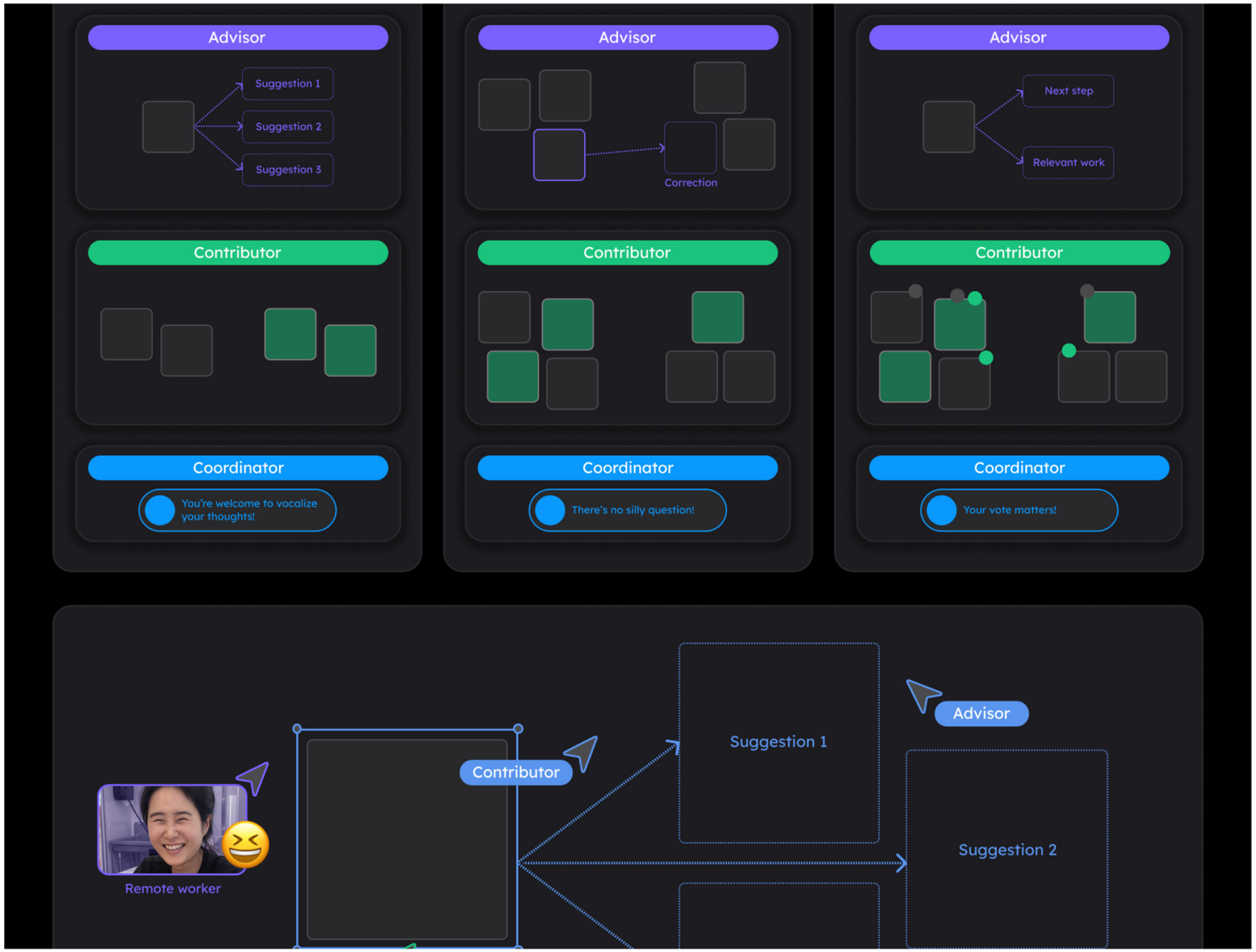
How the AI agents will perform in our system?

In stages where the facilitator role was active, we utilized a lower frequency penalty to prevent repetitive instructions, setting lower key parameters temperature and moderate max_tokens for concise and structured guidance. The prompts were designed to encourage idea-sharing and motivational statements.

For the contributor role, we set a relatively high-frequency penalty to foster new idea generation, with a higher temperature to maintain diversity and creativity, allowing for spontaneous responses. The max_tokens parameter varied according to the human contribution level and the brainstorming stage, with more tokens leading to a greater quantity and detail of ideas. The prompts for this role were more open-ended, reflecting the theme and context.

For the advisor role, we balanced the response with a moderate frequency penalty to maintain focus on the main theme, and a moderate temperature for generativity while ensuring logical analysis. Longer max_tokens allowed for comprehensive analysis, enabling the advisor to delegate tasks rather than directly make decisions. The prompts were structured to analyze materials, extract key points, and offer suggestions.

Interaction Pattern



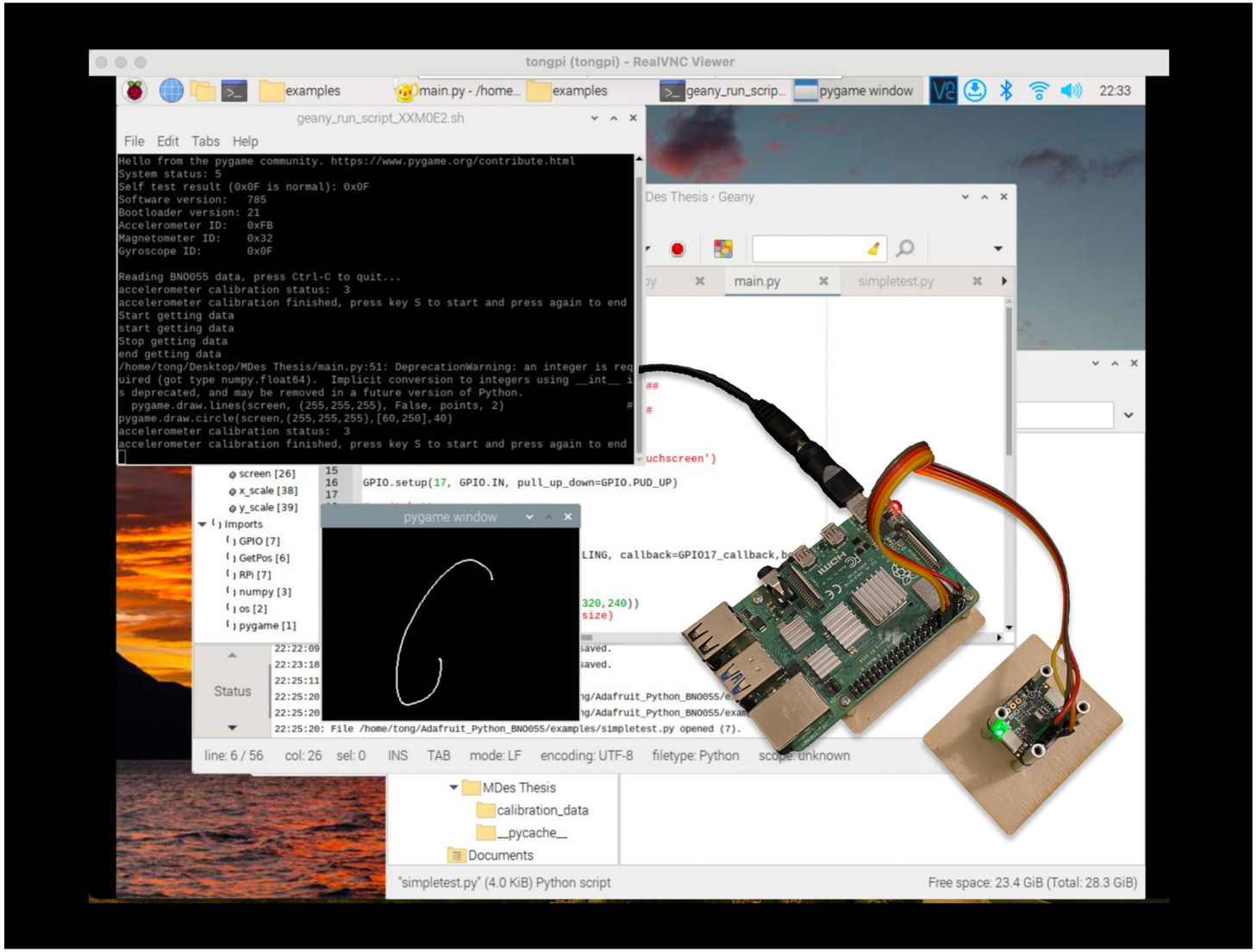
Prototyping

How to we achieve the transcribe techniques?

On the hardware design front, we selected the BNO055 as our Inertial Measurement Unit (IMU) sensor to accurately calculate the trajectory of freehand sketching. This sensor works with a Raspberry Pi through a Stemma QT cable and an I2C connection, with the Pi serving as the primary data processor. Initial calibration involved reading the calibration status of each sensor through the Adafruit_BNO055 library, focusing on four key registers: overall system, gyroscope, magnetometer, and accelerometer. Achieving higher calibration numbers ensures more accurate data.

To refine the raw data, we employed a low-pass Butterworth filter to mitigate spikes and a high-pass filter to eliminate noise, ensuring that the raw acceleration data was usable. For stationary parts, we minimized drift by integrating acceleration data only in non-stationary phases. Quaternion calculations then mapped the IMU sensor's movements, providing a more efficient computation of vector rotation than Euler Angles. The quaternion approach enabled us to convert the acceleration vector from the IMU frame to the world coordinates frame, allowing for accurate remapping of trajectory points on the screen.

Test round2



Final Outcome

Conclusion

This project explores enhancing productivity and creativity in hybrid work environment brainstorming sessions by integrating AI and developing the IdeaTranscribe hardware. This integration aims to rejuvenate the vitality of in-person collaboration and ease the process of hand sketching, addressing the hybrid dilemma of unequal physical access to shared tools like whiteboards. By digitizing hand sketches onto interactive whiteboards, we aim to provide equal access for all members, though challenges in fully immersing remote participants persist.

Our brainstorming process is also significantly enhanced by three customizable AI agents, allowing users to tailor the involvement level of contributor and advisor AIs. This customization aligns with recent advancements in GPT's functionality, emphasizing adaptable, history-aware AI. Unlike typical AI interactions, our method shifts from user-driven prompts to AI-initiated suggestions based on contextual understanding, enhancing the brainstorming process without imposing decisions.

Working Setup