INTERACTION DESIGN

Portfolio.

2024

Personal Works

LIN KAI

Hi, I'm LINKAI



Who am I?

I'm Lin Kai, from Fuzhou University majoring in Landscape Architecture Design. I like to discover the pain points in life and try to explore and propose solutions that can improve the status quo.

I am glad that you can take the time to look at my work!

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Education

Lanscape Architecture Design

Fuzhou University

2020.9–2025.6

Mandarin (native language)
English: IELTS (6.5)

Software Skills

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Interests

Music Art Pets

Photography Psychology

Contents

01 Pet Pals

02 Wish You a Hug

03 Park Musician

04 Access to the Internet

PROJECT 01

Pet Pals

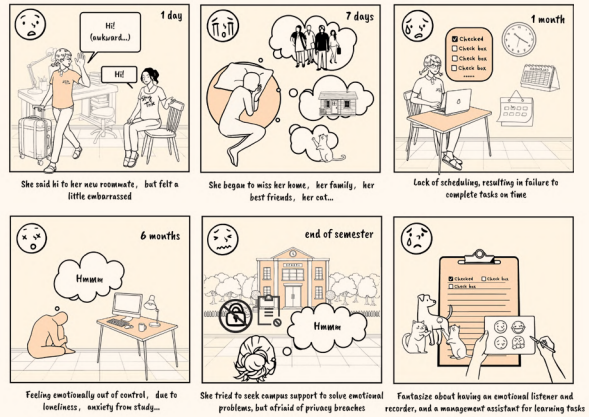
Calendar with **Pets**

In the fast-paced environment of university life, many freshmen struggle with **adaptation, emotional instability, low study efficiency,** and **privacy concerns** when seeking help.

This app offers features like **Emotion recording, Channels for help,** and a **reward system for academic achievements,** aiming to assist freshmen in adjusting to university life more effectively, improving their emotional management, study habits, and social experience, thus laying a strong foundation for their academic journey.



Experience



Questionnaire

Sources of maladjustment to university life

Some respondents had difficulty adapting to the new living and learning environment.

The curriculum and work schedule are so different from high school that some students have difficulty adapting.



Sources of loneliness in college students

Some students find it challenging to socialize and make friends.

Some students prefer self-solving problems and hesitate to seek help.

Background

I .Unable to manage the transition phase

University students often transition from family dependence to greater independence, facing new challenges in **managing time, finances, and relationships.**



II .Academic stress & Psychological problems



College students often face **academic pressure,** struggling to complete tasks on time. This demands time management skills, leading to increased time pressure and psychological stress.

III.The psychological symptoms of procrastination

Poor self-efficacy, lack of confidence and interest and study strategies in academics among college students can lead to **low self-esteem, severe anxiety, irritability, and loss of self-control.**



IV.Campus Services & Privacy Concerns



Campus support services are resources provided by schools to help students with psychological issues.

Students are often **unaware** of this service or are afraid to ask for help from campus services **due to privacy concerns.**

Interview



Respondent 1
Personality: Extroverted
Grade: Freshman

Adjustment problems:
New environment and social pressure
Emotional management:
He will relieve his emotions by chatting with his former friends
Academic stress: Fear of failing the final exam
Seeking help from:
Close classmates, get nervous when interacting with teachers
Attitude towards school support:
know about it, but don't take advantage of it
Expectations: 1.Cute app interfaceattract me to use it.
2.Remind me the progress of my things from time to time

Adjustment problems:
Stress of leaving home, relationship management and learning
Emotional Management:
Looking for a listener and encouragement when feeling anxious.
Seek help from: Prefer to solve problems on her own, or seek help from teachers if she cannot cope independently.
Attitude towards school support: Worried about privacy disclosure.
Expectations: 1. Have a companion to chat with when feel unhappy.
2. Have someone to encourage her and listen to her feelings.



Respondent 2
Personality: INFP
Grade: Freshman



Respondent 3
Grade: Sophomore
Personality: ESFP

Major adjustment problems:
Changes in education style, work and rest schedules
Emotional management:
Occasional meltdowns, need for emotional outpouring
Seek help from: Elder brother, seniors, friends
Attitude towards school support:
Aware but not using, worried about privacy leakage
Expectations: 1. Apps with cute pet images to be attractive.
2. A channel to ask friends and teachers for help.

Painpoints

I. Adaptation issues
–Adapting to a new environment brings emotional and life challenges.
–New curriculum and academic pressure.

II. Privacy concerns
–Campus support services: concerns about privacy leakage.

III. Social stress
–Difficulty in making friends in a new environment and feeling lonely.
–Tendency to solve problems alone due to introversion.

IV. Emotion Management
–Negative emotions caused by maladjustment, frequent mood swings.
–Tendency to deal with emotions alone, unwilling to share with others.



Expectations

I. Emotional support

Listeners and encouragement, emotional support to help relieve anxiety and stress.

II. Channels for help

Classmates' help: Seek help from friendly classmates.
Online help: Ask teachers questions online to avoid embarrassment.

III. Functional expectations

Entertainment and interaction: Listen to music and socialize when feeling low.
Explore the outside world: Experience exploring the world outside.

Market Analysis

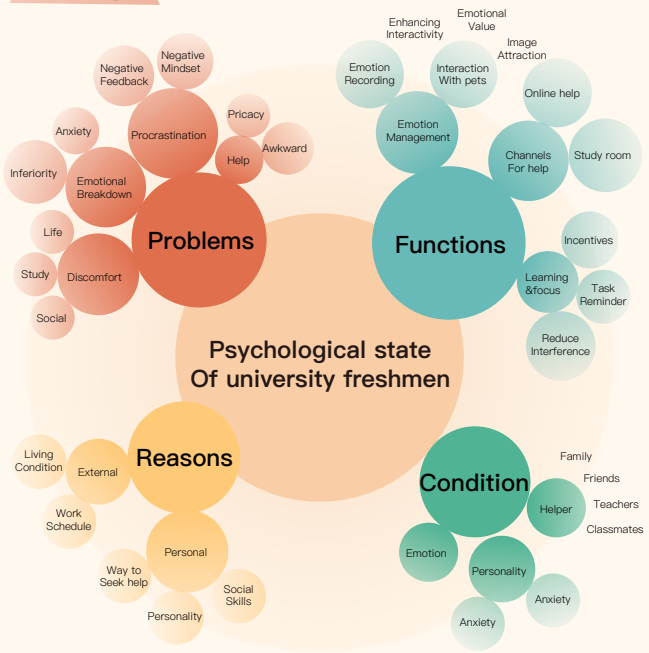
		Functions	Advantages	Disadvantages
Fatty cat	Interface style: ★★★ Emotional support: ★★★ Study management: ★★★★	·Learning companion ·Recording of learning ·Focus record visualisation	·**Reward mechanism** ·Visualization ·Attractive appearance	·Single function. ·Single interface style. ·Lack of social features ·Death mechanism
Emmo note	Interface style: ★★★★ Emotional support: ★★★★★ Study management: ★	·Emotion recording ·Diary writing ·Emotion report visualisation	·**Emotional record tracking.** ·Improving self-awareness of emotions. ·Highly personalised and customisable. ·Strong privacy	·Single function ·Lack of social features
Lonely bird	Interface style: ★★★★★ Emotional support: ★★★★★ Study management: ★	·Interaction and Chat ·Daily companionship ·Emotional encouragement	·**Emotional support** ·Realistic interaction ·**Lovely images**	·Single function ·Lack of social function ·Lack of personalisation
Ticktick list	Interface style: ★★★ Emotional support: ★ Study management: ★★★★★	·Time management ·Task management ·Calendar	·Enhances productivity ·**Task organization and categorization** ·**Timely reminders and notifications** ·Customizable task lists	·Simple&unattractive interface ·Lack of incentives
Forest	Interface style: ★★★★ Emotional support: ★★ Study management: ★★★★★	·Grows a virtual tree for motivation ·Focus management ·Phone usage restrictions ·Statistical analysis	·**Helps users stay focused.** ·Boosts productivity. ·Engaging gamified experience. ·Visual Rewards	·Limited Features ·Lack of whitelist function

Conclusion

There are applications on the market that meet different needs for different users. However, there are fewer applications in the market for the psychological and emotional problems of college students, and the **lack of emotional support and online help functions** can't well solve the problems of students' emotional management and help-seeking problems.



Mindmap



Ideation

What can be done to solve the problem?

Learning and focus

Incentives for learning
- Increase motivation
- Improve concentration
- Improve self-control

Calendar, to-do function
- Task management function
- Provide task management tips
- Task reminders

Emotional output

Virtual Interactive Objects
- Emotional feedback
- Provide encouraging support
- Enhance self-confidence

Emotion management
- Record and visualise emotions
- Provide channels to express emotions

Provide channels

Social functions, help channels
- Connect with classmates and friends
- Anonymously ask teachers and counsellors for help.

What functionality can be added to the app?

- Users earn points by keeping learning and focusing, which can be used to exchange for pet appearance and physical rewards.
- Record the user's learning and concentration to enhance the sense of achievement.

- Provides various scientific learning methods, users can choose according to their own preferences
- Virtual pets to remind users of tasks

- Dialogue and game interaction with pets
- Different chat contents according to the user's recent mood condition
- Reality correlation (pet appearance changes according to time of day, weather)

- Record user's emotions in the form of diary, emoji and regular visualisation reports.
- Talk to your pet about your emotions, while your pet records and encourages you.

- Can share their difficulties and experiences with friends through the pet visiting function
- Users can consult counsellors and psychologists with virtual pets.

Why choose Pet Image?

Theoretical support:
- People have a clear preference for the physical appearance of their pets, such as large eyes, round faces, and other "cute" features.
- This preference may stem from the protective instinct that humans have for their young.

User research results:
- Many college students like pets but don't have the time or conditions to keep them.
- E-pets have low time and management costs and do not require much time and effort.

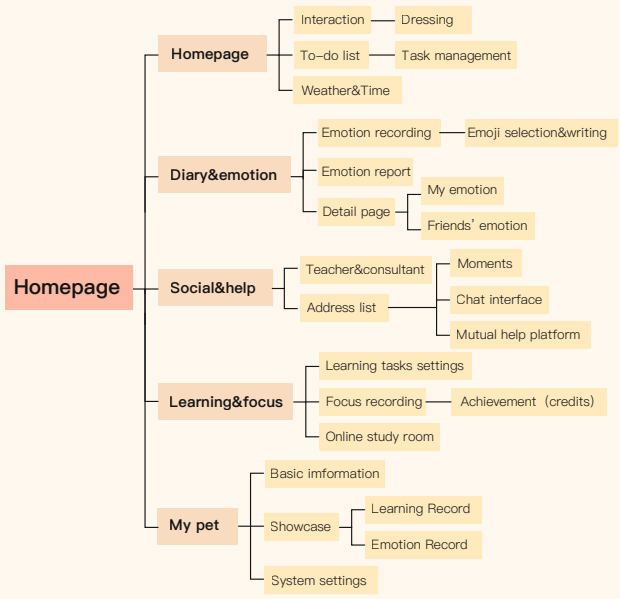
Emotional support provided by virtual pets:
- Can provide a sense of companionship and help alleviate loneliness and anxiety by interacting with them, bringing relaxation and pleasure.
- There is a sense of satisfaction and pride in caring for a virtual pet.

Market Research:
- Fewer virtual pets are available with relevant function points that address the psychological condition of college students.

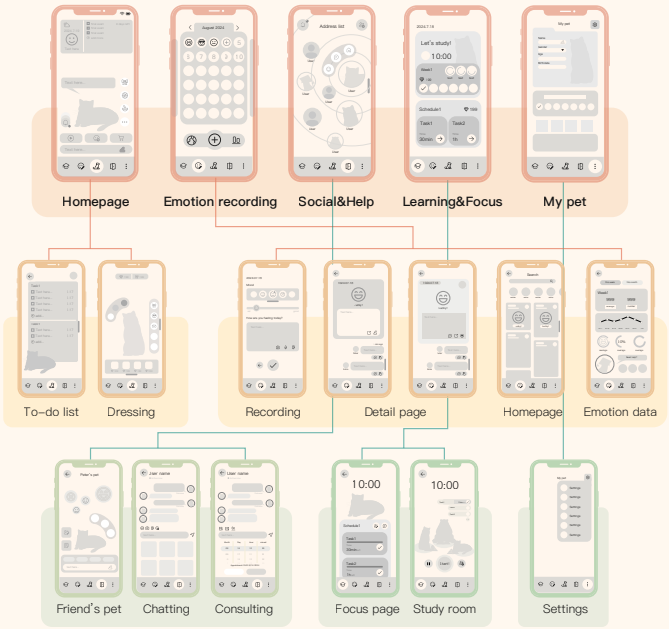
What features are not available in other apps?

- Social support function
- Reward mechanism
- Emotion management function
- Attractive and personalised interface style

Structure



Low Fidelity



Element Design

Main color

Theme color

Pink and flesh pink are more relatable as body colours shared by both humans and pets

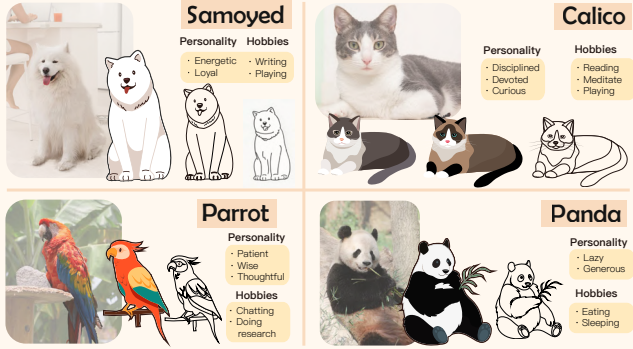


#FFEEC2 #FDDFC3 #FFBEA9

Decorative color



Pet image design



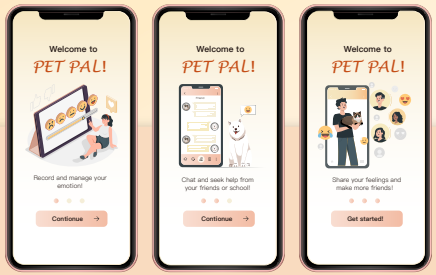
Logo design



Icon design

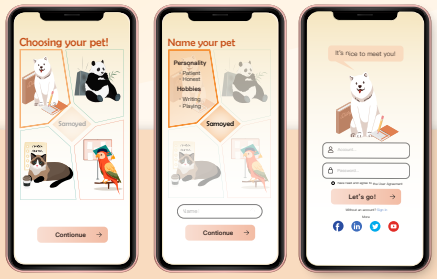


High Fidelity



Welcome Page

The welcome page shows users the emotion logging, pet chatting, and social help functions in turn.



Sign up page

Sign up page provides users with four different types of pet images to choose from, each pet has different hobbies, personality traits, to meet different users' personalities and preferences



Homepage

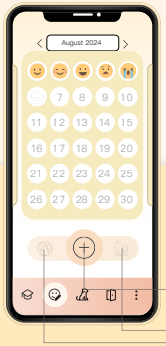
The home page is the interface for displaying the user's pet, where the user can interact with the pet, create to-do lists, check the weather, etc..

To-do list

Users can record their schedules through the home screen, or interact directly with their pets, as well as prioritise tasks through the secondary screen.

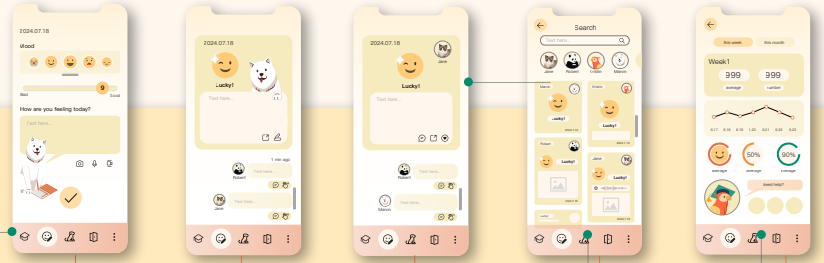
Dressing

The shop page offers different types and styles of pet decora-tions, and users can spend points to personalise the appear-ance of their pets according to their own preferences.



Emotion recording

In the emotion recording page, the user's mood records are displayed in units of months, and the user can recall the mood records of the day by clicking the corresponding date.



Recording

Users can enter the emotion record page by clicking on the corresponding date, select emoji, emotion value, emotion description and upload photos, audio or video to record the emotion of the day.

Detail page

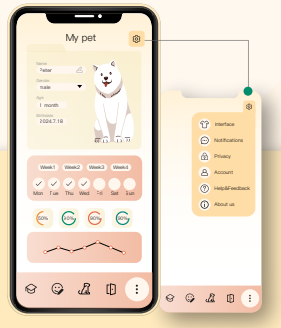
Detail page for personal interface and friends interface, the user in the personal interface can be edited, sharing operations; in the friends interface can be liked, commented on, shared and other interactive operations

Mood Square

Users can search and view their friends' recent moods on the Mood Square page and interact with them by going to the details page.

Emotion data

Users can view the recent emotion data in this interface, if the user's mood data is not optimis-tic, the user can choose to use this page to quickly ask for help from friends and teachers.



My pet

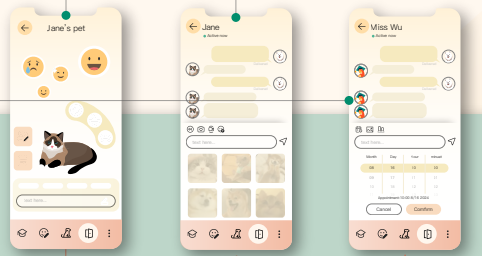
Includes basic infor-mation about the pet, system settings, and displays of emotions and achievements.

Settings



Social&Help

Social&Help page show avatars of friends, families, teachers and school helpers that users can click on for chatting, pet visits and online counselling.

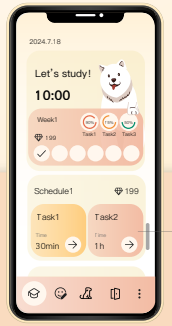


Friend's pet

Users can interact with their friends' pets, leave messages to their friends, and view their friends' recent moods on their friends' pets page.

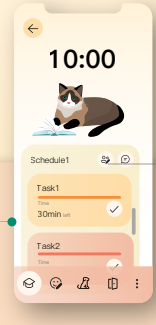
Chatting&Consulting

Users can chat with friends in the Chat interface and invite friends into the study room to study together; the Help and Consultation interface allows users to book an online consulta-tion time and communicate anonymously with teachers online.



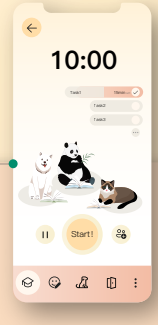
Learning&Focus

Users on the Learning page are able to earn points by completing learn-ing tasks and staying focused, which can be used to purchase pet deco-rations.



Focus page

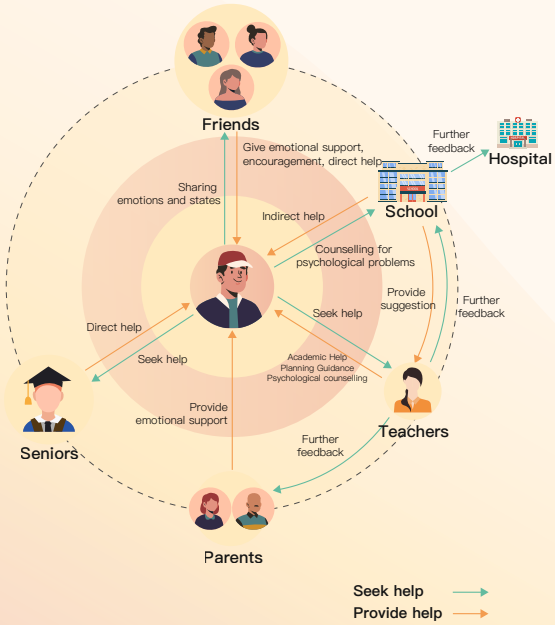
The pet also switches to the learning state when the user enters the focus; if there is a learning problem, users can quickly ask for help from their friends on this page.



Study room

The study room is a pet image instead of a user gathered in the centre of the screen; users can exchange questions with their friends at any time

Stakeholders Map



Storyboard

Student



Beginning university and feeling uncomfortable with university life

Choose his favourite pets to adopt and interact

Record his moods and share them with friends, and discover new friends through the Mood Plaza!

Seek help from a close friend, family member or campus

Become more comfortable with college life

Friends & Seniors



Chat with the user and receive requests for help

Communicate and answer academic questions

Sharing campus life experience and tips

Invite to study together, monitor each other and discipline together

Gainning more intimacy with his friends

School & Teacher



Teacher receives request for help from student

Arranging counselling and providing feedback to school bodies

Teachers provide further feedback to specialists for professional advice

Teachers provide direct help to students

Student difficulties resolved while privacy is safeguarded

Feedback

Main page 【4.6】



Interface style: ★★★★½

"Cute pet images can attract me to use it, I especially like that dog image."

"I wish there were more types of pets and dress-ups for me to choose from."

Social&help: ★★★★½

"I think the social features helped me overcome my social difficulties when I started school."
"The use of a pet figure to socialise, learn and ask for help instead of the user also ensured my privacy."

【4.7】 Social&help



Learning&focus 【4.2】



Learning&focus: ★★★★

The point rewards will give me some incentive to learn and hopefully add more purchasable items than just pet dress-ups.

Emotion management: ★★★★★

"I like to use emoji to record my mood in this way, the visualisation is stronger, but also through data analysis to understand my recent mood state. "

"At the same time, online help can better help me to adjust my emotions."

【4.8】 Emotion recording



Display



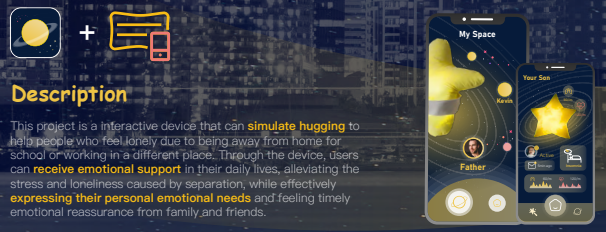




PROJECT 02

Wish you a Hug

Interactive Device | Sercive Design



Description

This project is a interactive device that can **simulate hugging** to help people who feel lonely due to being away from home for school or working in a different place. Through the device, users can **receive emotional support** in their daily lives, alleviating the stress and loneliness caused by separation, while effectively **expressing their personal emotional needs** and feeling timely emotional reassurance from family and friends.



Inspiration

Personal Experience



01

My solo internship

When leaving home and friends and go alone into a new environment, I feel lonely and find it difficult to make new friends.

Depressed & lonely

If I can't contact with others for a long time, I feel lonely and cannot express my feelings well.

02





03

"I want a hug"

I miss my friends, parents, and remember how I felt when I hugged them, felt supported and encouraged.

Hugging dolls to relieve

I usually try to relieve my exhaustion and loneliness by hugging dolls.

04





05

"I want you to know"

I hope that the person who I want to hug can understand my feelings at that moment, and I also want to get comfort from them.

Background

Population data

Migrant workers:

In 2023, China has a mobile population of about **300 million** people, most of whom are **migrant workers**. Among those **70%** are young and **middle-aged people**.

300M

Population of workers away from home in China



Percentage of young and middle-aged **70%**

College graduates who work in cities other than their hometown:

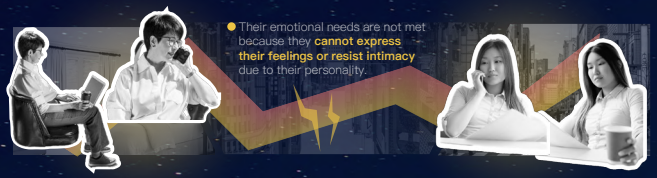
In 2023, **50-60%** of graduates in China **work in cities away from their hometowns**. Each year, many choose nearby provinces with better job opportunities and higher salaries. In 2023, about **25-30%** of graduates **worked in nearby provinces**.



Graduates working in cities other than their home towns

Graduates in cross-province employment

Current status of human emotional needs



- Their emotional needs are not met because they **cannot express their feelings or resist intimacy** due to their personality.
- In modern society, people miss their family because they are separated from their family and friends due to work and other reasons, which **prevents them from having frequent contact** with family and friends.
- If people working or studying in a new environment for the first time, they might **feel lonely or socially isolated** in the long term. They need emotional support to alleviate loneliness.

Research

Students working/schooling away from home



- **Unfamiliarity with the new environment**

Graduates working away from home face challenges like **adapting to a new environment, building a social network, and living independently**, which can lead to increased psychological pressure and issues.

- **Lack of social support**

Being away from their home and family and working in a different city, these graduates **don't have enough social support** in their city, which can further exacerbate their mental health problems.

Impact of parents working outside the home all year round



- **Multiple pressures**

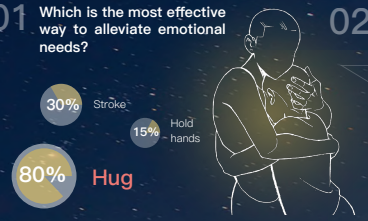
Studies show that migrant workers face a **higher risk of depression and anxiety** due to long-term family separation, lack of social support, high work intensity, and financial pressures. About **10-20%** suffer from depression and **8-15%** from anxiety, rates significantly higher than the general population.

- **Family estrangement**

Some people are separated from their children and spouses for a long time, which has far-reaching effects on family relationships. **Left-behind children** may face problems such as **emotional deficiency and mental health** due to the lack of parental companionship.

Resolution of emotional needs

01 **Which is the most effective way to alleviate emotional needs?**



02 **How do hugs make you feel?**

- Soothing
- Increase intimacy
- Reduce pressure
- Ease loneliness
- Reduce anxiety

The physical benefits of hugging



Hormones

Hugging stimulates the brain to **release a number of hormones** that help relieve stress and relax the body while providing emotional comfort and support.

Dopamine: increases feelings of pleasure and motivation, brings a sense of fulfillment and happiness

Cortisol: reduces stress by lowering cortisol levels

Endorphins & serotonin: stabilizes mood; relieves pain and reduces physical discomfort

Oxytocin: increases overall happiness and security, reduces stress and anxiety

Interview

In order to understand people's hugging situation and hugging needs, I selected four relevant respondents for interviews.



NO.1 Ms.Zhou

"Living and working alone is exhausting. I rarely see friends and family due to distance, and I **feel lonely at work**."

"I have no friends here and feel unhappy, and I **lack time to talk to family and get support**."

Age: 23
Career: intern
Location:Xiamen,Fujian

Working and living alone in other city



NO.2 Mr.Huang

Age: 40
Career: business
Location:Xiamen,Fujian

Frequently travelling on business

"I feel guilty for not being present at many of my children's important moments. I would like to **encourage them as much as possible**."

"When I'm tired or depressed, the lack of communication makes it **hard to get the understanding and support I need from them**."



NO.3 Mr.Chen

"As I work and live in a different place from my partner, I have **little opportunities to communicate with my partner**."

"When I am lonely and feel pressure, I **miss the warmth and embrace of my girlfriend**."

Age: 25
Career: IT
Location:Fuzhou,Fujian

Working off-site with his partner



NO.4 Mr.Wu

Age: 21
Career: student
Location:Shenzhen,Guangdong

Introverted, not good at expressing emotions

"I'm introverted and **struggle to express emotions**, often **hiding my negative feelings**. As a result, I rarely hug others and feel lonelier."

"Though I like being hugged, I prefer handling emotions on my own, which **makes communication even harder**."

Persona



University graduate
Age: 25
Career: IT
Frequency of home visits: Half a year

Painpoints

I . Loneliness
II . Hesitant to seek comfort
III. Unfulfilled social needs

Expectations

I . Emotional connection:
A way for family and friends to understand her emotional state and offer support.

II . Hug simulation:
A method to feel warmth and comfort without needing physical contact.

III. Passive emotional comfort:
A system that provides comfort without requiring her to ask for it directly.



Businessman father
Age: 40
Career: Business
Frequency of home visits: Twice a month

Painpoints

I . Lack of connection
II . Desire for active understanding
III. Absence of partner's presence

Expectations

I . Family warmth at a distance:
A way to feel loved and supported by his family even when not physically present.

II . Emotional comfort from family:
A method for his children to offer active emotional understanding and comfort.

III. Remote partner connection:
A way to feel his partner's comforting presence and hugs, even when apart.

Ideation

Aiming at the above user's pain points and needs, propose the problems to be solved by the design and the corresponding solutions.

Users

- Young people working/studying away from home
- The parents, middle-aged people who often work outside the home

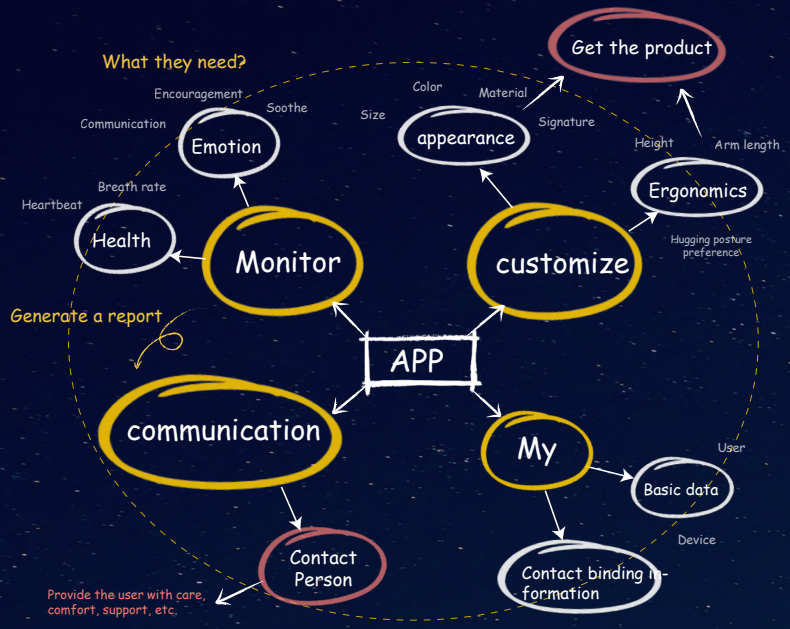
What they need?

- Working away from home, and separating from family and friends, resulting a sense of loneliness from time to time.
- Unable to relieve the pressure of work and study in time, resulting in the accumulation of anxiety and negative psychological impacts.
- The family can not feel their emotional need due to lack of the ability to express their emotions
- Have a subtle need for intimacy
- Due to their personalities, they are unable to express their emotional needs in a new environment by seeking a suitable partner.
- Separated from family due to work

What can we provide?

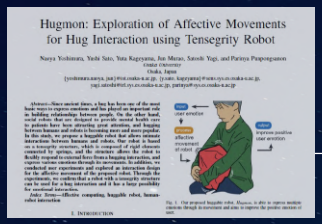
- Provide a way to feel each other's presence remotely to alleviate the user's sense of loneliness to a certain extent.
- The device provides a soft, comfortable hugging experience, which relieves stress to a certain extent and satisfies the user's emotional needs.
- Create an APP that connects the user with friends and family, helping to effectively communicate emotional needs.
- The device can monitor the user's mood and health status in real time and provide feedback to friends and relatives, reminding them to pay attention to the user's physical and mental health.

Mindmap



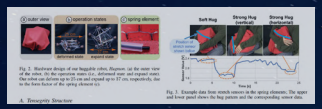
Reference

Feasibility of hugging devices



Hugmon: Exploration of Affective Movements for Hug Interaction using Tensegrity Robot

Improvement of user's mood through **adjustable hugging devices:**

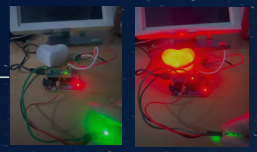


This essay describes the development of a huggable robot called Hugmon, which is based on a tensile structure. The tension structure allows the robot to flexibly respond to external forces generated by hugging interactions and to express various emotions through its movements. The paper finds that **robots with tension structures can be used for hugging interactions and have great potential for emotional interactions.**

How to simulate hug?



Air pump + lung-shaped inflatable bag



Heartbeat Simulation Lighting Unit

Hugging property extraction: physical properties such as **heart rate** and **chest rise and fall** of the other person can be tangibly felt during hugging are **extracted and simulated using relevant hardware.**

Summary

Based on the feasibility of the device to provide a hugging experience, I will design a hugging device that can provide a **comfortable hugging experience** and **can be manipulated by app** to change its parameters to simulate the provision of a hug to the user, thus providing emotional support to the user.

Simulation

Manipulation

Design concept

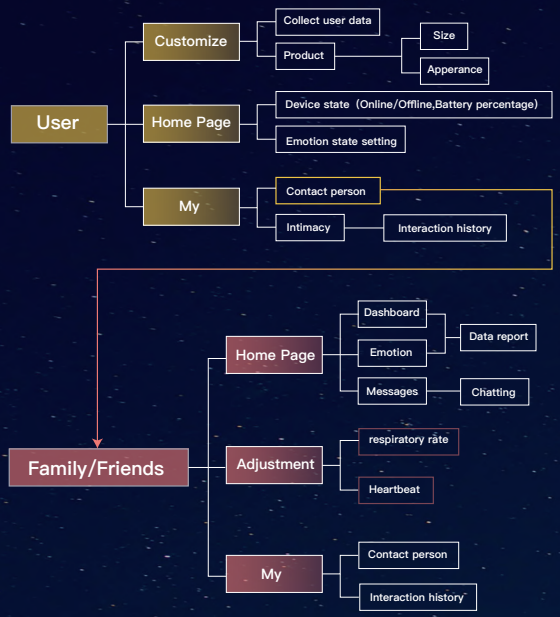


The device takes the form of **a common pillow** and uses **a heartbeat sensor** and **an app-based emotion tracker** to record the user's health data and express their current emotional state, **helping the user convey their emotional needs to others**. The device **provides a comforting hug experience** through rising and falling movements and light flashes.



While using the device, the user can **send messages** to selected contacts (such as family and friends). The recipients will receive these messages, allowing them to **promptly sense the user's emotional needs and state**. They can then respond to the user's emotions through an app, **adjusting the device's reactions** (like the frequency of movements and light flashes) to **provide effective remote companionship and emotional comfort**.

App structure

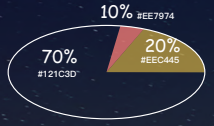


Design elements

Color

Dark colours:

The night sky brings a **quiet and ethereal** feeling, giving the interface night sky colours can help to **stabilise the user's mood**.



Space theme



Space elements:

In China, people will use the moon to miss the other person who is far away from home, so the full moon is used as a **symbol of family and friends**. Stars also represent good wishes.



Star ring:

The way the stars surround each other has a sense of **interaction and companionship.**

Logo

Logo will **change** according to the appearance of the customised product.



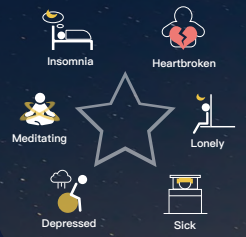
Fonts

Aa Bb Cc Dd Ee Ff Gg 12345

Source Sans Variable

Icons

Some of the **main scenarios with high emotional demands** have been selected for users to choose from:



Sketch



Low Fidelity



High Fidelity

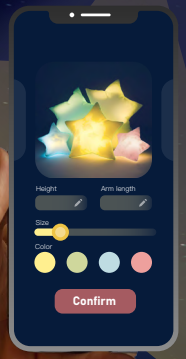


Get Product → Use Product → Get feedback



STEP 1

User open the APP and **customize** the product



Customize

Users can adjust the **shape and appearance** of the product according to their own preferences, and then submit the customisation requirements to the manufacturer.

STEP 2

User choose to add family members or friends as their **contacts**, and remind them to install the console app



My Space

Display the **family members or friends** added by the user, the user can view the details by clicking on the corresponding avatar

STEP 3

The app starts **collecting user data** and **feeding data further back** to their contacts via the app



Homepage

The home page displays the user's **health data, emotional needs and emotional states**, and chat interface buttons



STEP 4

The controller **adjusts the device** to soothe the user



Adjustment

The user's friends and family can **adjust the parameters of the device** in the app and **view and track the user's mood and state of health**

Flow Chart

Remote console

Wifi（ESP8266） ← App

Remote control by sending commands via **Wi-Fi module (ESP8266)**

Receive data on flashing frequency and air pump frequency from a remote server via **serial port or HTTP request**

Device

Computer — Arduino

Air pumps + Air bags

LED



Use **Wi-Fi** to receive control commands and **Arduino code** to control the flashing frequency of the lights and the drumming frequency of the air pump

Prototype

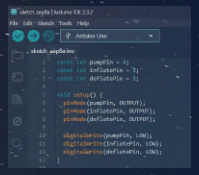
Materials

I purchased a star shaped pillow, attached it to the air pump, the light fixture, and used velcro to secure the pieces together.

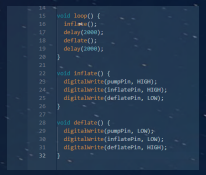




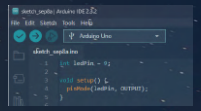

Coding



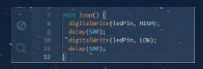
Setting the initial state of the air pump



Setting the inflation and deflation interval

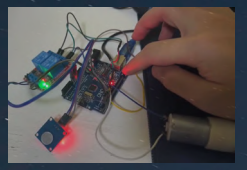


Setting the initial state of the light

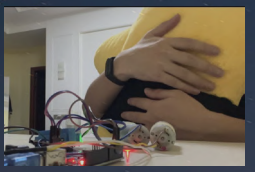
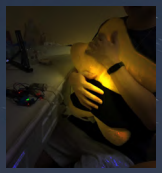


Setting the light flashing interval

Testing

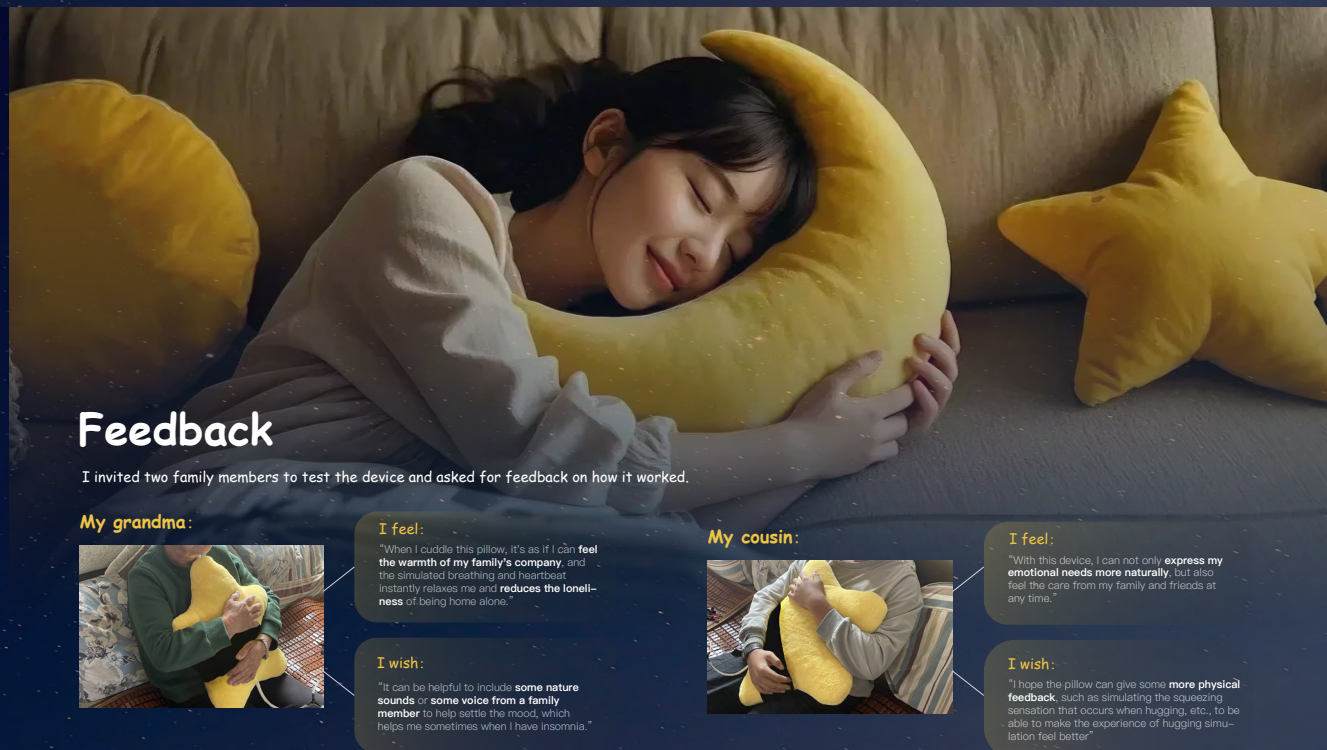




Storyboard





Feedback

I invited two family members to test the device and asked for feedback on how it worked.

My grandma:

I feel:

"When I cuddle this pillow, it's as if I can **feel the warmth of my family's company**, and the simulated breathing and heartbeat instantly relaxes me and **reduces the loneliness** of being home alone."

I wish:

"It can be helpful to include **some nature sounds** or **some voice from a family member** to help settle the mood, which helps me sometimes when I have insomnia."

My cousin:

I feel:

"With this device, I can not only **express my emotional needs more naturally**, but also feel the care from my family and friends at any time."

I wish:

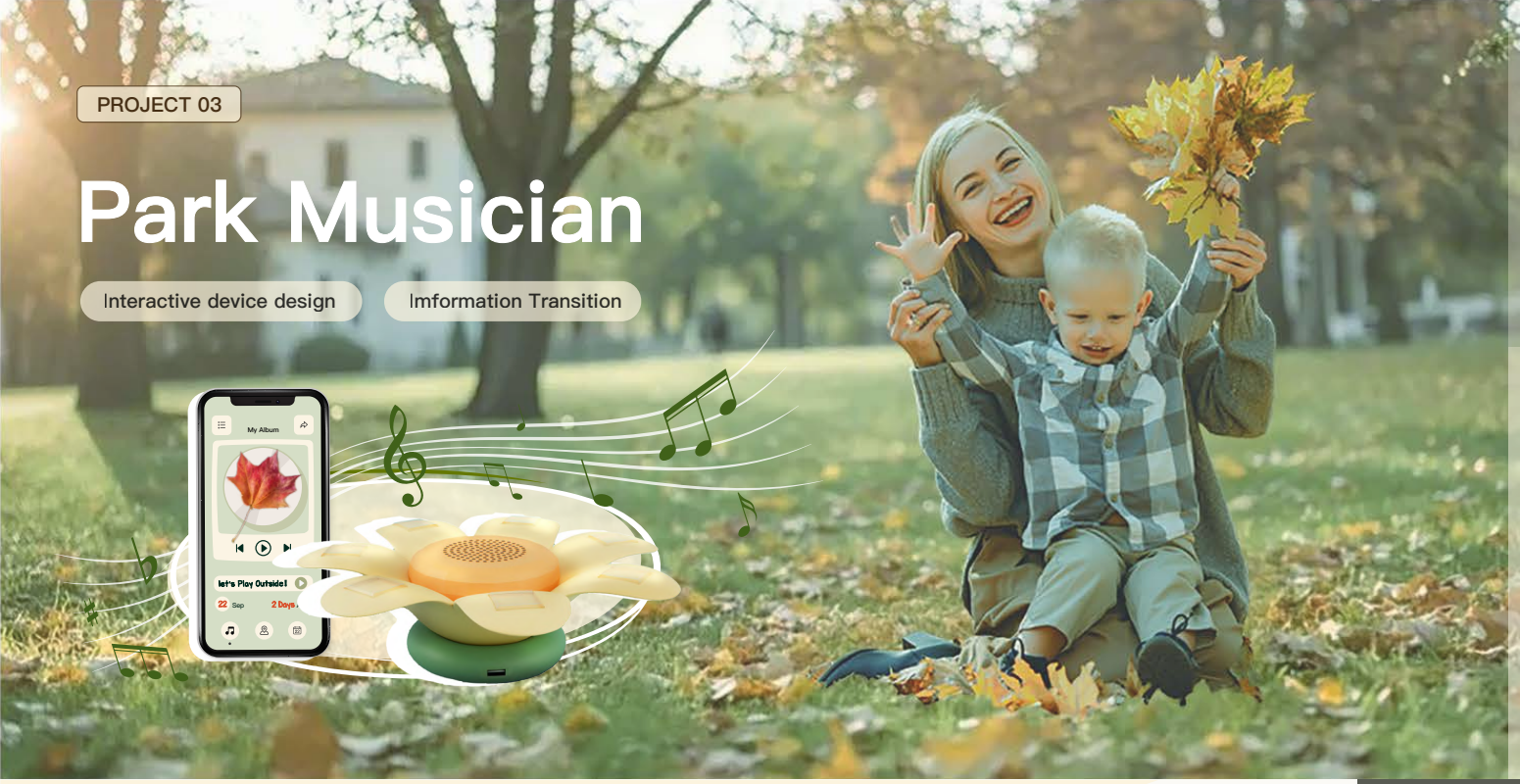
"I hope the pillow can give some **more physical feedback**, such as simulating the squeezing sensation that occurs when hugging, etc., to be able to make the experience of hugging simulation feel better"

PROJECT 03

Park Musician

Interactive device design

Imformation Transition



Description

A musical entertainment device that can be played in parks and other outdoor places, providing children with a cre–ative way of entertainment and encouraging them to get close to nature after school.

Reference

[1] Polo, A., Sevillano, X. Musical Vision: an interactive bio–inspired sonification tool to convert images into music. J Multimodal User Interfaces 13, 231–243 (2019).

[2] Y. Kato and S. Kurabayashi, "A Cross–Media Music Retrieval System by Converting Color Changes into Tonal Changes," 2014 IEEE 15th International Conference on Mobile Data Man–agement, Brisbane, QLD, Australia, 2014, pp. 349–352.

[3] Pridmore, R. (1992). Music and color: Relations in the psychophysical perspective. Color Research & Application, 17(1), 57–61.

[4] Chawla, L. (2015). Benefits of Nature Contact for Children. Journal of Planning Literature, 30(4), 433–452.

[5] Vong, K. I. P., Mak, C. K. M., Leung, S. O., & Chang, S. H. (2020). Age as the Most Promi–nent Predictor of Young Children's Creativity Performance and Challenges at Critical Turning Points Early in Life. Creativity Research Journal, 32(2), 192–197.

Background

- **In the past**, most of children's activities were **outdoors, playing in nature**, with face–to–face contact with people. **In the age of the Internet**, rapid urbanisation and anxious educational environments have inevitably accelerated the severance of contemporary children from nature. Most children's after–school time is **taken up by extracurricular studies or staying at home** playing with mobile phones and surfing the Internet, **lacking real contact with the outside world and nature, as well as colourful outdoor activities.**

01 Children's after–school hours are occupied



Children spend much of their after–school time in study and interest classes and do not have sufficient time for extracurricular activities.



02 Status of children's park activities

The childhood that children should have grown up together with plants was occupied by a single amusement equipment.



03 Children's addiction to electronic devices

Due to technological advancements, such as – increasing screen time and the use of social media, technology is driving kids inside.



04 Social Research:

- Parents generally want their children to be away from **mobile phone** and more exposed to the **outdoor environment**
- Most parents do not know how to guide their children to be close to nature and mainly focus on indoor educational envi–ronments

INSIGHT

- **Reasons for children's reduced time for outdoor activities**: Lack of time for extracurricular activities, and even when they have time, they choose to play video games at home as a means of relaxation.
- **The current state of children's outdoor activities in parks**: Children lack a form of recreation and relaxation that encour–ages them to go outdoors.

Interview

In order to learn more about interactions with nature and participation in park activities, I selected four respondents of different ages to survey them about their experiences related to childhood.

What do you do after school?
Do you like to go to the park?
What do you usually do when you go to the park?
What difficulties have you encountered when trying to get in touch with nature?



When I was a child, my heavy school workload **limited my exposure to nature**.
Although exposure to nature (e.g. admiring the colours of leaves) made me feel relaxed, the process sometimes seemed **boring**, and thus I **did not explore it more deeply**.

Interviewee 1
9 years old
primary school student



Because I usually have a lot of home–work, I **don't have enough time** to play in nature.
My parents take me to the park very rarely and **they expect me to study whenever I have time**.

Interviewee 2
20 years old
College student



During my childhood, there was little pres–sure from school, and I **often spent time in parks and outdoors** for activities and play.

As a child, I was **exposed to various plants** through school activities, which made me **more sensitive and interested in colours and sounds** of nature.

Interviewee 3
Mother of
a 7–year–old child

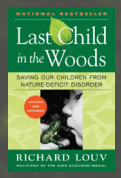


My child is usually usually working on his homework and participating in the extracurric–ular activities I have organised for him.

He usually loves to play video games and watch cartoons, and **I would prefer to get him outside when he finish his homework**.

Interviewee 4
34 years old
Businessman

Research



01 REFERENCE

"Nature deficit disorder"is a phenomenon proposed by American author Richard Louv in his 2005 bestseller —**"The Last Child in the Woods"**, and refers generally to the phenomenon of children who grow up in cities completely detached from their natural environment.

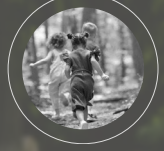


02 SYMPTOMS INCLUDE

Possible lack of attention and concentration,lower emotional well-being, behavioural disorders, addiction to electronics,video games, and many more



NATURE DEFICIT DISORDER



03 DESCRIPTION

Lack of exposure,contact and interaction with the natural environment and its elements such as plants,animals



04 IMPORTANCE

Essential especially in the years of a child's development

RESULTS



Positive

"Nature" is the best place for children to explore and learn. In the outdoor natural environment, children's psychological needs of exploration and creation can be met by contacting different natural elements.



Negative

These include lack of concentration, reduced physical fitness and observation, weakened emotional control, loneliness and electronics dependency. Some children even seem overwhelmed in natural environments instead, losing their instinct to be close to nature, which can lead to a host of health problems.

01 Decrease in children's participation in outdoor activities

Nationwide, **68.12%** of children spend less than one hour outdoors each day, and **11.27%** spend almost **0** time outdoors each day.

Only **15.34%** of children spend more than 1.5 hours a day outdoors. And **18.61%** of children spend more than **60 minutes a day** watching television, surfing the Internet and playing various electronic game products.

68% less than 1h outdoors



02 Outdoor time changes with the times

Three out of four adults played outdoors more often than indoors when they were young,compared to **only one in ten** children today.



3/4past

1/10now

HISTORY

NATURE

CREATIVITY

PARENTS

03 Age-related development of children's creativity

The age at which children's creativity develops at a rapid pace is usually around **5-9 years of age**, they are more likely to receive creative education (music, drawing, etc.) between the ages of 5 and 9, which is considered a **critical period for creativity development.**

However, this characteristic is often **overlooked and unappreciated by parents** at this age, and children's creativity is not well developed.

5-9age
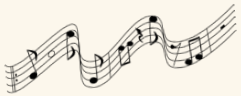


04 Parents' expectations of their children's natural education

85.18% of parents said that they **had 'no concerns' about exposing their children to nature**, while only **3.20%** believed that 'being close to nature delays their children's study time and affects their grades'.

Parents generally agreed that their children were **more interested in nature knowledge** than in other types, with a high percentage of **86.88%**.



Brainstorm



02

The process of **leaf wilting** can produce rich colour changes, through the colour of the light and dark, saturation elements to reflect the transformation of plant life force.

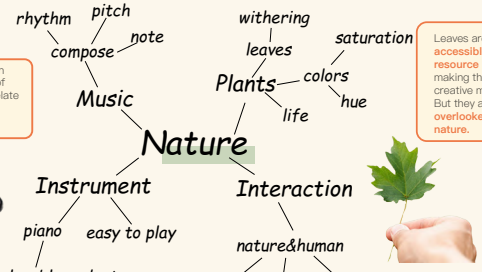


03

Leaves are the **most accessible natural resource** in the outdoors , making them suitable as a creative material.
But they are **also an easily overlooked element of nature.**

01

Extracting information about the attributes of **music**, trying to correlate and **convert them to colours.**





04

Designing an entertainment device that combines sound and nature to **attract children to use it.**

05

Provide a fun and educational way to **draw children back into the outdoors**, guiding them to observe the changing colours of leaves.

Summary

Designing a playable entertainment device, using leaves from nature as materials, encouraging children to go outdoors, extracting the colours of the leaves in the form of music and colours, and allowing children to create their own musical works in the process of free exploration, while improving their sensory perception, observation skills and creativity.

Design Concept

What?

Playable gadget + *Music & Colour Transitions* + *Leaves*





= *Fun Experience*
Interaction with nature
Creative stimulation

Who?



- **Children** at a critical time in their creative development
- **Children** who are under pressure from school and are reluctant to go outdoors for activities
- **Parents** who don't know how to guide their children to nature



Why?

Leaves
Rich in colour and changing with the seasons



Piano
The piano is the most dominant musical instrument and has a regular composition of keys.



Musical scales
The seven scales are the basic elements of music that everyone is familiar with, and children can easily understand them.



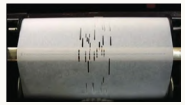
Technical Support

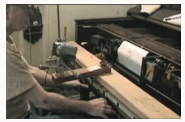
Inspiration

--Extracting natural elements to form music



Transform

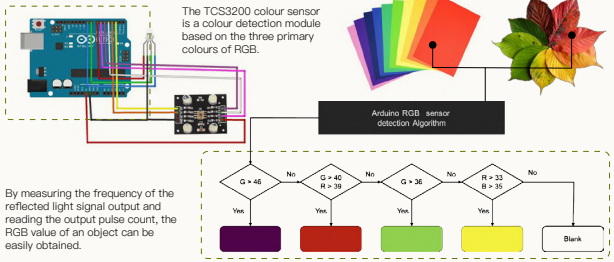




The white bark of the birch tree and the code-like black lines and stripes on it have a similarity to the perforations used to mark the notes on an automatic piano scroll.

Following the stripes of the birch bark, the designers laser cut the paper piano scrolls so that the sound of the birch tree can be heard on the automatic piano.

Arduino Color Recognition



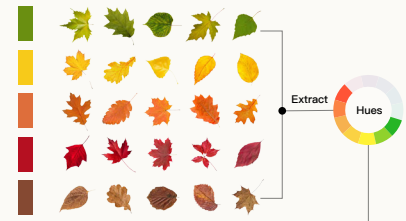
The TCS3200 colour sensor is a colour detection module based on the three primary colours of RGB.

By measuring the frequency of the reflected light signal output and reading the output pulse count, the RGB value of an object can be easily obtained.

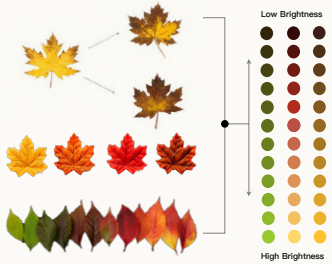
Imformation Transformation

1.Colour extraction

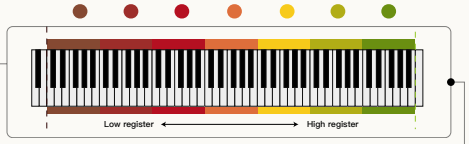
(1) Select the more common hues in the leaves and summarise a few representative colours that have a high saturation.



(2) Based on the colour change of the wilting process of different coloured leaves, creating a color gradient for each colour.



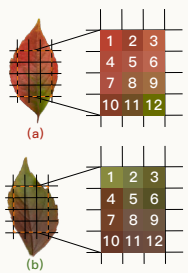
2.Colour–to–music transition

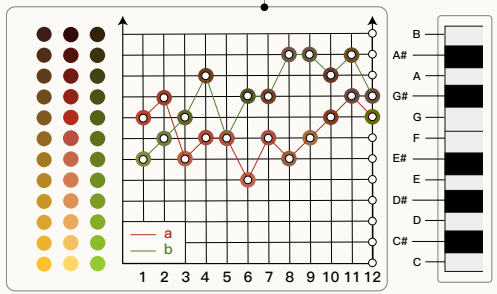


(3) The piano keyboard is divided into 7 units based on the 7 scales, and each unit corresponds to a different colour.

(4) Finally the colours are divided according to brightness based on the 12 black and white keys of each piano key cell, which correspond to the colours one by one.

- The lower scale on the left side of the piano corresponds to the colour of wilting, while the higher on the right side corresponds to the colour of new leaves



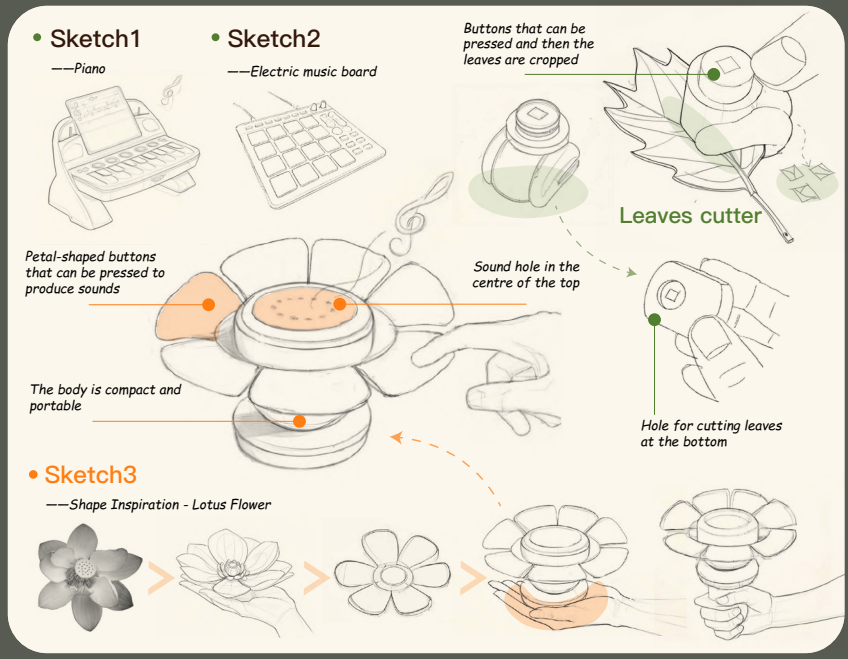


(5) Taking two more colourful leaves as an example, the notes formed according to the coordinates form a specific melody: the richer the colour of the leaves chosen, the richer the music generated.

(6)
The corresponding scale, as shown in the leaf in (a) above, is GG#E#FFEFE#FGG#G
Playing on the piano is shown on the right.



Sketch



Display



Body
- Flower shapes and colours
- Portable hand size

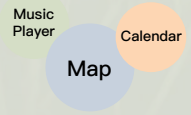
Sound Hole

Buttons
- Press different buttons to make different sounds.

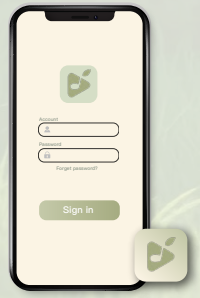
Glass Lid
- Ability to put in leaves and identify colours

Functions

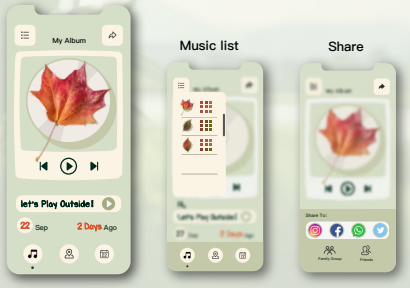
- This is an app to be used with the device, with simple functions, mainly for recording compositions, playing music, park guides and reminders.



Welcome Page & Logo

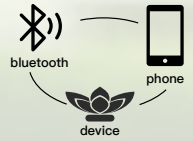


Main page

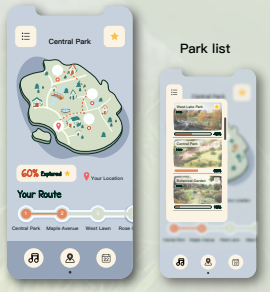


- The interface for playing music uses the leaves collected by the user as the cover of the music.
- History of compositions can be browsed through the music list, and music can be shared on social platforms, with family or friends

Connection



Guide map



The navigation map interface allows the user to browse the park map, and recommends nearby parks for the user to visit;

It also displays the user's current location and the level of exploration in the corresponding park.

Calendar



The calendar interface records the date of the child's outing and provides reminders to parents;

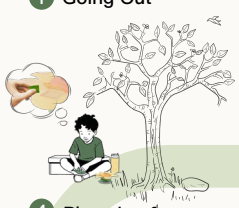
It also records the child's leaf collection and music creation records in the corresponding park in the form of photo albums.

Storyboard



1 Going Out

2 Select Park



4 Place Leaf



3 Collect Leaves



5 The Device Makes A Sound



6 Listen together

Feedback

Feelings

- "It's a great way to keep my kids relaxed and entertained."
- "It enhances the interaction and intimacy between me and my children."
- "It gets my kid outside more and enhances his physical and mental health."

Suggestions

About the device:

- "I want my kids to be able to customise the look of the device according to their pref–erences"
- "I would like the device to be more instructive, such as using a few examples to guide the child's creativity"

About the app:

- "I would like the app to help my child recognise some of the plants in the park."

Future Design

More Nature Source

- Consider adding other natural elements that can be transformed into information. By adding more natural elements, help children to better interact with nature.



Leaves Cutter Design

- The design of a special leaf cutter may be considered at a later stage.



PROJECT 04

Access to the Internet

Interactive Device | Visual Interaction



Description

This is an interactive media installation that visually simulates the experience of people as they **interact with the Internet and information**, allowing the viewer to reflect on their own **relationship with the Internet**, exploring the **sense of acceleration, pressure or immersion** that is triggered by exposure to the Internet.

BACKGROUND

The State of the Internet in the Information Age

In the age of the Internet, people are hit by a massive flood of information, and at the same time, the information they receive is complicated and fragmented, and it is difficult to distinguish between the true and the false.

State of the news media

- News media fabricate and distort facts for the purpose of gaining attention, creating public opinion, etc., often use exaggerated and emotional headlines and content to stir up people's emotions and gain their trust.

Lack of governance in the cyber environment

- Poor behaviour and online violence are more common on the Internet

FAKE NEWS

62%

- **Unreliable Information**

The Internet is full of misinformation, and nearly 62 per cent of the information on the internet is unreliable

Rapid development of the Internet

- 78% Internet users as a percentage of total population
- 92% Short video users as a proportion of Internet users
- 89% Percentage of active people on new media platforms

- **Numerous online media platforms**

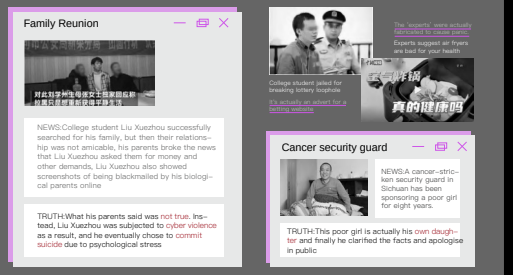
YouTube

INTERVIEW

In the interview session, I designed a special process: firstly, I showed the interviewees four fake news stories without informing them of the truth of the contents; after asking them how they felt when they first read these news stories, I informed them of the truth, and then I asked them some questions once again, comparing their attitudes and emotional changes before and after.

STEP1

Telling the news, getting the tester to understand the information, and giving feedback on their feelings



STEP2

Tell the follow-up of the news event, then ask and observe the tester's reactions

How did you feel when you knew the news were fake?

- Have you ever been sceptical about the content?
- Why do these (certain) news reports seem credible to you?
- Have you considered that these news may have a big impact on the people involved? (such as the Liu Xuezhou case)
- What was your attitude and action when you saw similar news before?



NO.1 Age: 22 Student

"I feel that I am exposed to mixed messages on the Internet and I often **cannot distinguish between the truth and falsehood** of them"

"People may be easily guided by false information on the Internet, which may have some negative consequences for the person concerned"



NO.2 Age: 21 Student

"I feel that I am usually exposed to too much similar news content, watching the news is just a form of entertainment and **I don't care too much about the content**"

"Nowadays the news is treated as a kind of entertainment, I think it's fine to just read it casually"



NO.3 Age: 35 Housewife

"I will feel that some of the events can arouse some emotions in me, but I may **forget them** after a glance, and they will **not have many effects**."

"It's hard not to be suspicious of the increasing amount of falsehood in the news nowadays, but some emotionally provocative content can easily gain people's sympathy and trust."



NO.4 Age: 41 Businessman

"I think these news are so common on the internet that I've **become accustomed** to them."

"With the modern overload of information, people are becoming accustomed and numb to it"

SUMMARY

Widespread scepticism

The mixing of true and false information leads to a decline in the credibility of the news media



Susceptibility to information

The public is easily guided by the content of the news and even participate in public opinion and cyber violence



Information Overload

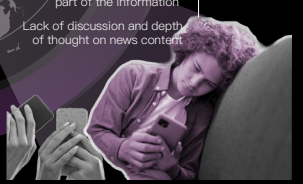
People receive mixed messages and gradually lose interest in exploring the content of the news



People's numbness

Quick overview of information: people always remember only part of the information

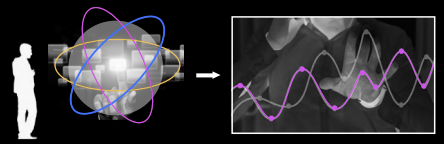
Lack of discussion and depth of thought on news content



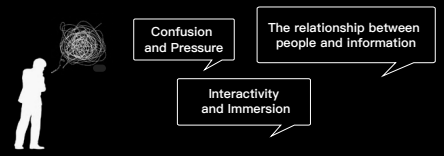
CONCEPT



The device operates faster as people approach it, reflecting the significant increase in the **frequency and complexity of information transfer** when people interact with the Internet.

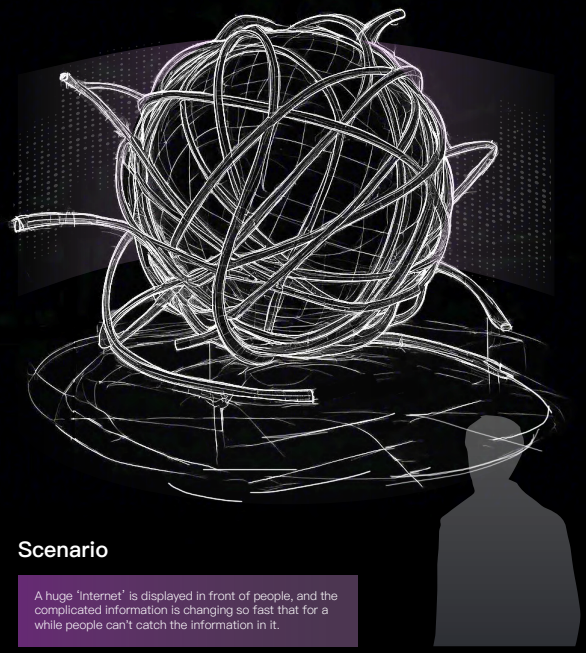


The **non-linear nature** of the Internet is vividly represented through the flow of coloured liquids, exemplifying its unpredictable and ever-changing nature.



Through the device, the audience is prompted to reflect on **their own relationship with the Internet**, exploring the sense of **acceleration, pressure or immersion** that is triggered by exposure to the Internet.

SKETCH

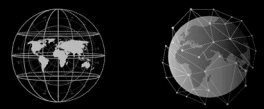


Scenario

A huge 'Internet' is displayed in front of people, and the complicated information is changing so fast that for a while people can't catch the information in it.

TRANSFORMING

The "Shape" of the Internet



The Internet is like a huge invisible web that links people all over the world, and like **a huge 'net'** that affects people all over the world.

Dissemination of Information



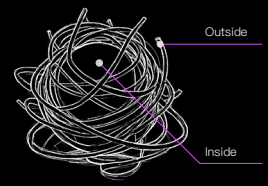
Information, like water flow, has the attributes of **speed and circulation**; at the same time, with the development of the Internet era, the network information is **gradually complicated**.

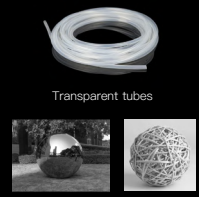
Colours of Information



In data visualisation, people use a variety of **saturated colours** to represent different data; when there is information overload, the effect presented is dazzling.

DETAILS





Stainless steel metal ball or Sepak Takraw

INTERACTION PROCESS



The device operates **slowly** when the viewer is far away from the device

The audience approaches the device and the surface of the device **reflects the audience's face**



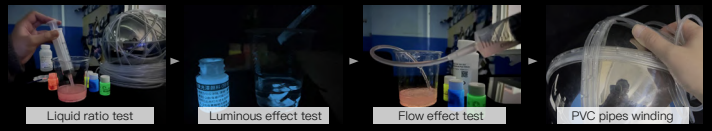
When the audience approaches, the liquid inside the device flows **rapidly**

Finally, the audience is **confused** in front of the device and **experiences the clutter of information**

PROTOTYPING & ITERATION

MATERIALS TEST





Mix pigment and glycerin (glitter and water) in **different ratios** and choose the ideal mixing ratio.

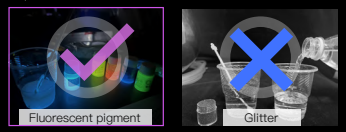
Inject the mixed liquid into the pvc tube **through a syringe** to simulate the liquid flow.

Wrap the pvc pipe around **two kinds of spheres** and observe the overall effect.

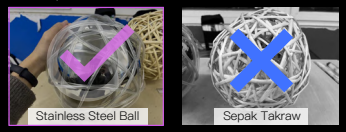
Try **random and braided** pvc pipe winding form, choose the best effect

SELECTION OF MATERIALS

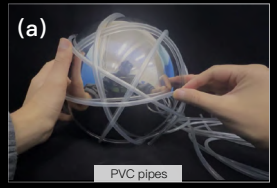
Liquid material

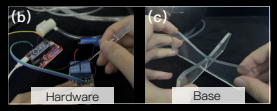


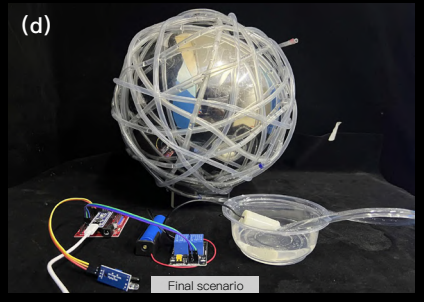
Centre sphere



SCENARIO CONSTRUCTION

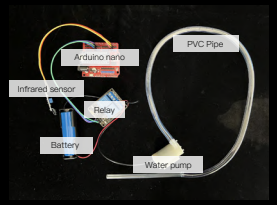


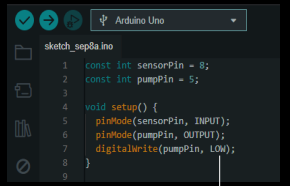




TESTING

ARDUINO & HARDWARE





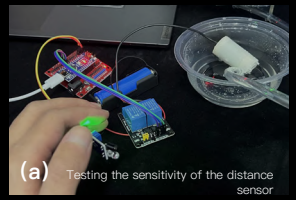
Set the initial state of the pump to 'slow'.

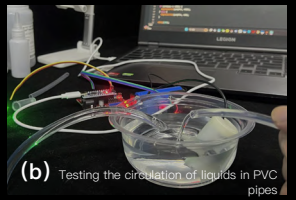
Receive distance sensor status

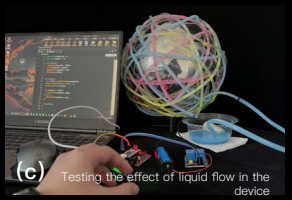


Switches to 'fast' when an object is detected.

DEVICE TEST

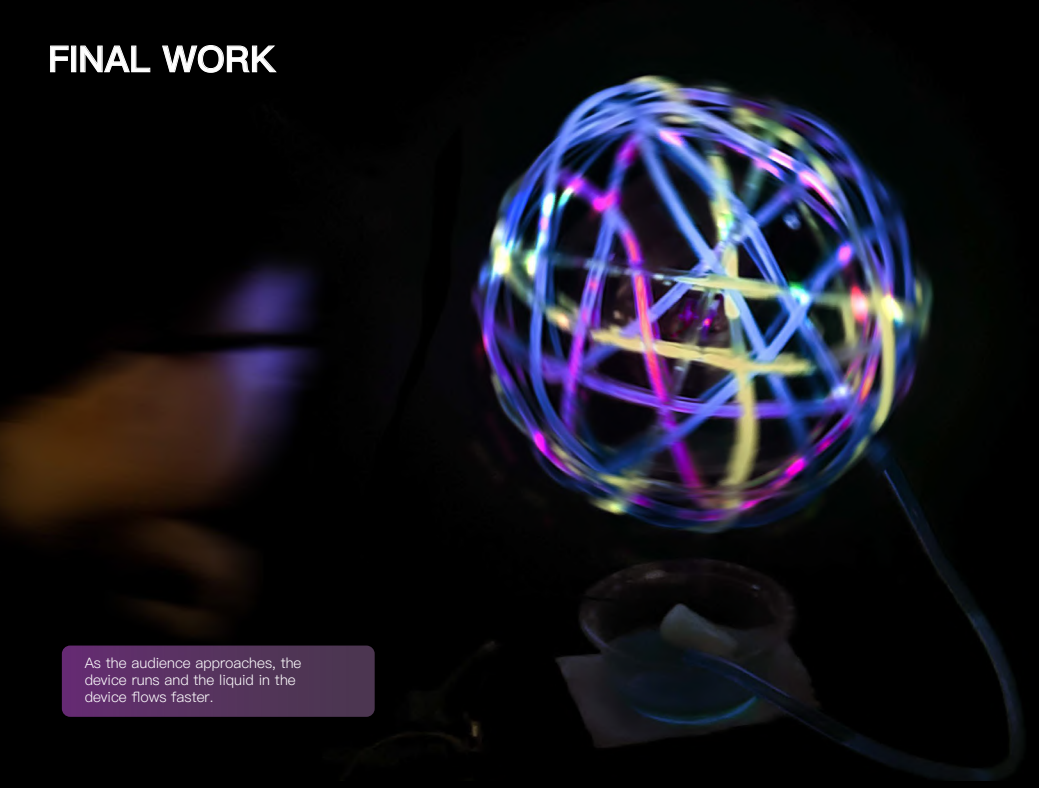




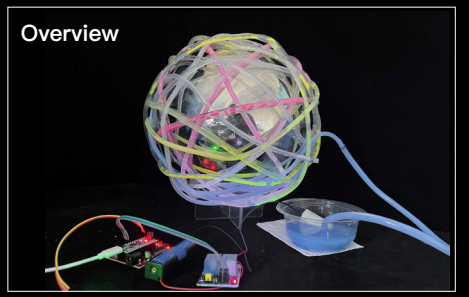




FINAL WORK



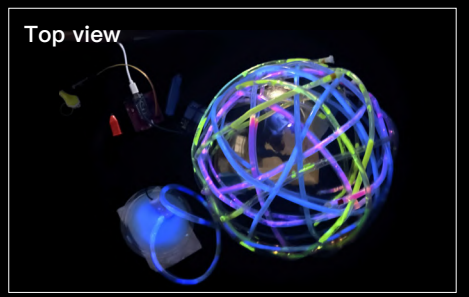
As the audience approaches, the device runs and the liquid in the device flows faster.



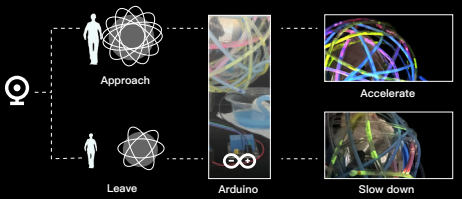
The state of the device under incandescent light, the colour of the liquid consists of the optical triad of red, yellow and blue



The state of the liquid as it circulates through the device after being illuminated with a luminous lamp



EXPERIENCE FLOW



THANKS FOR READING!

▼ Introduction video



https://youtu.be/JOMZWfM6FiI

▼ Previous works



https://www.xiaohongshu.com/user/profile/5f2d8f13000000000101d22d