

Nabi

Justice | Indispensable | Advocate

Made for you,
from the bottom of
our broken and healed hearts





Where did Nabi name come from?

"Nabi" means butterfly and this is what Koreans commonly call stray cats they encounter.

I created this project alongside people who survived child abuse and work hard to combat child abuse for a better future for children.

We just want to create and contribute this project to those who feel like they don't have a family or home.

This project is made for you.
From the bottom of our broken and healed hearts.



- Brief
- Topic of Interest
- Problem Space
- Secondary Research
- Primary Research
- Affinitization & Insights
- HMW
- 5 Whys
- System Concept Statement
- User Persona and User Journey
- Physical Prototype
- Technology
- App Design
- Business Concept Paragraph and Marketplace

Project Brief

Create an experimental piece of technology (with and hardware).

Use research methodologies to identify a social/cultural/design trend, technology options, market space, and possible new product. Focus on providing a quality, and novel user experience.

Topic of Interest

Urgent child care for abused children.

There are no current self-protection systems for abused children.

Problem Statement

Child abuse cases are constantly rising and children are constantly getting injured or dying because they could not make the report or have clear evidence to prove the abuse.

Secondary Research

Datas about current Child Abuse Issue

Why are children being injured and dying?

Possible solution to prevent child abuse and protect children

User Research and brainstorming

Device features

Materials

Data about current Child Abuse Issues

It's estimated that at least 1 in 7 children in the US has experienced child abuse.

Boys and girls experience similar rates of childhood abuse (48.6% and 51% respectively).

The United States has one of the worst records among industrialized nations - losing on average between 4 to 7 children every day to child abuse and neglect.*

Adult survivors of childhood abuse are more likely to experience mental health difficulties, including depression, anxiety, bipolar disorder, PTSD, eating disorders, and substance use disorders.

78% Batterers typically abuse the child again and again.

Why are children being injured and dying?

Due to Physical, Verbal, Mental, Neglect Abuse.

Inability to make a report when abuse happens or gets abused.

Lack of evidence to get suitable help and be investigated.

No frequent visits and monitoring from the advocacy center

Possible solution to prevent child abuse and protect children

Platform and Device that could report as soon as the abuse occurs.

The system that can collect definite evidence.

Monitor feature that alerts government or CPS about the child abuse for affectively

User Research and brainstorming



Device features

1. Temperature detector (detects Decreases in Resting Metabolic Rate)
2. AI Function - Interact and interpret humans/ find patterns of the parent and children - have robot predict the possible scenario.
3. Voice detector- Record and collect evidence.
4. Muscle detector - EMG Sensor.
5. Heart rate / Oxygen level detector (determine if the child is hyperventilating),
6. Blood pressure detector - Chronic starvation may lower blood pressure levels as a child's body is completely devoid of food and water.
7. Color change function
8. Battery charging

Materials

A new material made by the Chemical Research Institute in Korea.

A New material that has two contradictory properties at the same time, which is hard, tough, and has good self-healing capabilities.

When external friction or shock occurs, the molecular bonds of the material quickly become solid, protecting itself from impact, and recovering damage by returning to a soft state free of molecular movement after the impact.

Inflammation tests with mice also show low toxicity.

Material is made in biodegradable polyurethane - fish oil extracted from fish heads, bones, intestines, and shells.

Salmon farming has become a major industry leaving many heads, bones, shells, and intestines as waste.

Primary Research

Survey

Interview

Contextual Inquires

Diary Studies

Data Analysis with Affinitization

Main Insights

How Might We?

5 Whys

Survey

Total of 59 Surveys

Posted on Child Abuse Counseling Reddit and Facebook page

Savannah College of Art and Design Students.

Advocacy Center Workers

Government Workers

Child Abuse NGO Workers

Interview

- 1 Journalist who was with the Fernandez trial
- 2 Lawyer/prosecutors
- 3 Government Executives
- 4 Medical Profession
- 6 Parents
- 10 Social Workers
- 8 College Students
- 59 Children

Thanks to

Savannah College of Art and Design and CS3 (Bee Well)

Child Advocacy Center (CASA)

Coastal Children's Advocacy Center

Division of Family and Children Services

Child Protective Services

Success for Children and Families, Inc.

Babies Can't Wait Assessment

Child Protection Center | Children's Healthcare of Atlanta

The Blue Ribbon Commission for Child Protection

Los Angeles Times

Samsung Medical Center

Asan Medical Center

Memorial Pediatrics Hospital

Deputy District Attorney

Morgan & Morgan Law Firm

For product development specifically

Contextual Inquiries

Diary Studies

01 Memorial Pediatrics Hospital

02 Babysitting

03 Costal Child Advocacy Center Therapy Sessions



Memorial Pediatrics Hospital

The Pediatrics center is for child patients age 0-18. Hospitals offer cardiac care, cancer care, trauma, pediatrics, high-risk obstetrics, and neonatology.

I tested what wearable tech they would wear in the hospital setting (their most vulnerable settings) and what wearable tech would comfort them when children are in vulnerable mode.



Babysitting - CASA

Volunteered as a babysitter for CASA (Court Appointed Special Advocates).

I tested what bracelets they would like to wear. Made and designed the bracelets together and asked them to wear them long as they could. Made bracelets with 5 children and all of them kept wearing them even after 3 weeks.



Costal Child Advocacy Center Therapy Sessions

Child Protective Services is aware of the family and its potential for abuse. The center pays attention to the physical and emotional condition of their child, and the child knows that someone cares.

I led the DIY bracelet art therapy session's outcome and the impact was on abused children and it affects their comfort and healing.

The Center for Safe and Healthy Children Art Therapy Class



Offers specialized forensic medical evaluations and interviews for suspected victims of child abuse and neglect. Offers forensic medical evaluation. with trained social and medical workers. The center also offers behavioral health assessments, diagnostic evaluations, and therapy.

I led the DIY bracelet art therapy session. They were comforted with the bracelet staying with them during the trial, and examination, and adjusting to new and different places when they were removed from their caregivers. Found the majority of them touching and looking at their DIY bracelet and seeking to be comforted by counting and touching the bracelet during forensic interviews.

What I found

For product development specifically

01

Children prefer to design their own color and design of the bracelet they will wear long term.

02

Out of all the wearable tech options, children preferred to have bracelets to be their comfort jewelry.

03

Children wear bracelets long term considering them as a buddy or charm.

What I found

from following interviews

01

Sharing medical information with the CPS and government workers who have been authorized for access to health information measured with biometric sensors is fine.

02

Children find the most comfort when they are under the protection of professionals (CPS) while living with their parents.

03

Children feel dressed when they are wearing pieces of jewelry and feel part of society when carrying technology (phones, pads, smartwatches).

04

Having a biometric sensor to log and observe stress and emotion levels is important.

Additional **Secondary Research** on bracelet

Wearing a piece of jewelry is a means of expressing our character.

Research shows that there is an increase in self-confidence when wearing jewelry.

Jewelry and objects that has protection functions have the power to heal and connect.

Jewelry transports us to other memories.

Customized bracelets connect children to other people.

Bracelet making and customizing DIY process heals and helps children advance intentions.

Additional **Research** on users of the bracelet

Why the bracelet is for the child, not the parents?

1. The common mistake social workers made was that they listened to and for the parents. We need to hear and empathize with the children's perspective of how the abuse was.

2. After interviewing 2 different parties (parents and children). The side that wanted to be heard and protected during the abuse was the children.

When abuse happens, parents went over multiple feelings (anger, regret, fear, excitement, the rush of adrenaline, etc) but children felt 2 things in common, fear and desire for someone to rescue.

Data Analysis with Affinitization

Total of 1678 Sticky notes

54 Categories

31 Insights created

5 Main Insights confirmed

Main Insights

There is a high turnover rate in the system of child advocacy center employment.

When abuse happens to children there is nothing that can be done to help the situation of abuse.

Most parents do not acknowledge that they are abusing their child/children and children do not acknowledge they are being abused.

The process of collecting evidence is very difficult and long and it delays the steps to keep the child safe and investigate the abuse case.

Once the child is abused, 92% of children go through long-term disabilities that affect their adulthood which creates a toxic cycle to their life and the community around them.

How Might We?

How might we save children when they are in a place or situation they cannot get help.

How might we save children from severe abuse happening at the moment.

How might we record the evidence more effectively.

How might we help children or abusers acknowledge the abuse.

How might we help the professionals investigate more efficiently

How might we break the chain of toxic cycle of child abuse.

5 Whys

Innocent children are dying due to child abuse

- No help system for child abuse during the abuse happening in private settings such as home.
- Abusers mostly do not acknowledge that they are abusing the child
- There is no second eye to monitor abuse and the child is unable to report the abuse and moved to a safer condition.
- Despite the continuous report of child abuse, due to a lack of evidence of the child abuse, the investigation could never be taken further or seriously.
- There is no system that oversees the private settings of child abuse.

Solution: Make a close monitoring system for abused children even in private settings to help log evidence, allow children to protect themselves, and help protectors (CPS or government) to secure the children in urgent abused situations.

System Concept Statement

User Persona | User Journey



Daniel Gomez



Location
New York, New York



Age
5



Housing
2 Bedroom Apartment



Abuse Case
Physical Abuse



Lives with
Mother and her boyfriend

Biography

Daniel is 5 years old boy living with his mother and her boyfriend who abuse him due to heavy use of alcohol. He's has been repeatedly reported for physical abuse case due to a broken arm and mesenteric hemorrhage. Daniel was mostly abused by his mother's boyfriend who works from home and spends most of the time with Daniel when his mother is not around. Daniel fears nd panics to be alone with the abuser. He feels unprotected and abandoned majority of time which affects his mental health.

Needs

- Monitored constantly in case of any physical abuse emergency
- Protected and cared by the advocacy center real-time
- Able to report the abuse as soon as he is exposed to dangerous situation
- Collect evidence of the abuse to use it in the court
- Build trust with adults and know that he is cared.

Pain points

Daniel is always stressed about his living environment and exposure to threat at all time. He wants to be protected by people who could help him in action. He is struggling and finding ways to report when the abuse happen due to lack of evidence and less exposure to outside of the house.





Daniel's Journey

- 5 year old, male.
- He lives with his mother's boyfriend who physically abuse him
- He is struggling to report when the abuse is happening and he fears to be exposed to abuse anytime.

<p>USER ACTIONS</p>	<p>Daniel came into a hospital due to a broken arm due to a physical abuse</p>	<p>Daniel is under the care of the advocay center and suggested to wear Withyou.</p>	<p>Daniel stays at home with his abuser and try his best to not be in abuser's sight and trigger the abuser</p>	<p>Daniel's mother and abuser gets into a fight and this triggers the abuser to abuse Daniel. Daniel senses the danger and his body responds to a threat.</p>	<p>The advocacy center and 911 arrives as Withyou made the report on behalf of Daniel. Daniel was able to evacuate to a safer care and avoid the abuse.</p>	<p>Daniel now enjoys safe and protected life with no stress as he is not in a helpless situation anymore.</p>
<p>USER EMOTIONS</p>						
<p>PAIN POINTS</p>	<p>As 5 year old , Daniel is struggling to make a report when the abuse is happening.</p>	<p>He feels it is unfair that this situation is happening to him and feel like the device won't help much.</p>	<p>Daniel does not know what to do or know what is the best way to behave as the abuser could abuse him at any moment.</p>	<p>Daniel is feeling depressed as he knows he will soon be in great threat and danger.</p>	<p>Daniel is feeling hopeful as he sees all the features and functions of Withyou that would solve diverse problems that he has been facing.</p>	<p>Daniel feels secured and relieve that help is aaround him constantly. He feels assured that found solution for his problem and stuggles though Withyou.</p>
<p>TOUCH POINTS</p>	<p>Withyou helps Daniel by monitoring his atmosphere, his body changes through AI system that oversees his situation and make the report real-time.</p>	<p>Withyou will constantly track and monitor Daniel and support him by calling for help as soon as the abuse happen.</p>	<p>Withyou will change its' color to let the abuser know that he is abusing the child as he abuse Daniel unconsciously.</p>	<p>Withyou will recognize Daniel's body's condition swift and voice recognition feature will hear the fight. AI feature will decide to start recording the situation.</p>	<p>Withyou's AI will remember this case and put it in the system to use it for next abuse case to protect Daniel more effectively and respond dilligently.</p>	<p>Withyou bring comfort and relief to Daniel and earn trust from the user, 911, govenment, and advocay center.</p>

Prototype

Design Choices (Moodboard, Concept)

Low-fi

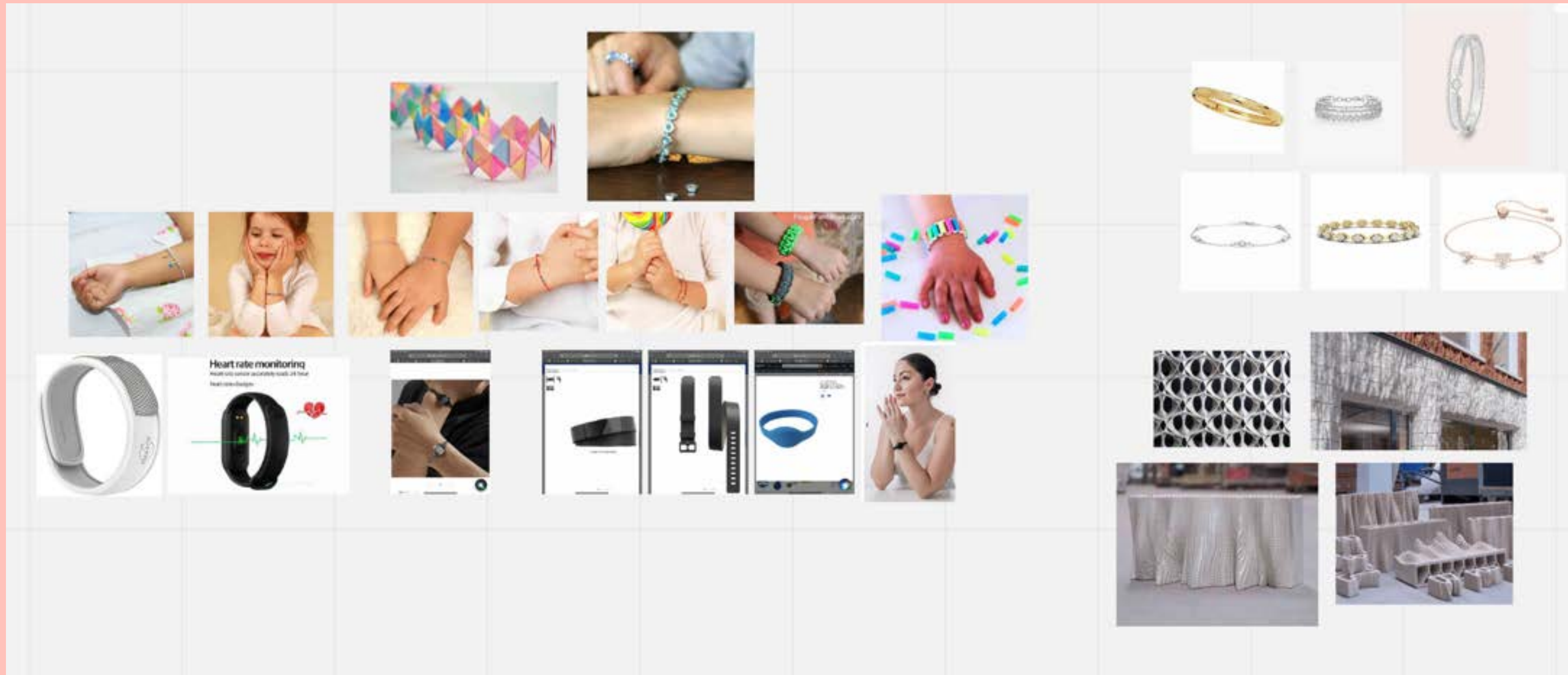
Mid-fi

Prototype Render

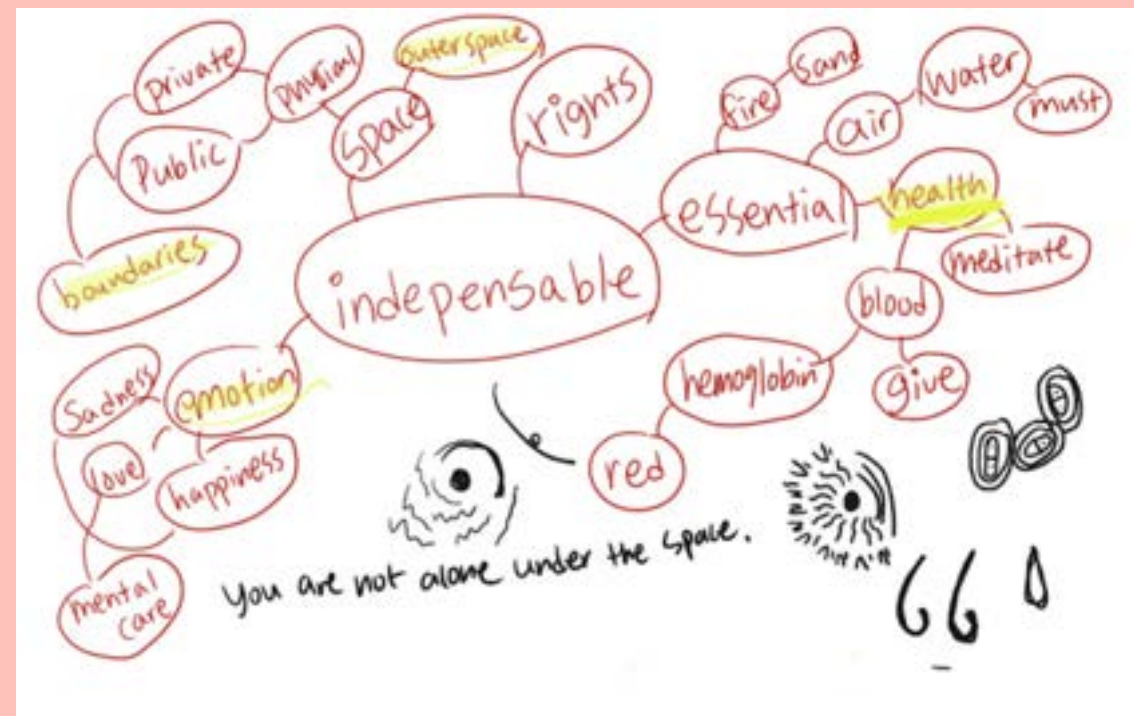
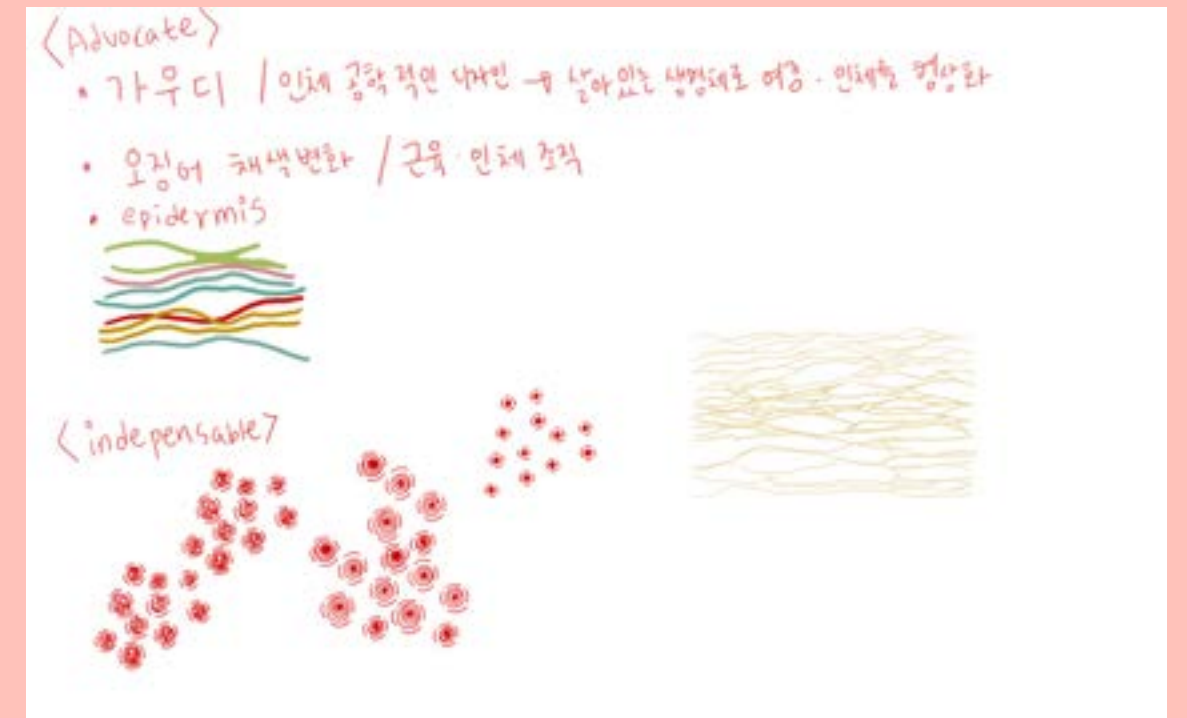
Charms

Physical Prototype

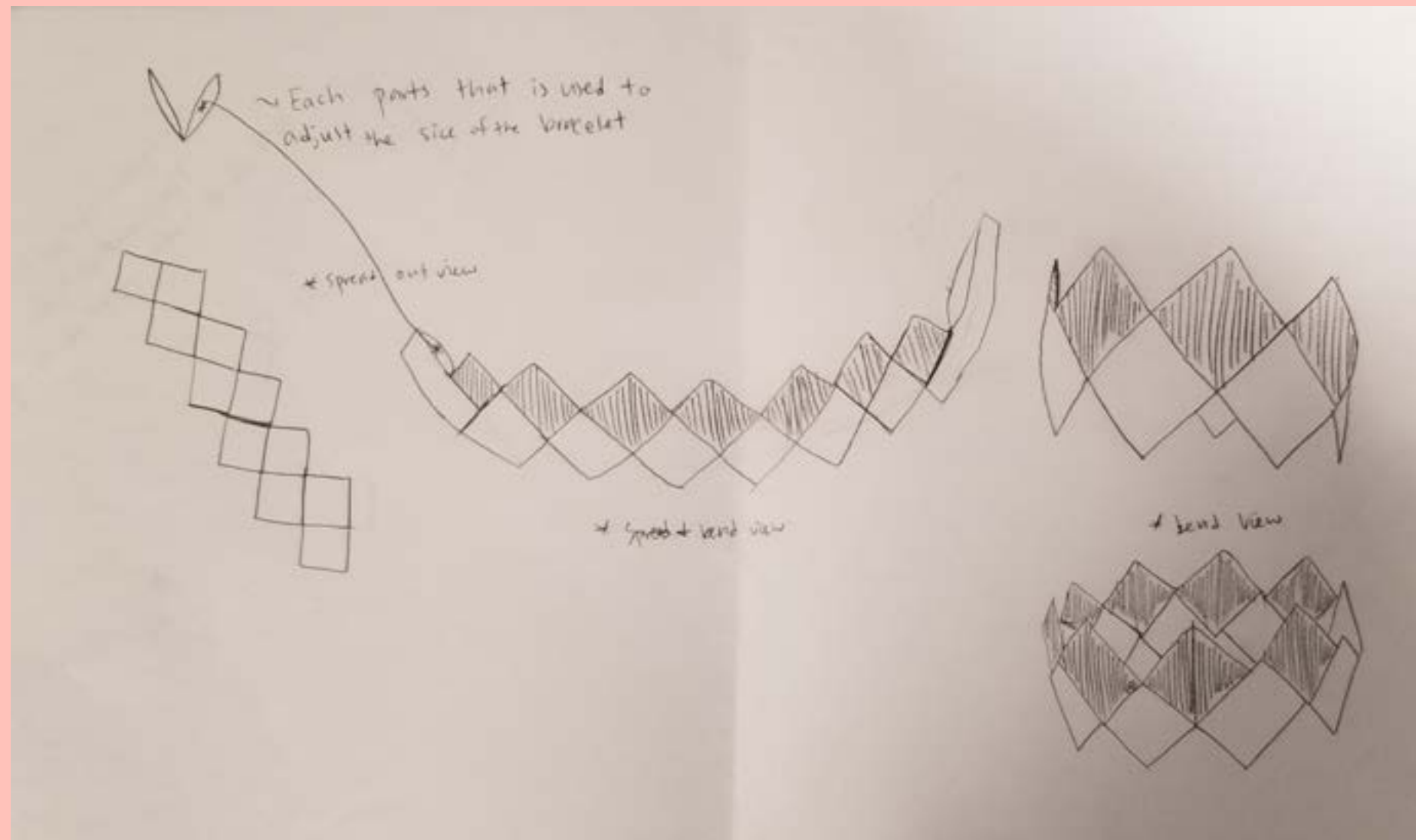
Moodboard



Concept



Lo-fi



Mid-fi

EVA foam



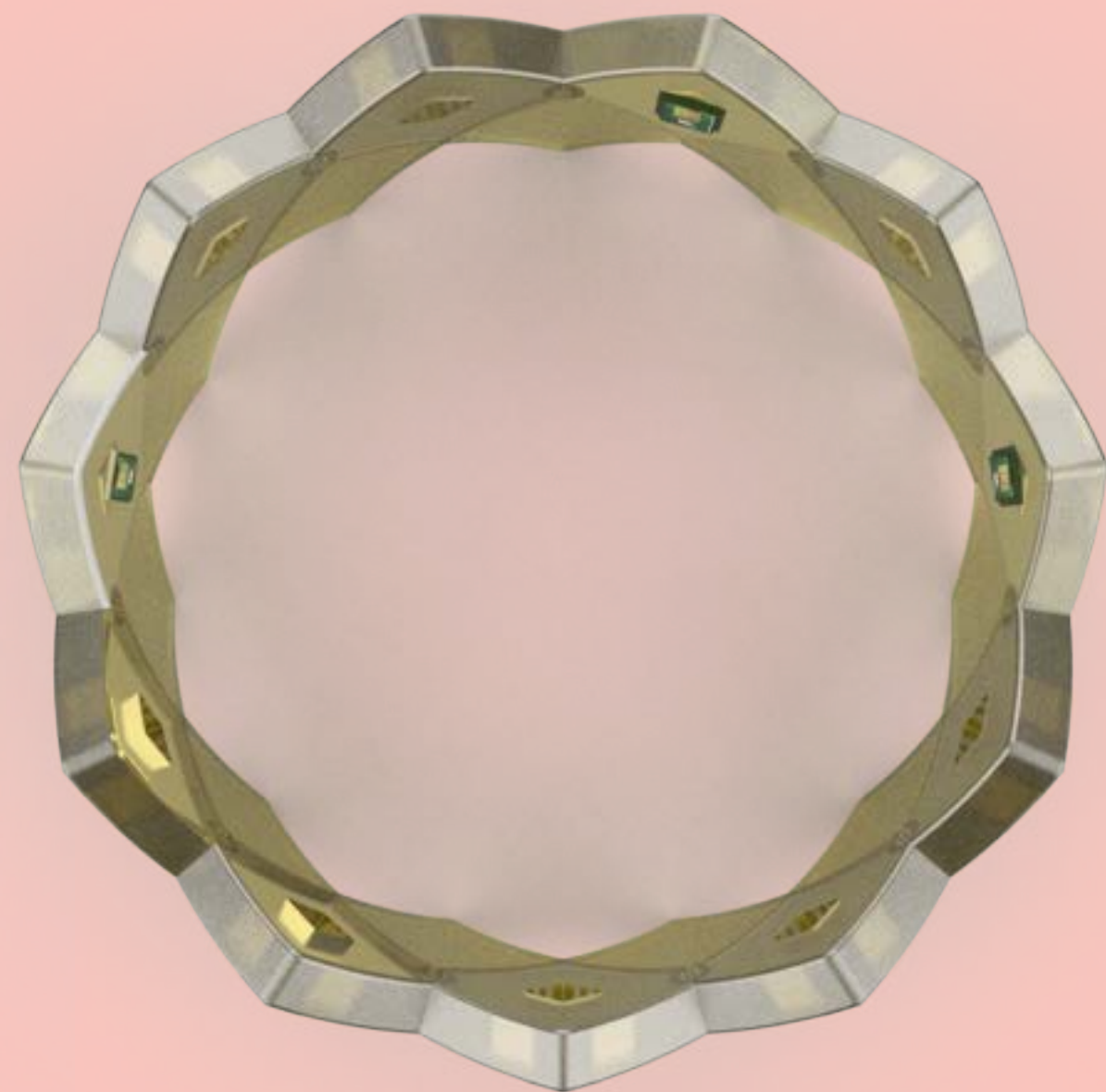
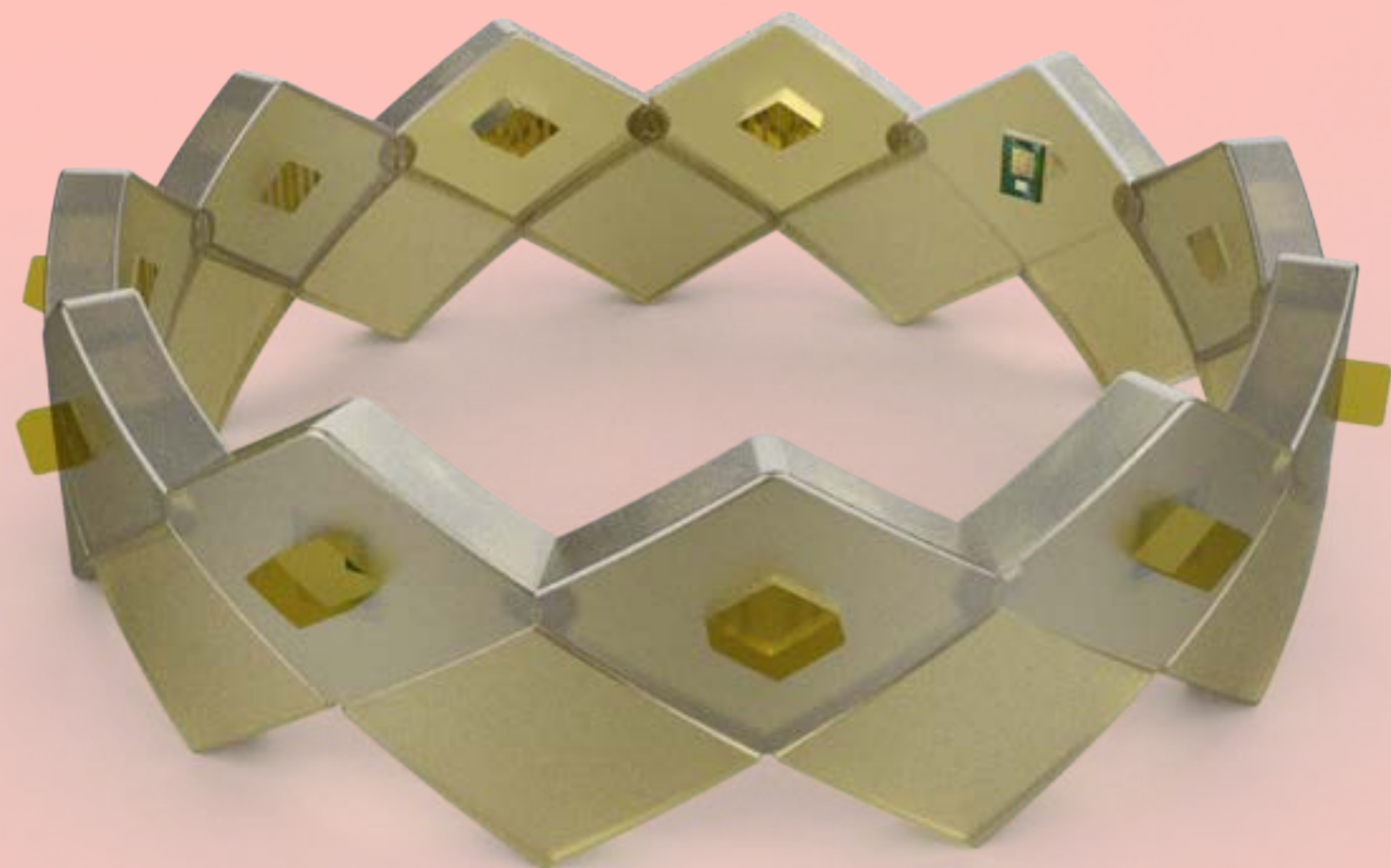
Leather



Paper



Hi-fi Render - Part 1

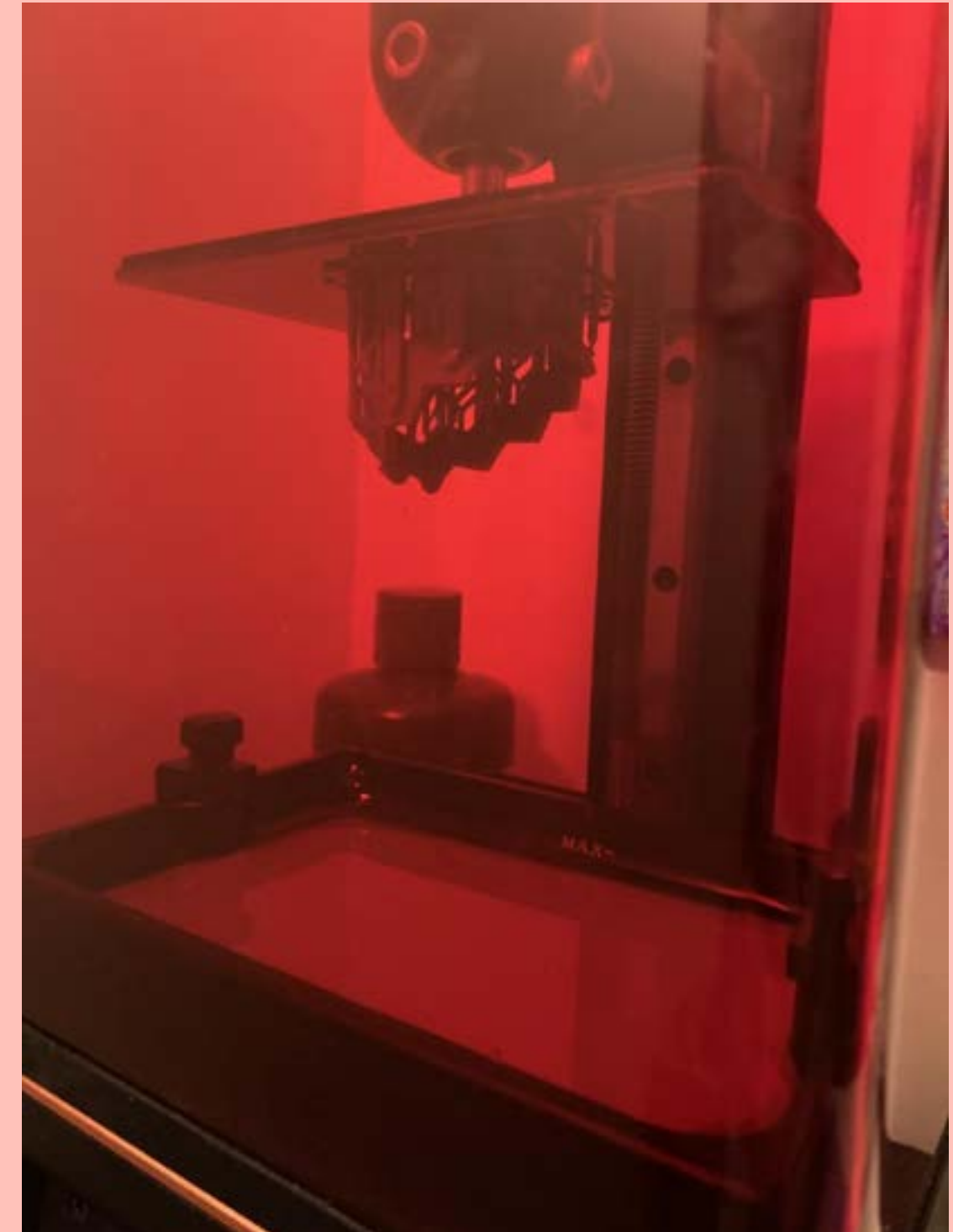
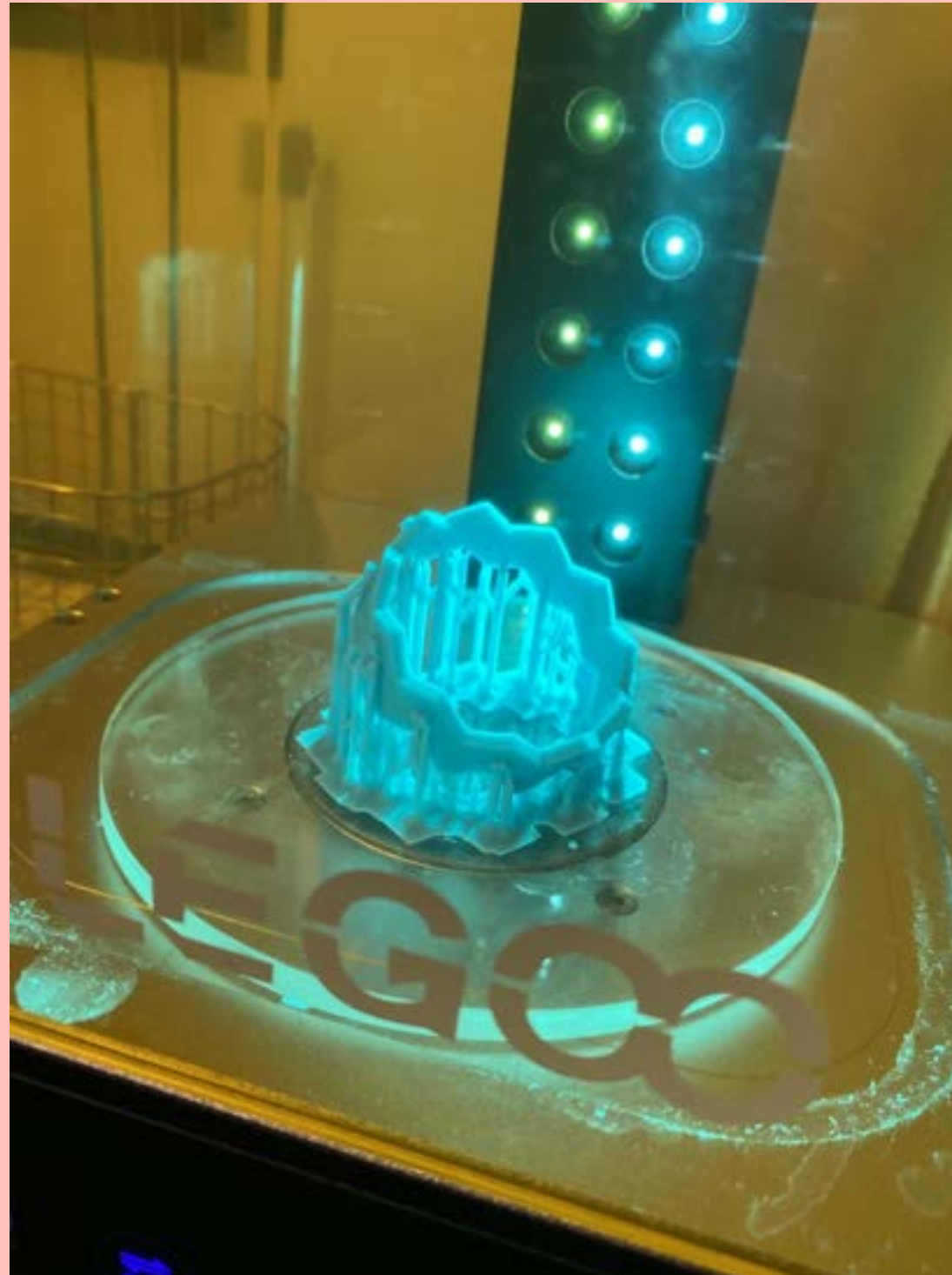


Physical Prototype



Physical Prototype

Process of making



Result: Prototype on a kids

75% return rate. Children continued to wear the prototype.

Rest 25% were cases where the prototype broke.

Children came back with prototype colored or stickers attached (customization).

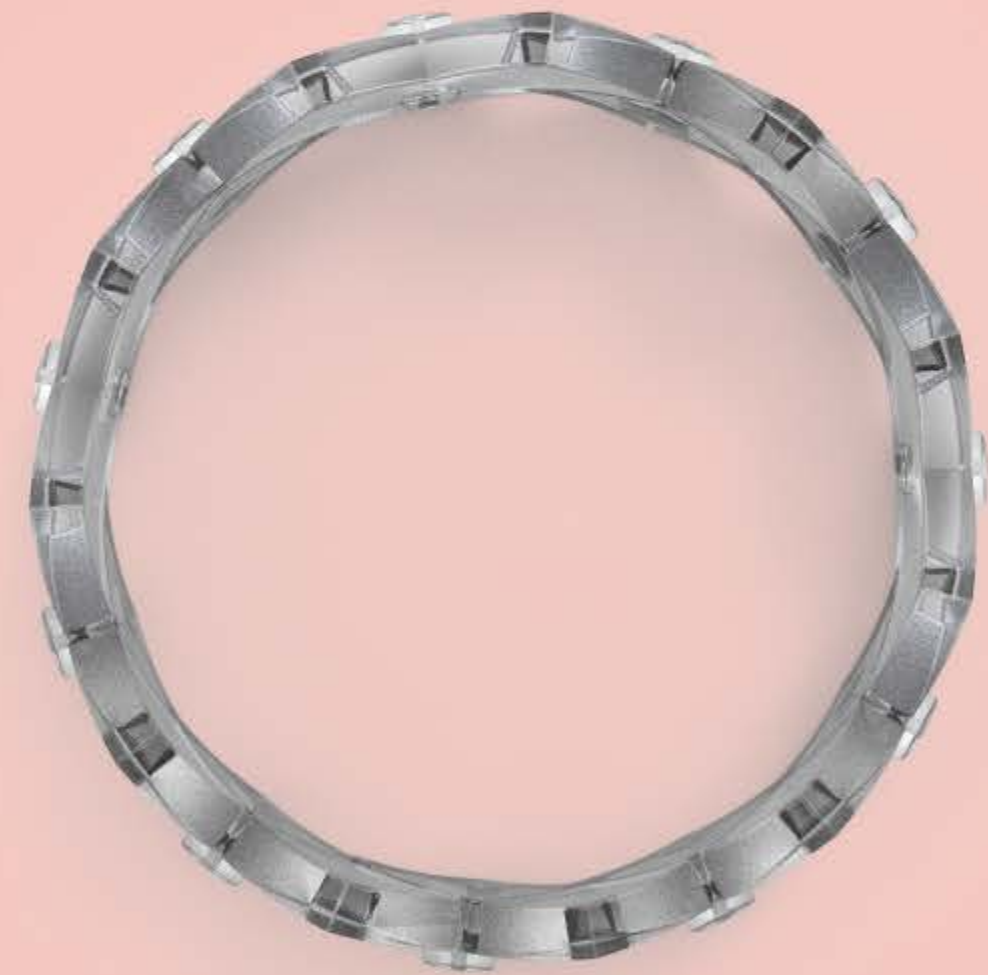
Children tend to wash the bracelet when they wash their hands

They unconsciously squeeze, scratch, and touch the bracelet.

Mostly seen while they were in anxious or feared situations (in the court, counseling sessions, and interviews).

I introduce you

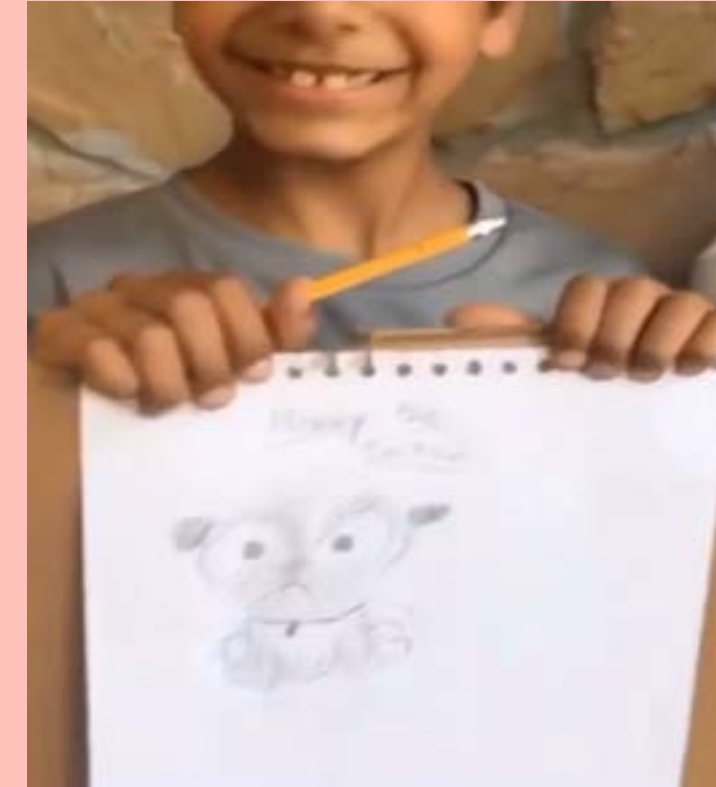
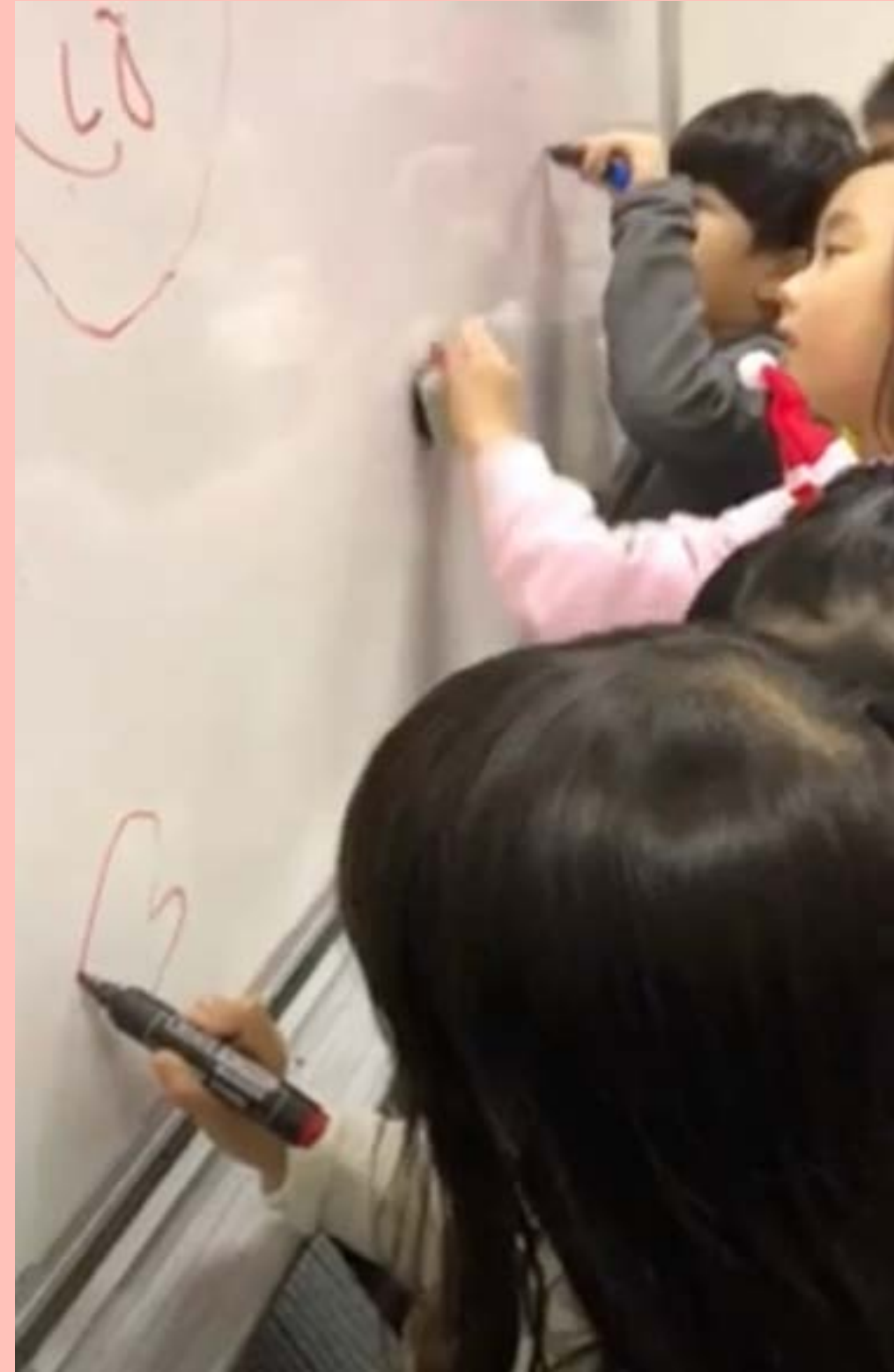
Hi-fi Render - Part 2 (Final)



Charms



Charm Design Inspirations



Charms



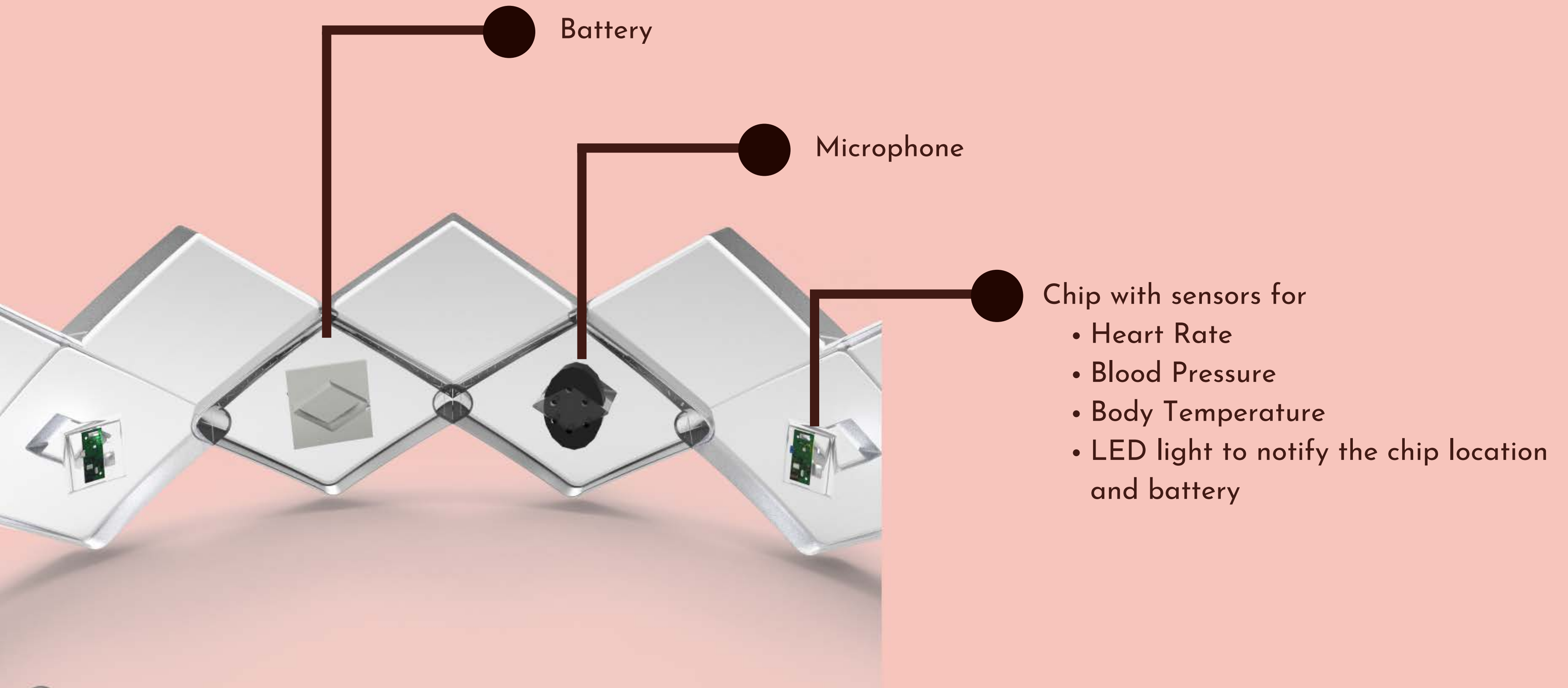
Technology

Prototype Render and Technology

Depth in how it works

Arduino with sensors

Hi-fi Technology



Hi-fi Technology



Based on User Testing,
Observed users washing the bracelet.



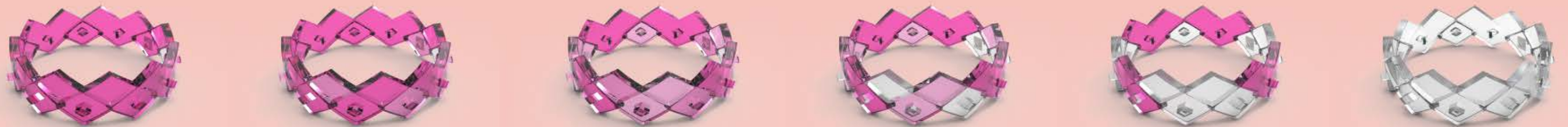
So designed to put sensors (board) inside the chip.

Depth in how it works

Electro variable photo crystalline structure

Solid flexible material that actively changes color in real-time through electrical stimulation

This technology will alert and help caregivers and children to be aware of unconscious abuse. Also, alert the abuse that the Voice AI is listening and recording the abuse situation and acknowledging the surroundings.



Material

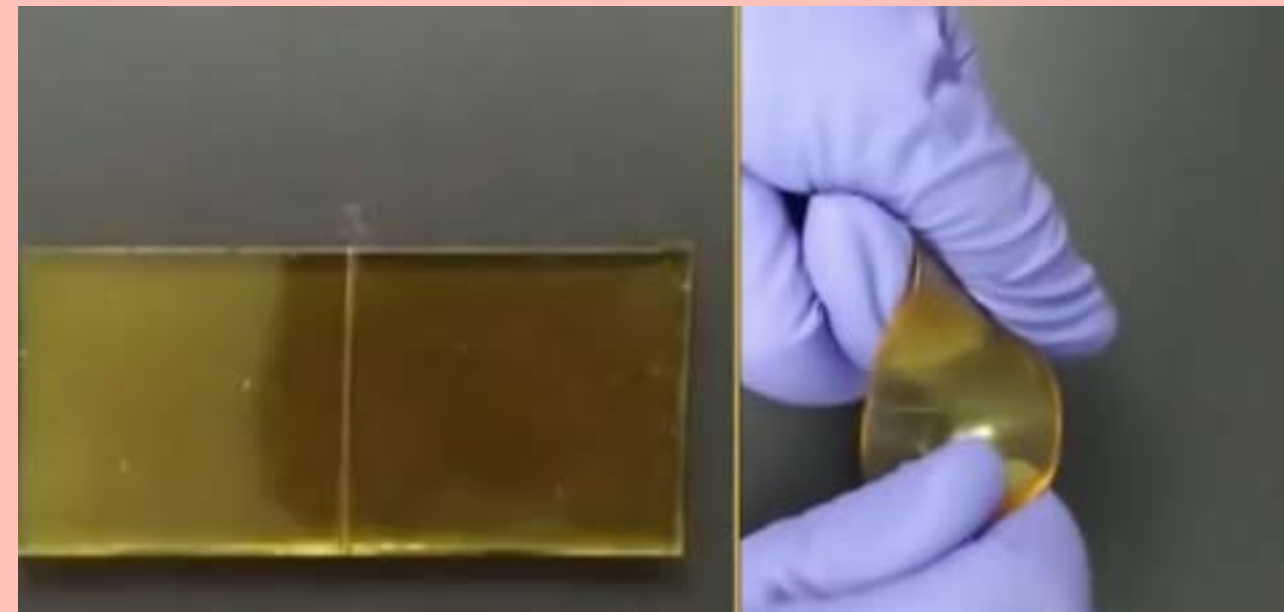
Self-Healing Polymeric Composite Material

Glass- Like Plastic.

A new material that has two contradictory properties at the same time, which is hard, tough, and has good self-healing capabilities.

When external friction or shock occurs, the molecular bonds of the material quickly become solid, protecting itself from impact, and recovering damage by returning to a soft state free of molecular movement after impact.

Inflammation tests with mice also show low toxicity.



Material

After cutting and attaching the parts together, let the material self-heal - even if you twist or pull it with your hand, or even hang 10kg of weights, it's fine.

Depending on the external pressure or the degree of impact, it controls the absorption of the impact by going back and forth between the solid and jelly and recovering the damage by itself.

Materials that are tough and strong and can recover on their own are highly utilized in that they can extend product life and always maintain the same state as new ones.

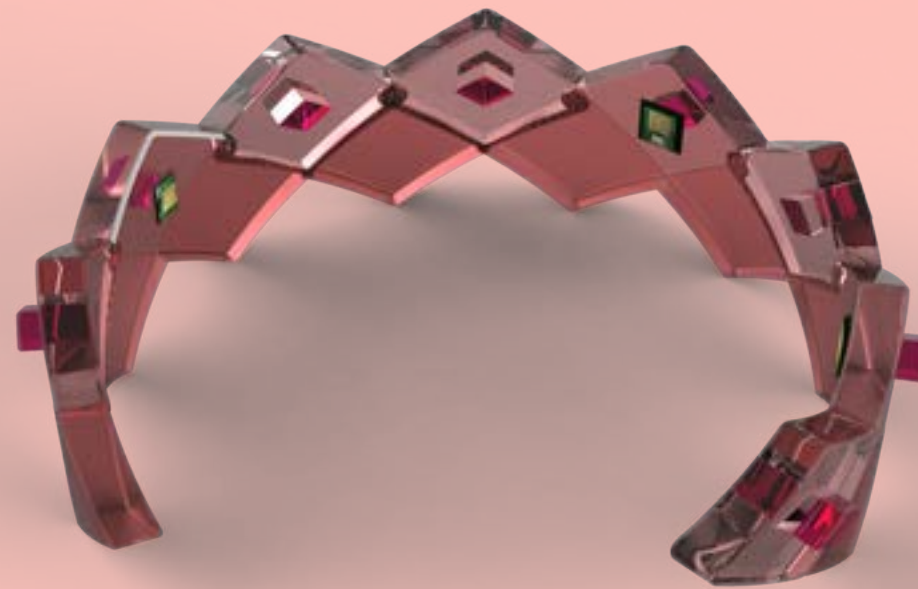
A plan is to make safer and more biodegradable polyurethane with fish oil extracted from fish heads, bones, intestines and shells have been developed and is being commercialized.



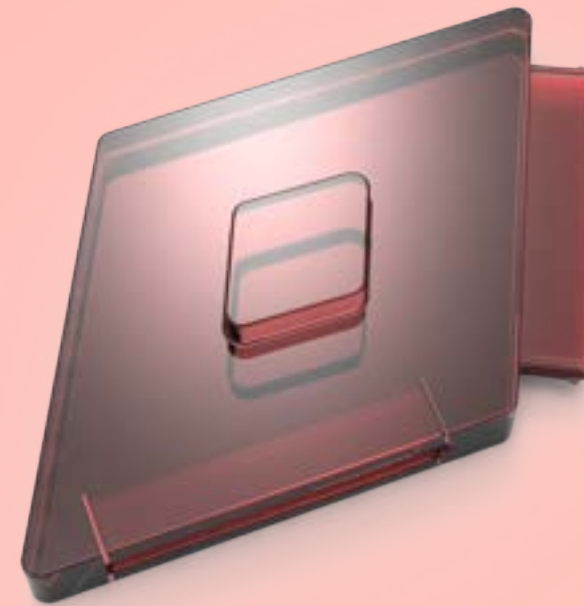
Depth in how it works

Size adjustable

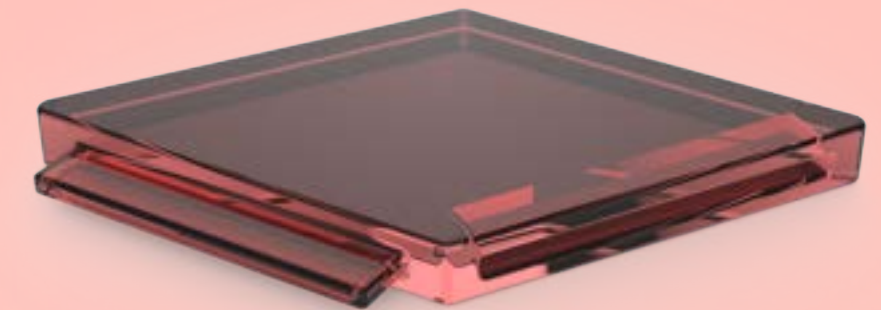
Fixated part



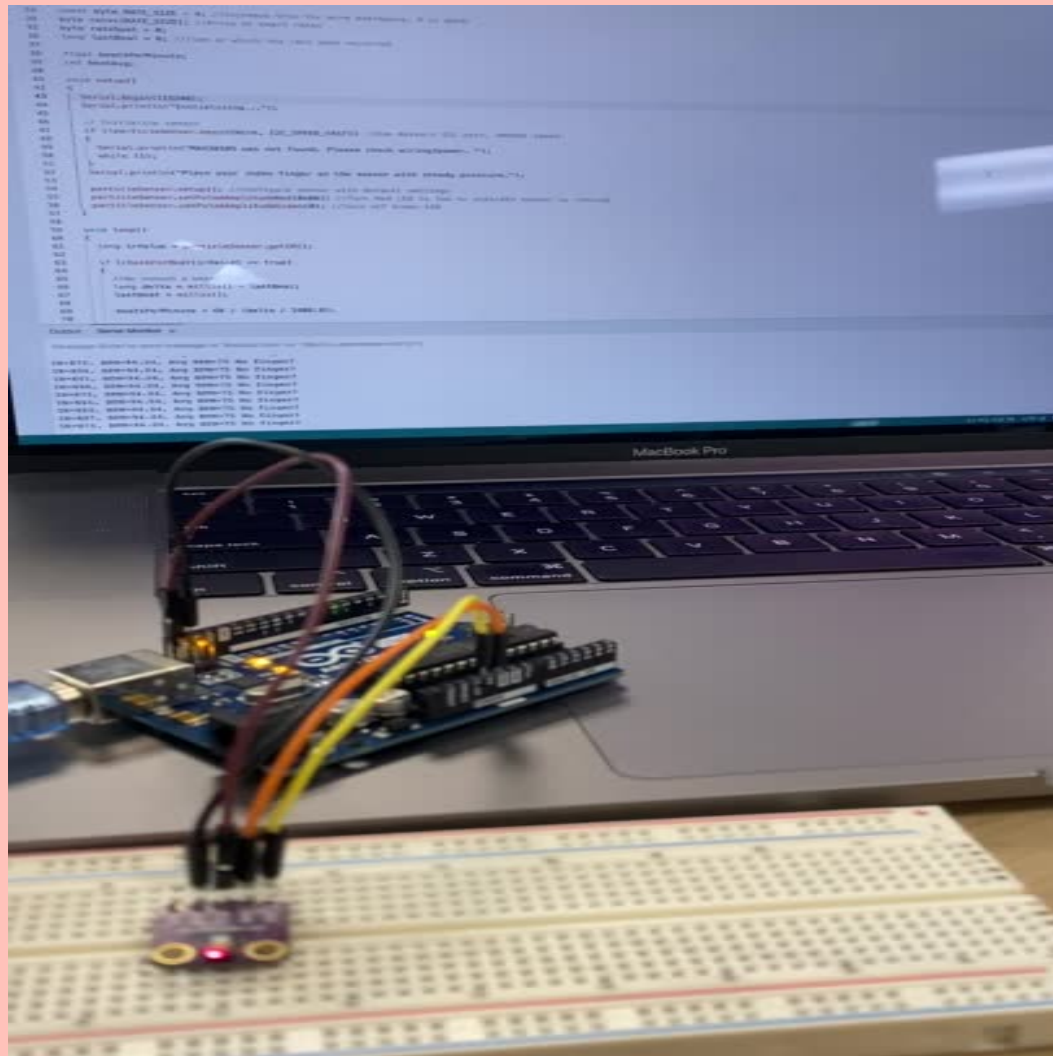
Positive



Negative

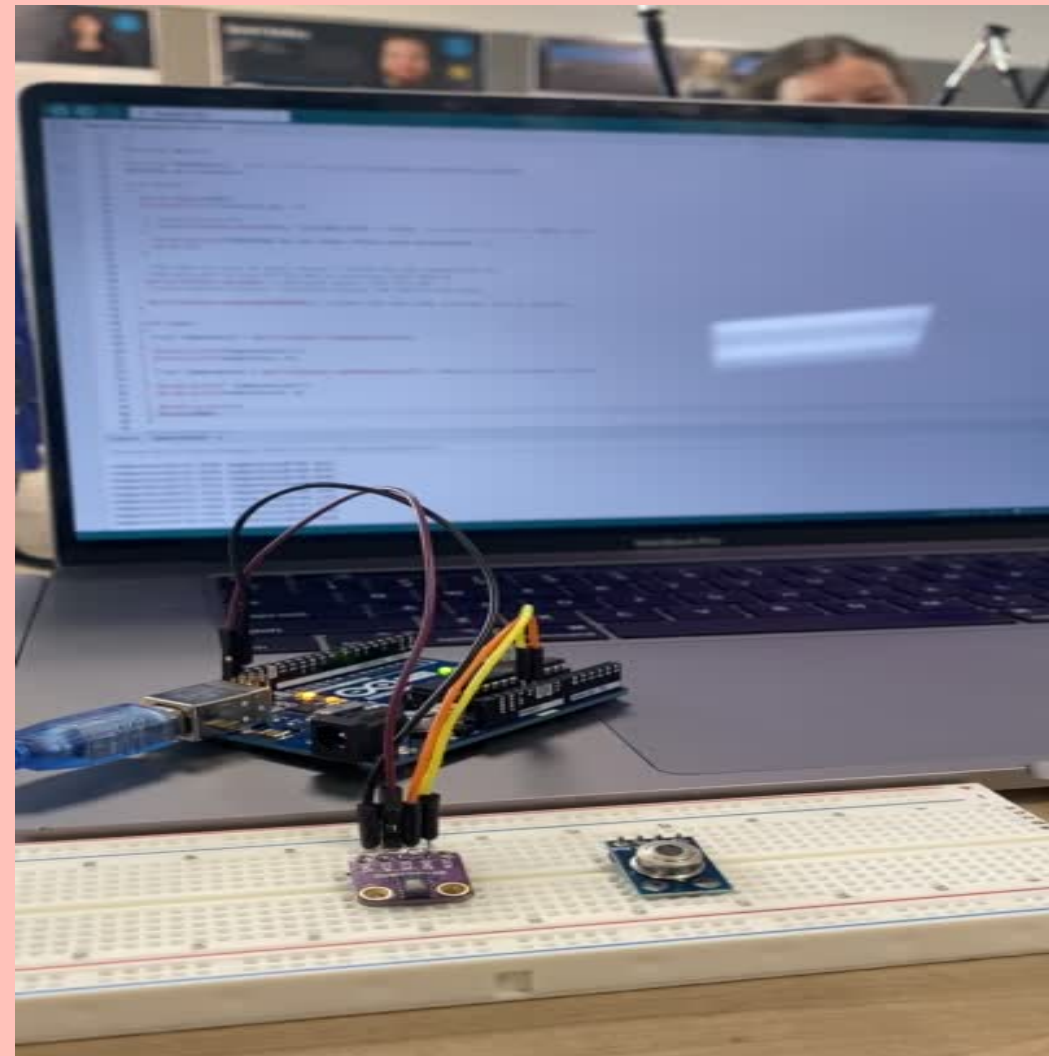


Arduino with sensors



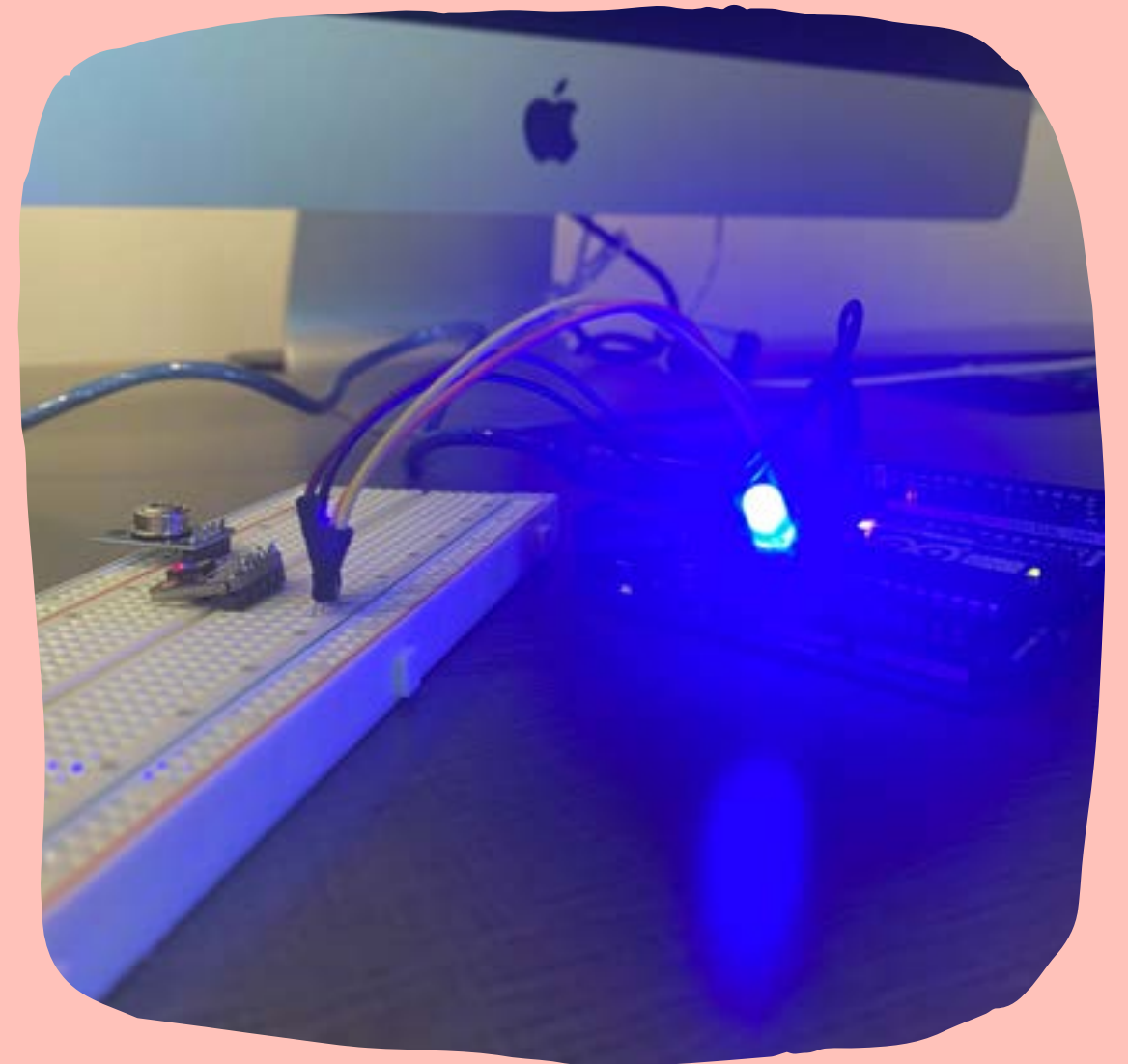
MAX 30102

- Heart Rate
- Blood Pressure



MAX 30102 or MLX90614

- Body Temperature



LED Lightbulb

- To notify the chip location and battery

With 7 User Testings on Physical Prototype (silicon),

- 4 UX Designers
- 13 Children under the age 15



Prototype on a kid



Prototype on a kids



Prototype on a kids



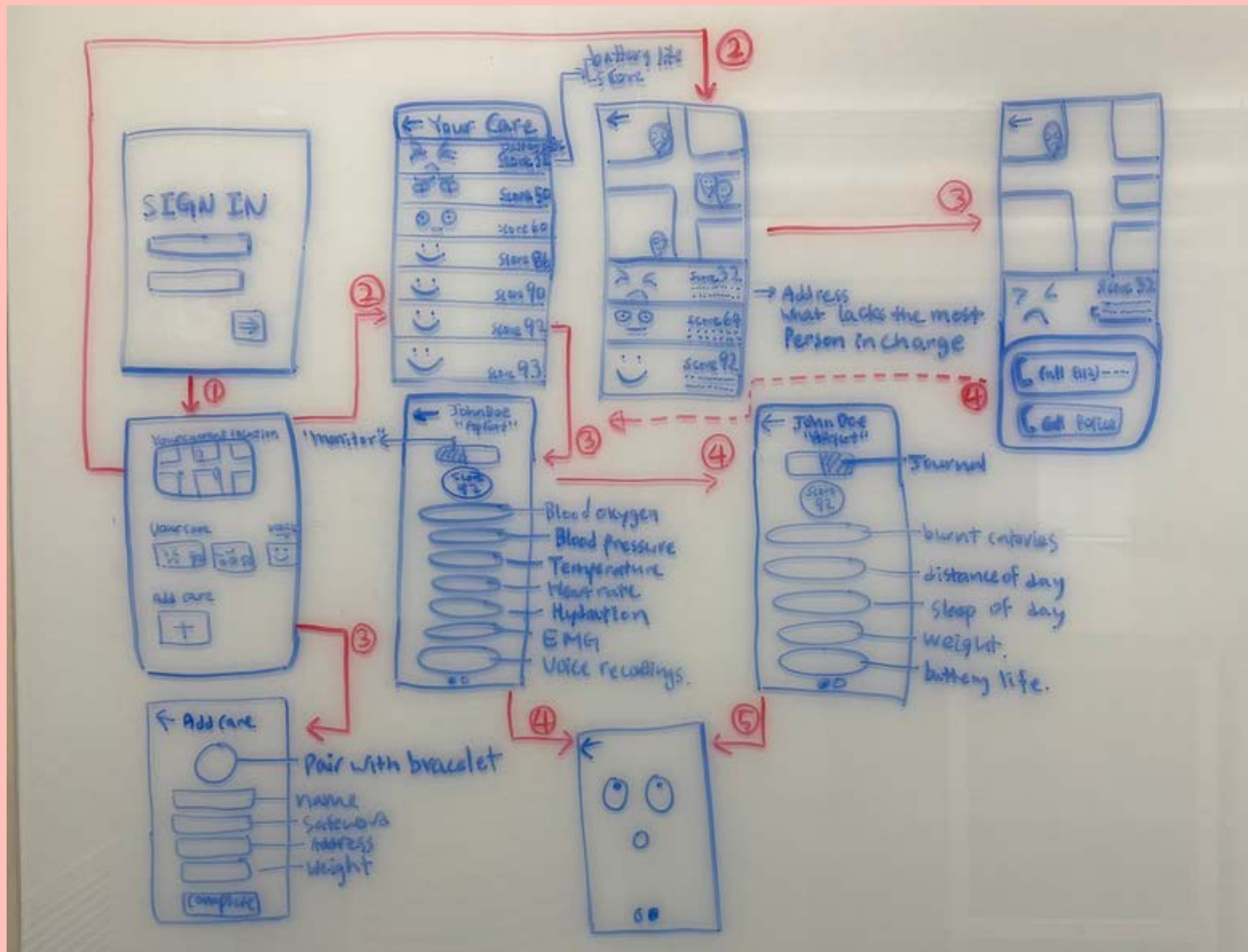
App

Low-fi

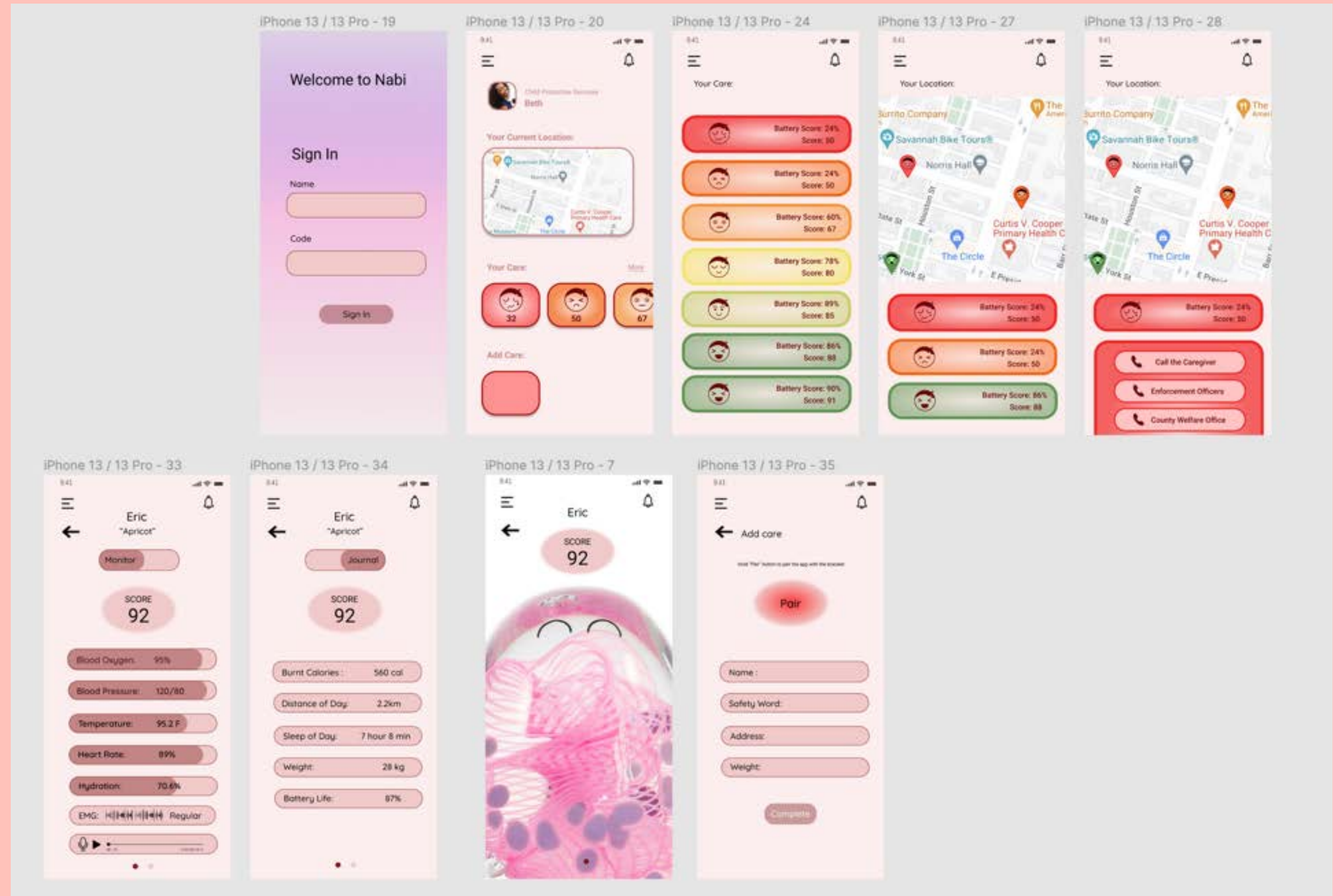
Mid-fi

High-fi and depth in how it works

low-fi UI



Mid-fi UI



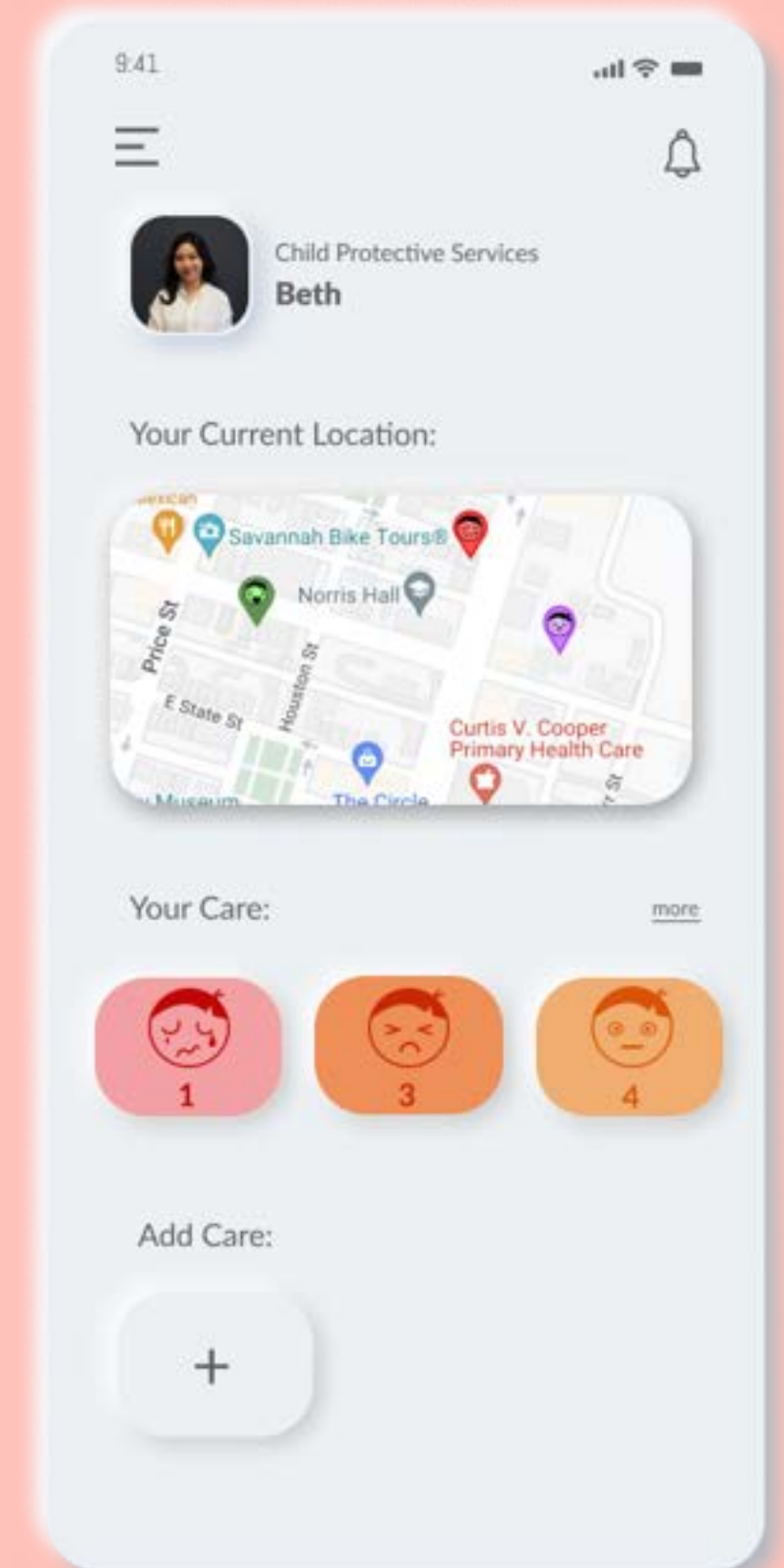
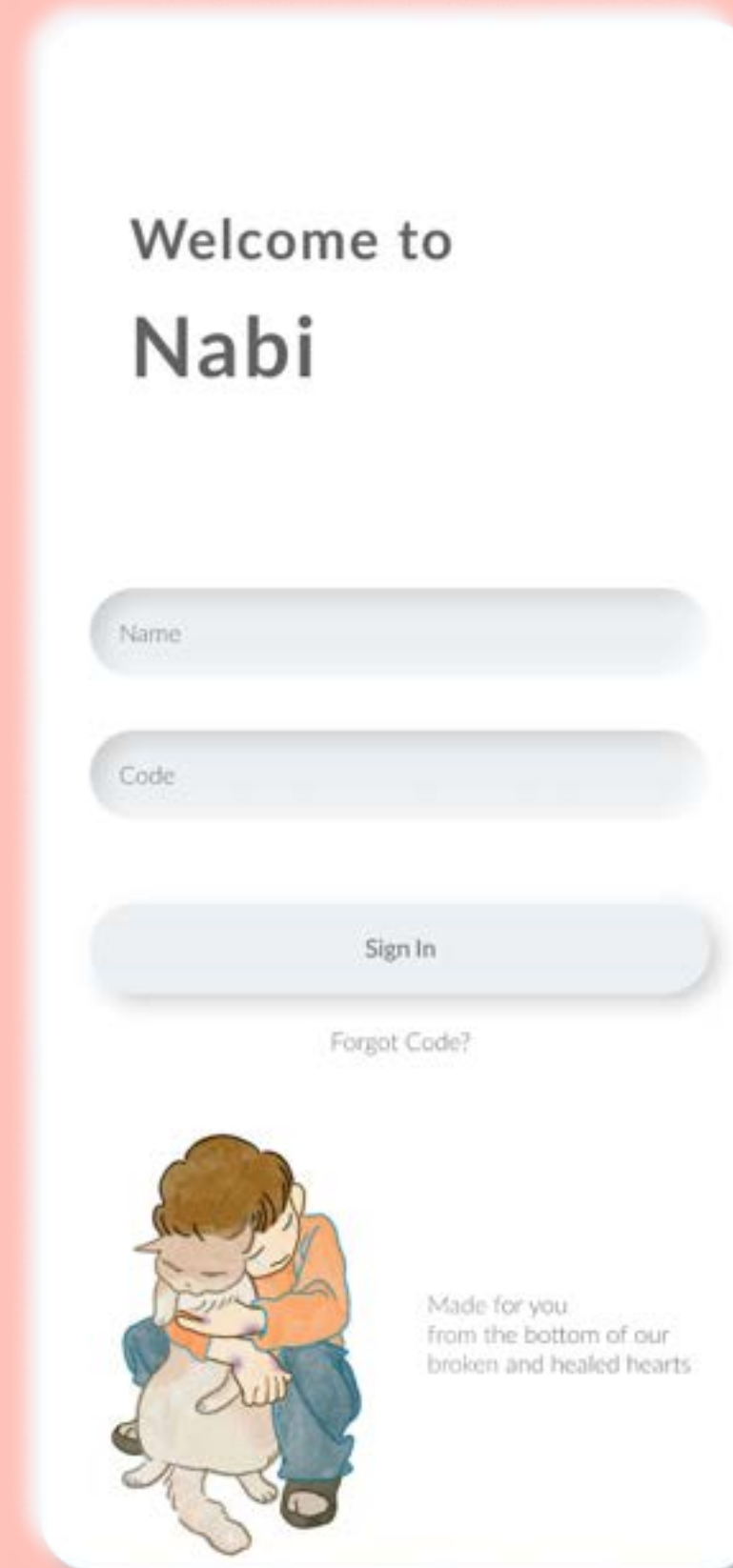
With 16 User Testings on App Prototype

- 9 UX Designers
- 3 Advertising Designers
- 4 Social Workers

I introduce you

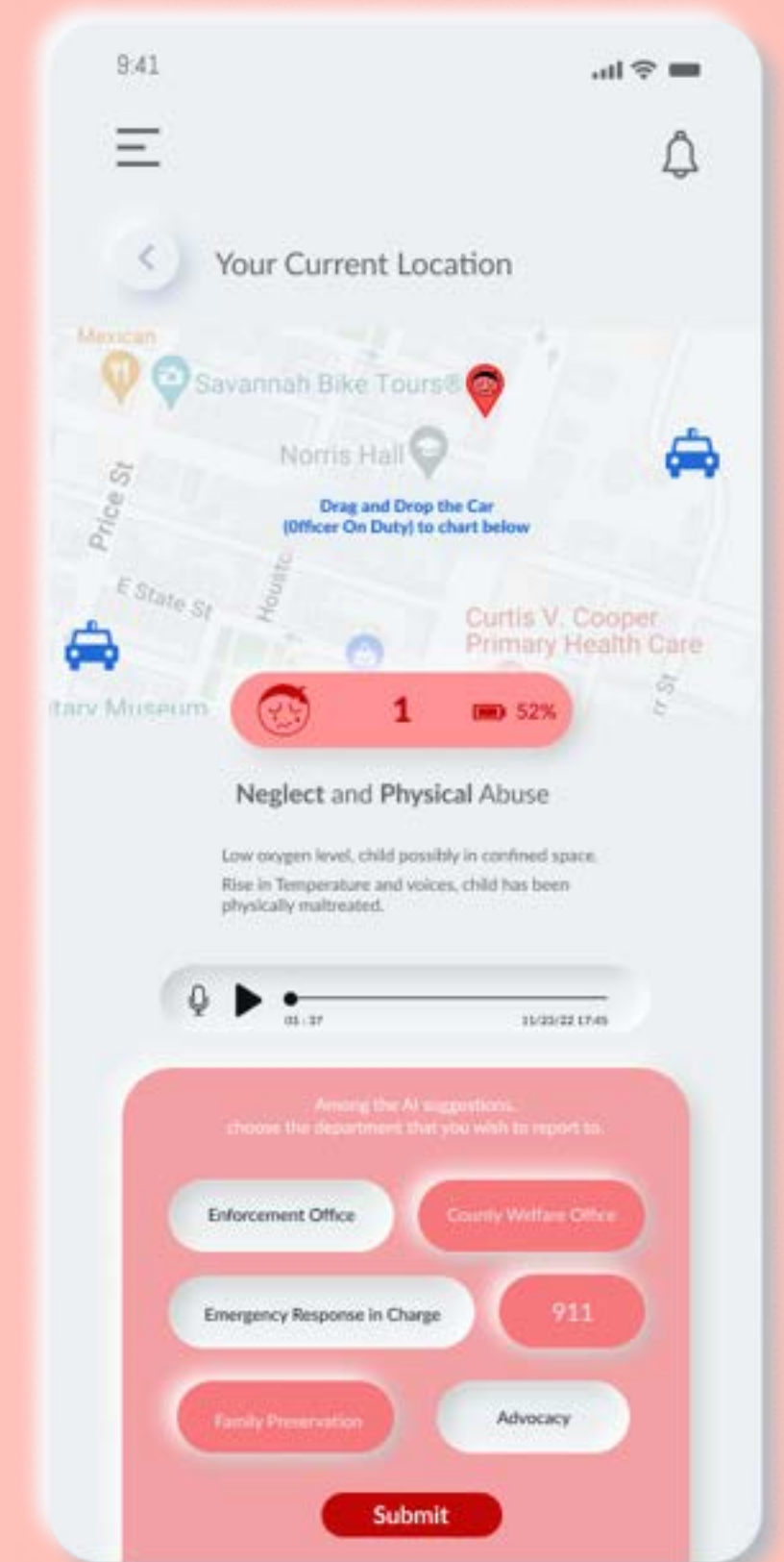
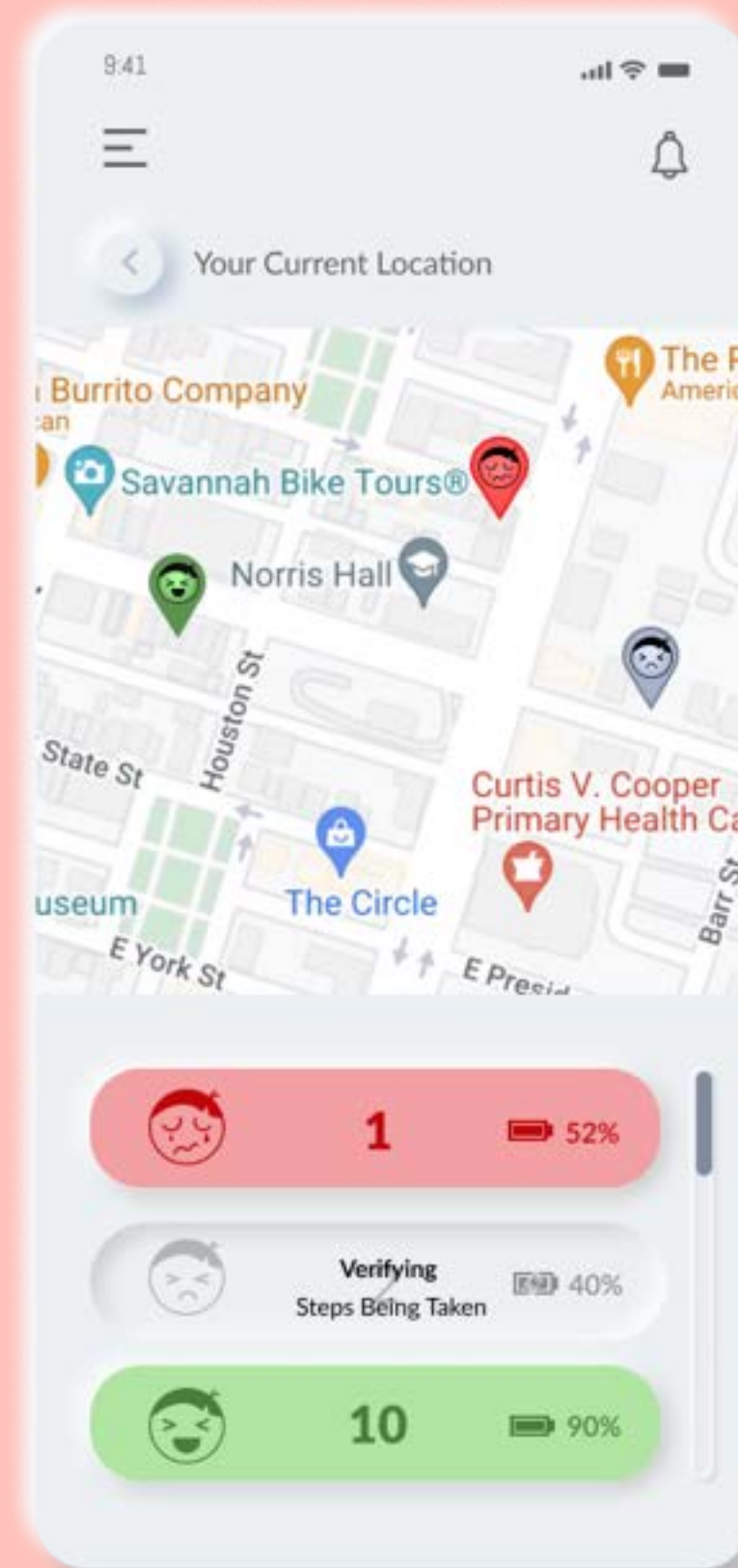
Hi-fi UI

- Onboarding
- Code represents who and which occupation is accessing the information/app.
- Shows summary of children's status under the user's care.
- Shows the child abuse cases around the user's location. Even the children are not under the user's care.
- Able to add new children under the user's care.



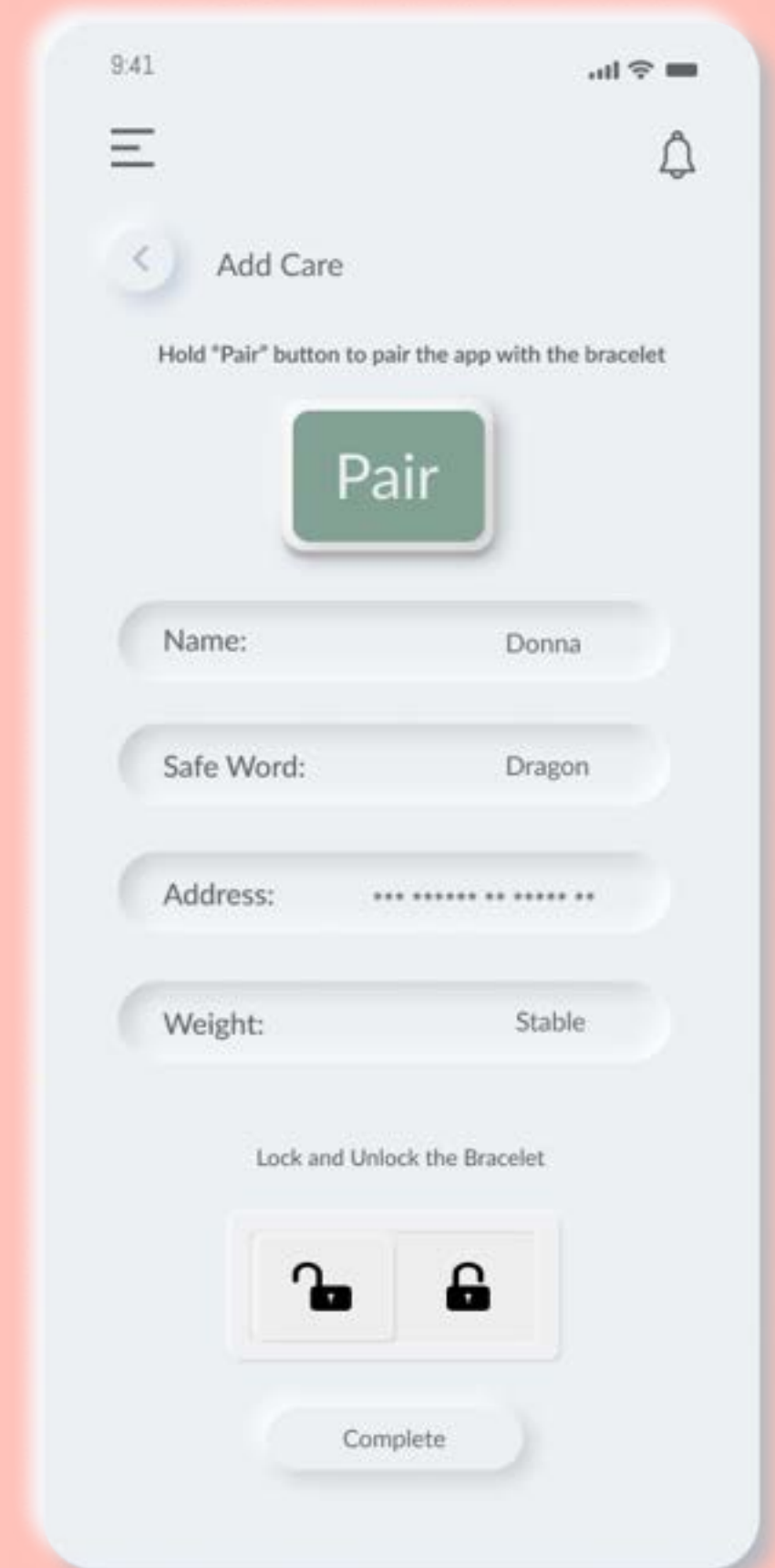
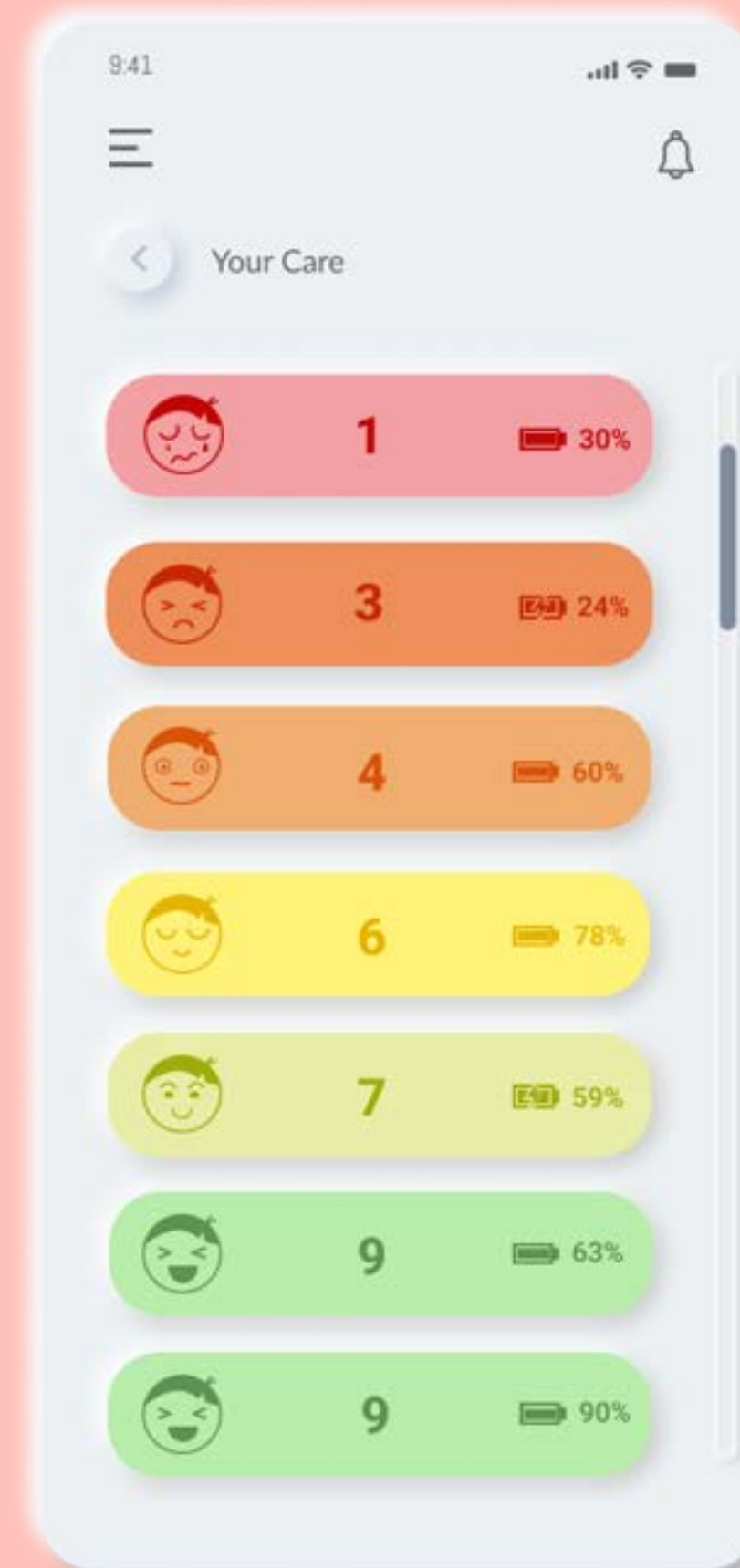
Hi-fi UI

- Location Feature
- Shows the child abuse cases around the user's location. Even the children are not under the user's care.
- Shows the status of who is in need of urgent attention/care and who is already taken care of.
- Shows all departments who can help the child in near surroundings.
- Provide easier, faster, safer options to make quick and correct judgments based on AI's support.
- Able to combine all needed departments to save one child. Which was and has been needed in the system.



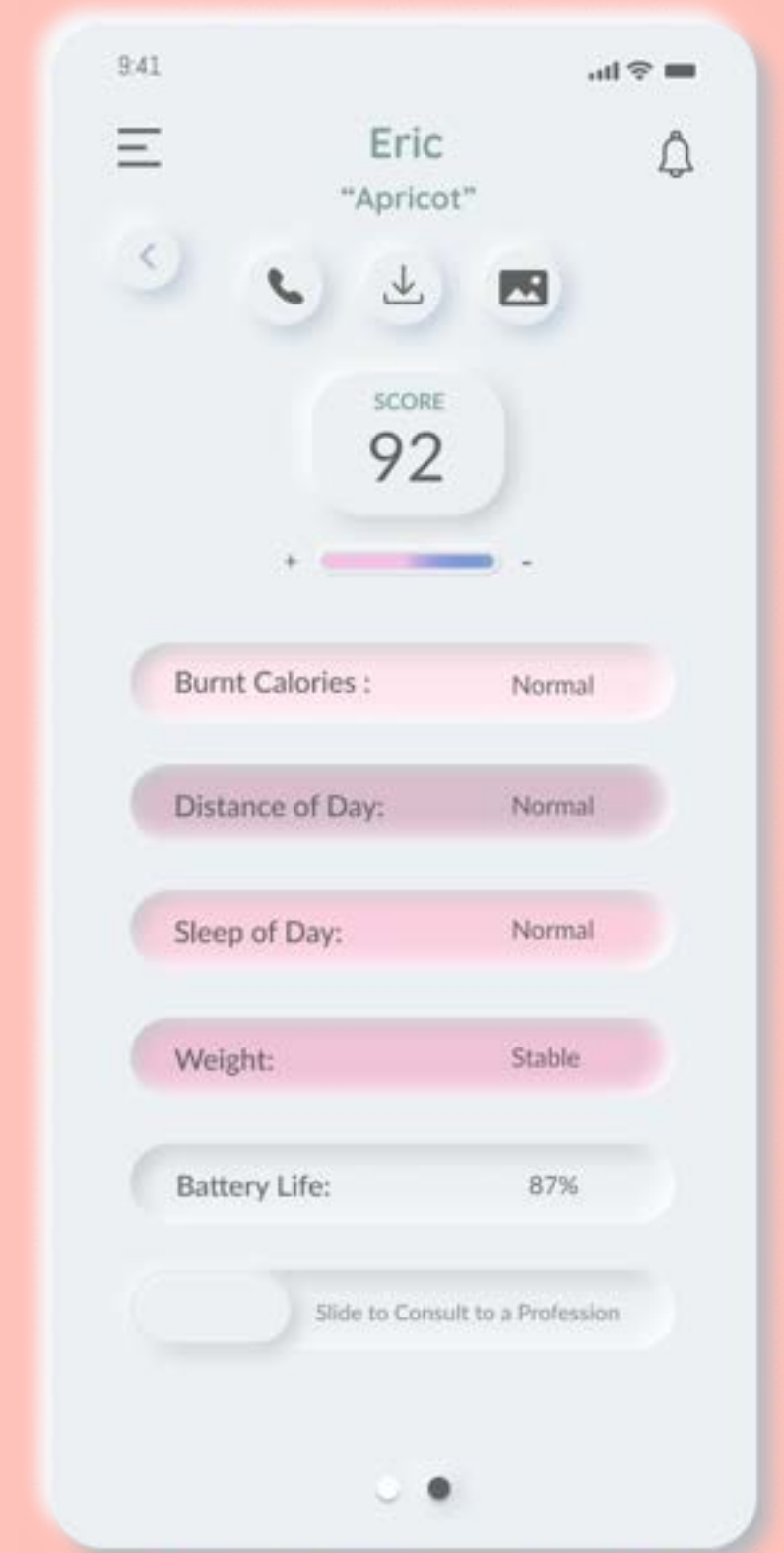
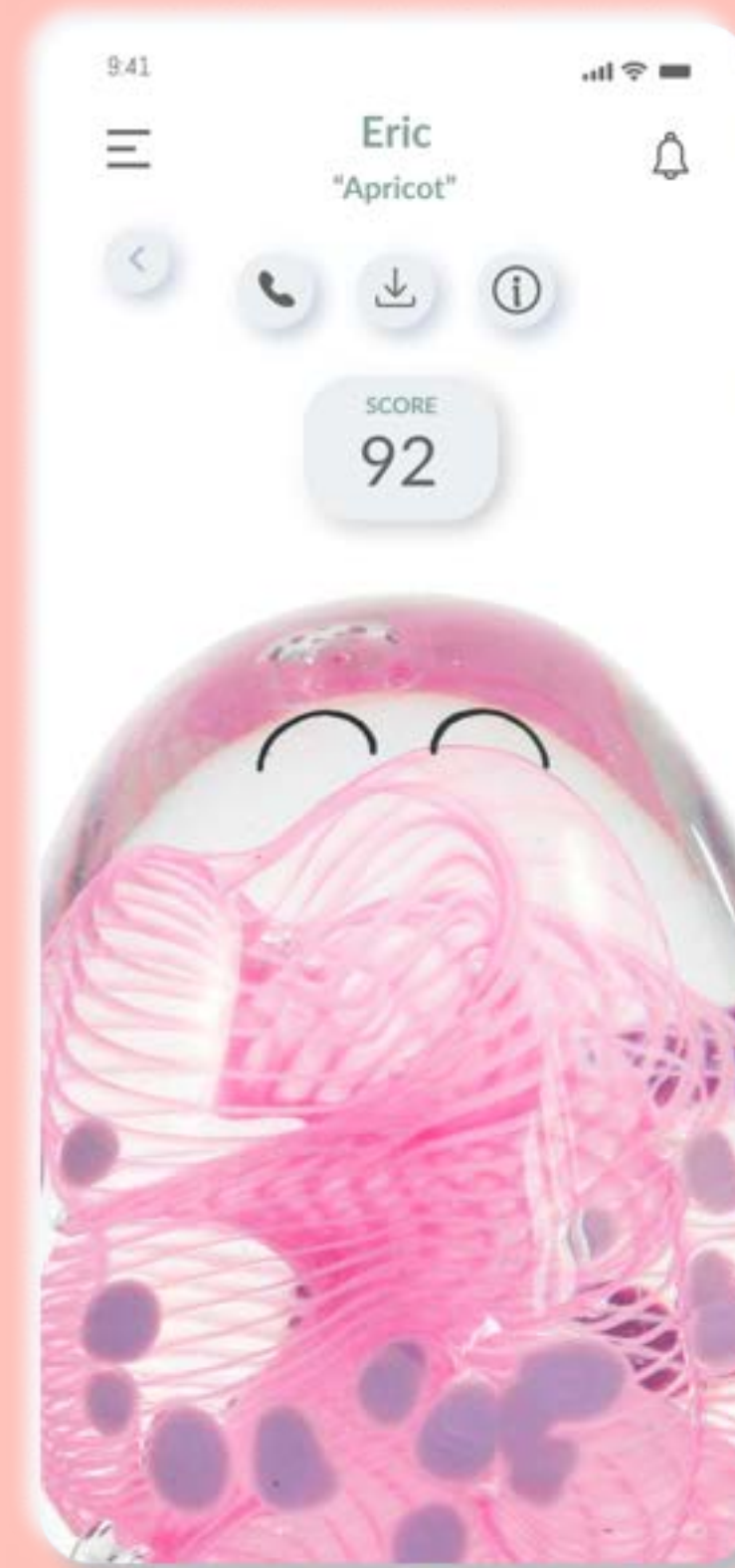
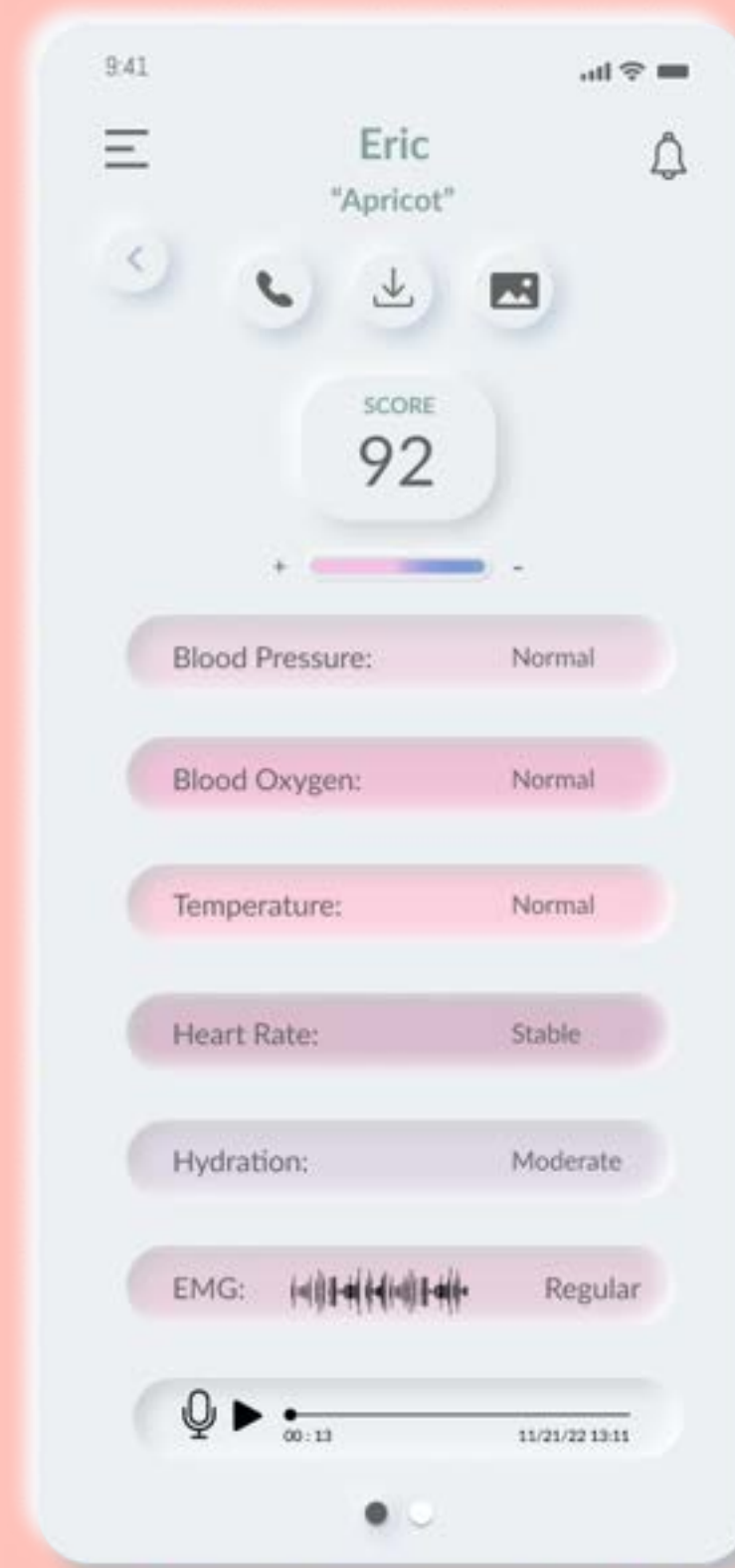
Hi-fi UI

- Care
- Able to see all the statuses of children under the user's care in one look.
- A quick way to pair a bracelet with the app for new children users for a bracelet.
- Able to lock and unlock the bracelet
- Able to get alerts when the lock has been disrupted by an external force.



Hi-fi UI

- Depth care and understanding of the child's status.
- All medical info provides enough to give info to the user but also protects the privacy of the child.
- AI art to show the summary of the chart
- Downloadable feature for recording the status without needing to screenshot the data page.



Business Concept Paragraph and Marketplace

There is no current self -protection system for abused children so this technology allows child advocacy centers to protect and get updated about the abused children's status in a more efficient and fastest way and able to provide the most suitable help.

This technology/product could be implemented for Child abuse/ Family Preservation social services. The Blue Ribbon Commission for Child Protection, California office and the Division of Family and Children Services, Georgia has shown interest in Nabi Project and will be used in real-world after further development for wider departments.

