

P O R

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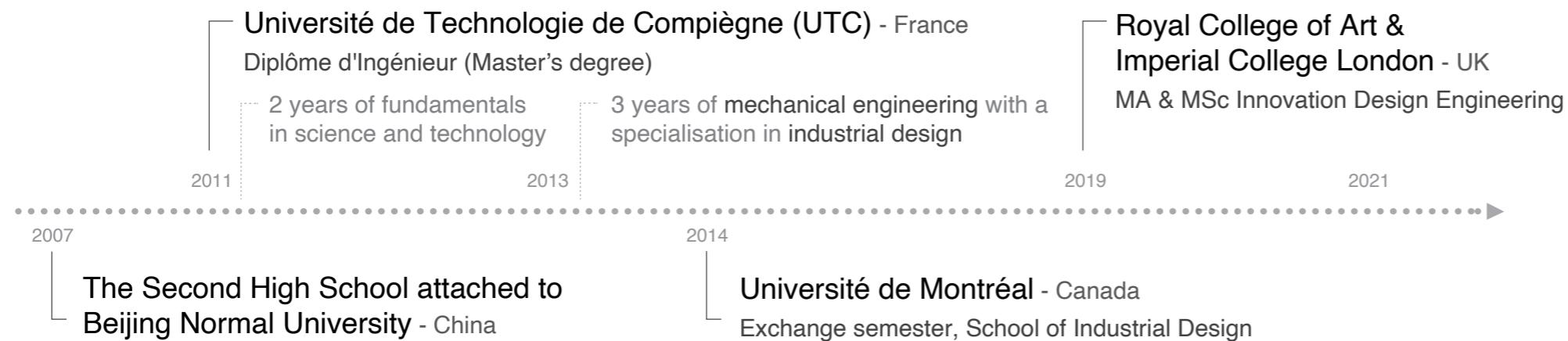


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Xian-Zhi ZHANG

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Education



Experiences

TANGIO LTD - Production Engineering Consultant

Aug. 2020 - Sep. 2020

Consulted for production challenges including components testing, prototype to MP validation and product inline test.

Withings (part of Nokia 2016-2018) - Product Design Engineer

Oct. 2016 - Jul. 2019

Led mechanical engineering for smart healthcare devices including BPM Core and BPM Connect - accompanying their product cycle from research, component sourcing, mechanical design, prototyping, productionisation, user testing, quality control to product launch.

EIT Health Wild Card - Participant

Jun. 2021 - Present

European Institute of Innovation & Technology venture incubator participant with BrightSide, the first communication tool for parents with chronic condition.

Parrot SA - Industrial Design Intern

Sept. 2015 - Jun. 2016

Proposed and implemented the design of an entertainment mini-drone and drone accessories.

Johnson & Johnson - Student Design Consultancy

Feb. - Jul. 2015 part time

Identified user pain points of a babycare product and proposed a packaging that streamlines the user experience.

Groupe Renault - Assistant Program Manager Intern

Feb. - Jul. 2014

Skills

Design

Sketching & Visualisation (Adobe Creative Suite, Keyshot); Concept Development; 3D Modeling (Solidworks, PTC Creo, Rhino, Grasshopper); Physical Prototyping; Figma

Engineering

Mechanical Engineering; Design for Manufacturing; Productionisation; Arduino; Quality Control; Product Reliability Testing; Component Sourcing; Project Management

Languages

French: Bilingual Proficiency
English: Professional Working Proficiency
Chinese: Native Speaker

Awards

Award

Innovation Awards 2019, Consumer Electronics Show (CES): Withings BPM Core

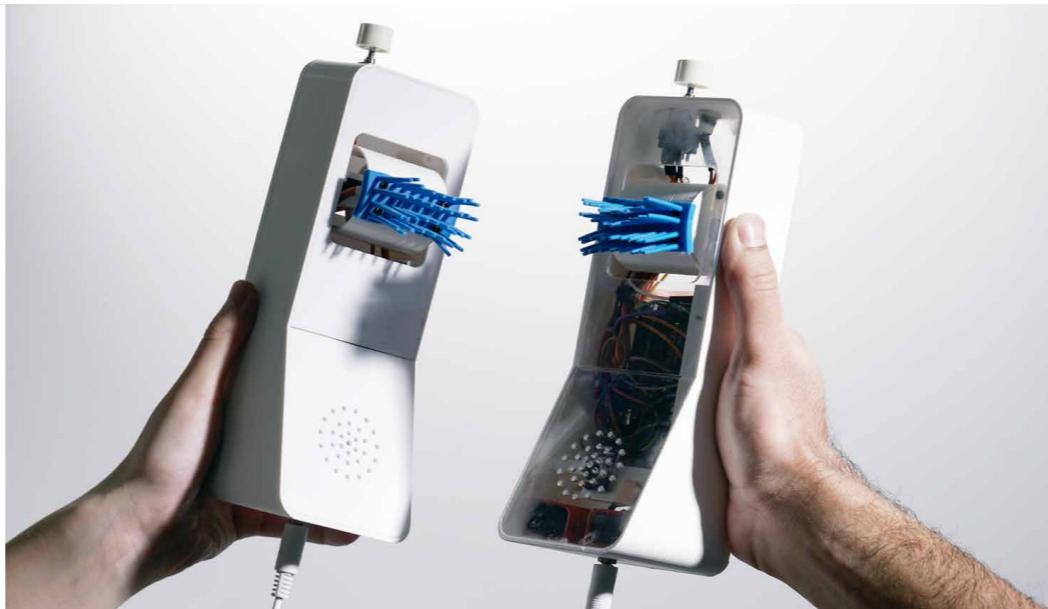
Patent

Cuff-Type Monitoring Device For Monitoring Cardiovascular Parameters: [20200214578](#), [20200214577](#)

Device for analysing cardiovascular parameters of an individual: [20200121197](#)

Press

[Dezeen](#) & [Business Insider](#): RCA students design phones that turn speech into physical sensations



Withings BPM Core & BPM Connect

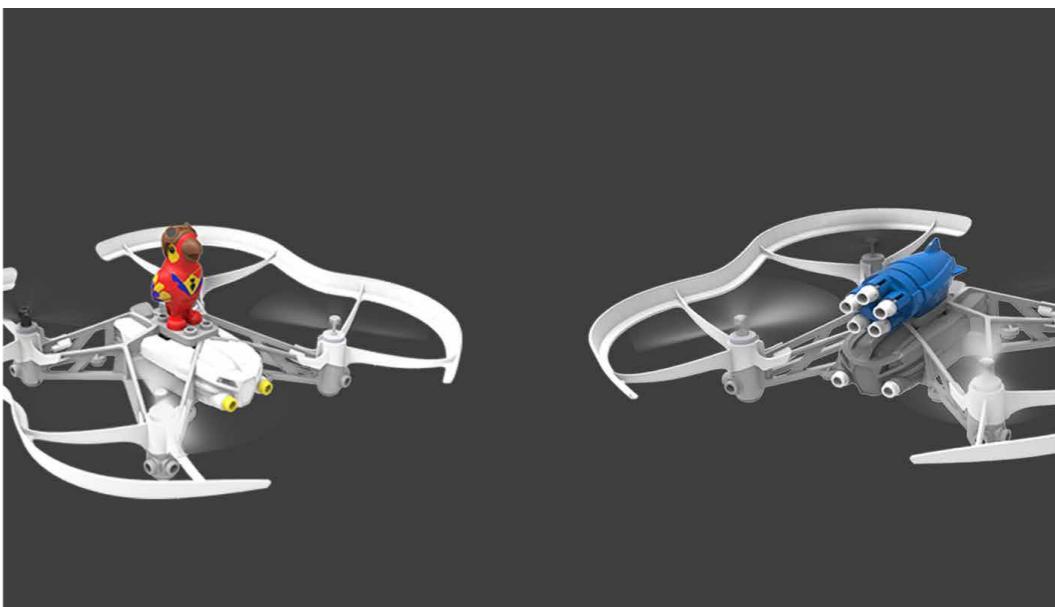
Connected Health Monitors

Feel the Conversation.

Haptic Interaction

BrightSide

Chronic Condition Communication



COMET

Urban Air Mobility

SensorWake

Olfactory Alarm Clock

Parrot Accessories

Connected Drone Accessories

WITHINGS

BPM Core



Withings BPM Core is a smart personal health monitor that keeps track of three key aspects of cardiovascular health: blood pressure, electrocardiogram and valvular health.

I worked as the lead mechanical engineer with a team of engineers, designers and manufacturing partners to bring BPM Core to the market.



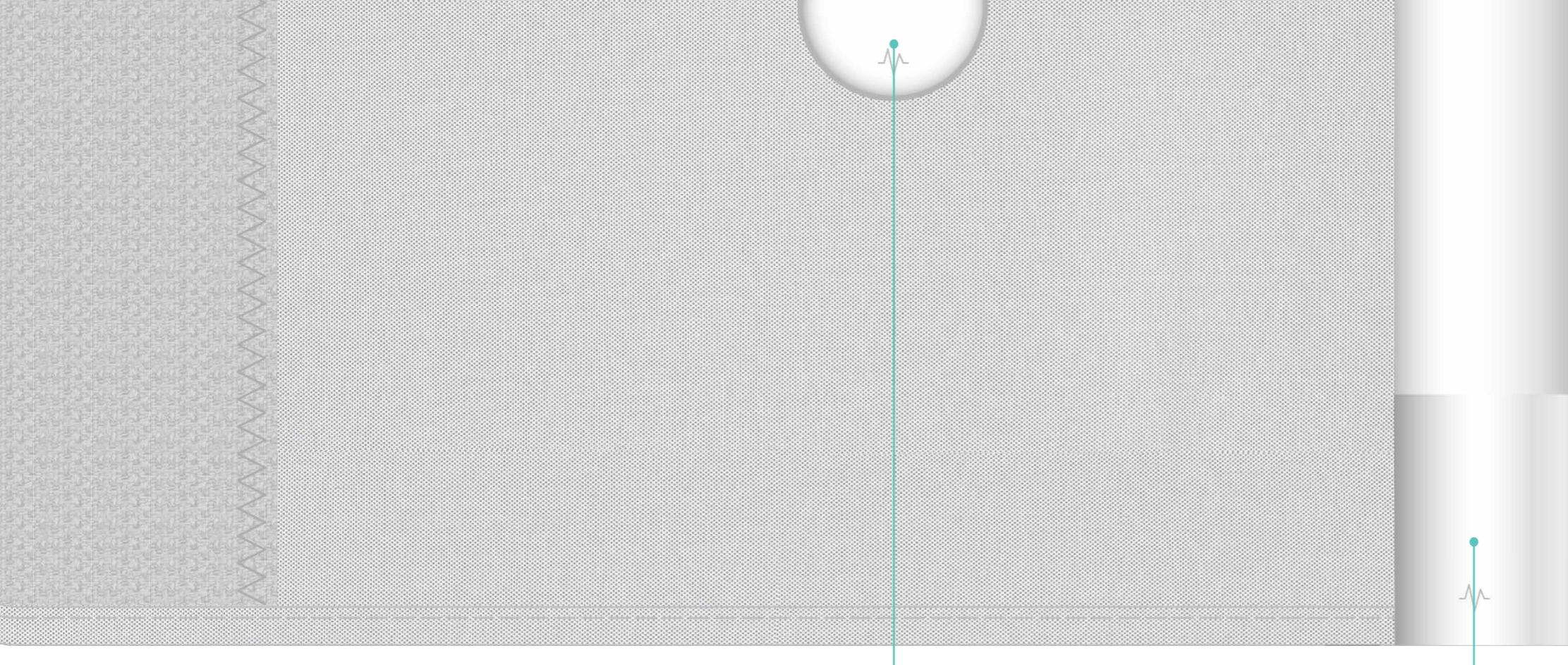
Scan the QR Code or click on the picture for more details.

Withings BPM Core is recognised with the CES 2019 innovation awards and distributed by Withings distribution partners including Apple Store and FNAC.

Product Design Engineer

2016 - 2019





With the press of a button and in the comfort of your home, BPM core detects and enables early prevention of a variety of cardiovascular diseases.

Working on a healthcare product requires extreme attention to the accuracy of the measurements.

I went through a large body of literature and many design iterations in order to eliminate mechanical interferences to the measurements.

BPM Core has received CE medical clearance.



Blood pressure monitor

Prevents **hypertension** - a leading cause of heart disease and stroke that exhibits no apparent symptoms.



Stethoscope

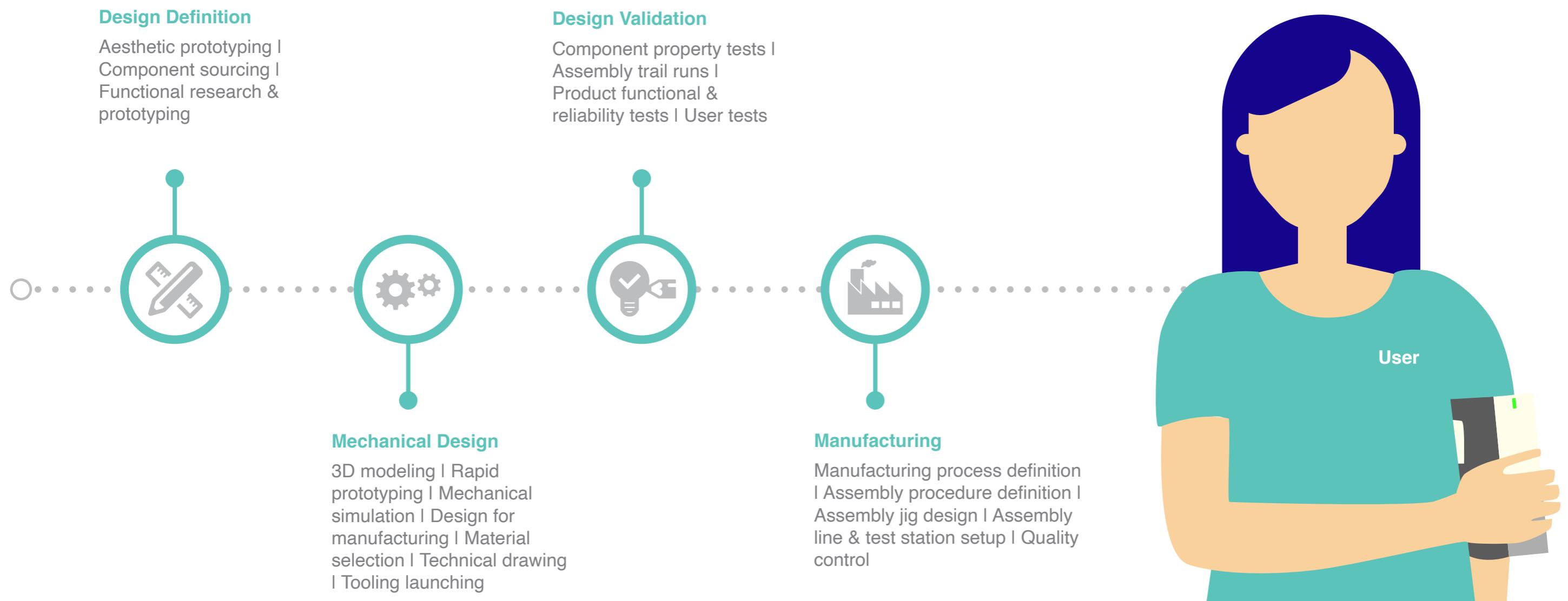
Detects **valvular heart disease** - a defect of the heart valves that can lead to heart failures.

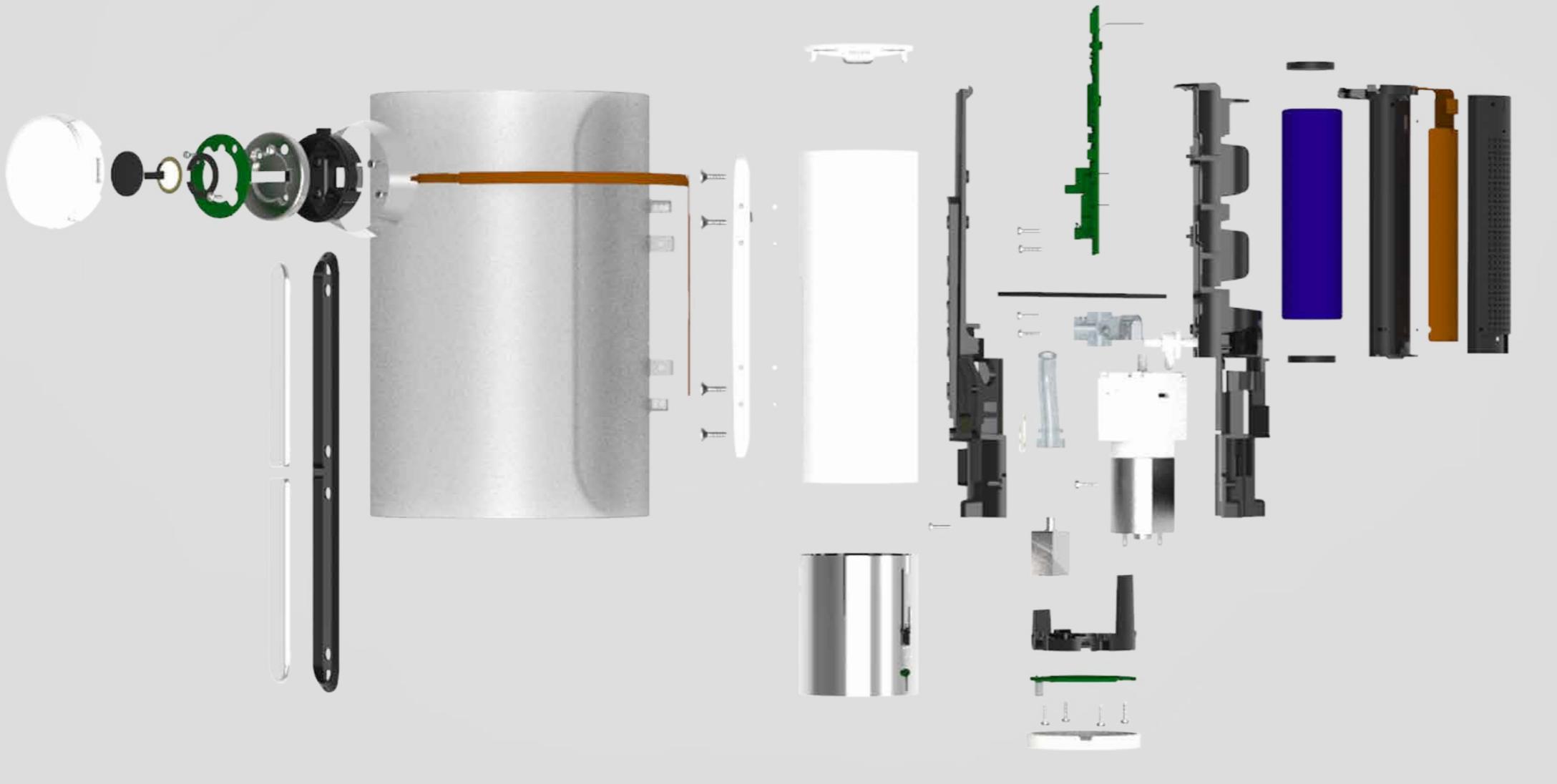


Electrodes

Detect **atrial fibrillation** - the most common form of arrhythmia that can lead to heart failures.

I accompanied the product through its **full product cycle**, including design definition, component sourcing, product conception, prototyping, design validation, tooling launching, and assembly validation through to its launching.





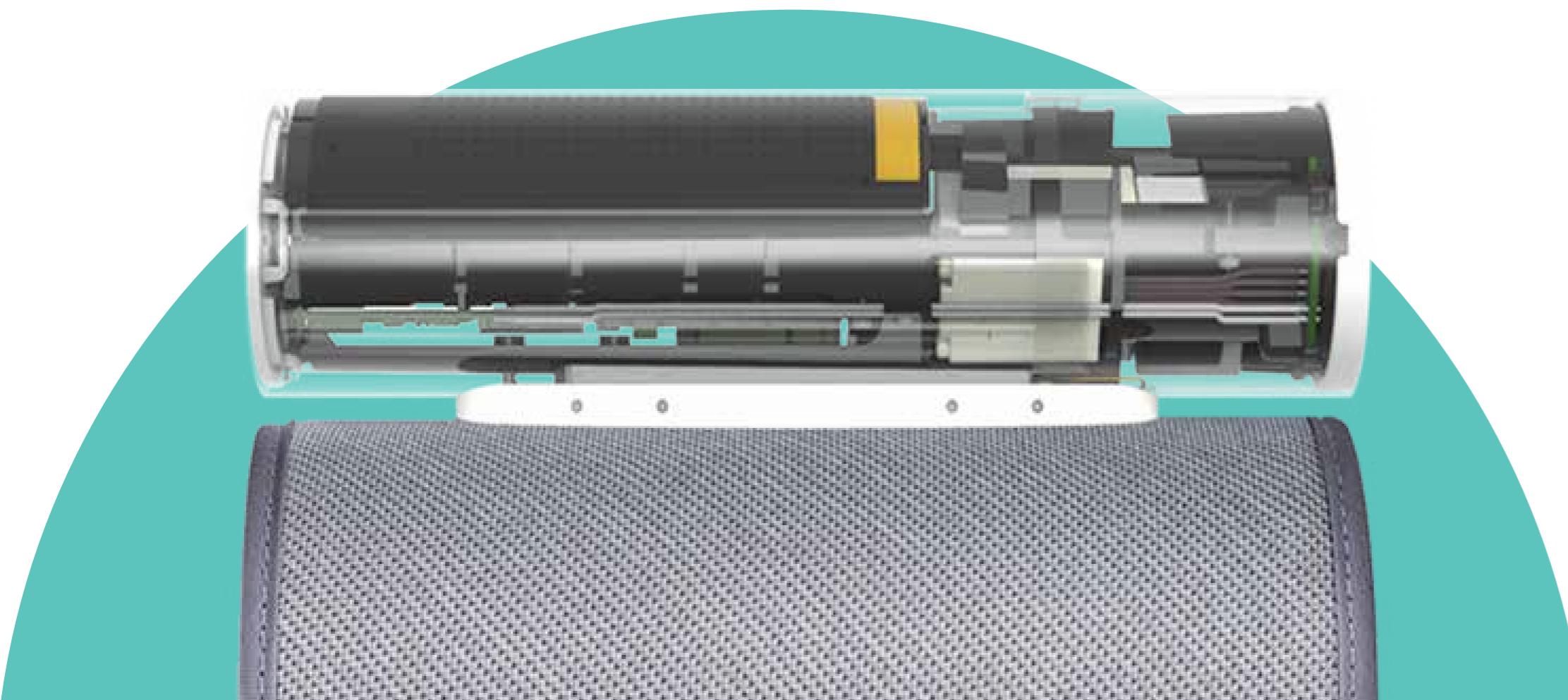
I am always fascinated by the myriad of factors that need to be taken into account when selecting materials for a lasting product: from their **mechanical properties** (hardness, weight, conductivity, Young modulus, etc.), **aesthetics properties** (color, finishing, coating) to their **fabrication processes** and costs.



Silicone logo integrated with cuff fabric

Cuff fabric with embedded metal electrodes that balance between aesthetics and signal accuracy

Metal tube with special texture to improve signal accuracy



Attention to details, thoughtful decisions and rigorous testing all contribute to the finished product that translates to real-world differences for the end users.



Integrated LED screen

Accessible and intuitive switch button

Flexible cuff fabric with integrated stethoscope

withings
BPM Core



WITHINGS

BPM Connect

Withings BPM Connect is a smart blood pressure monitor that accurately captures systolic and diastolic blood pressure plus heart rate. The **compact** and **intuitive** design of BPM Connect makes it easy to monitor blood pressure both at home and on the way.

As the **lead mechanical engineer for the project**, I worked with a team of engineers, designers and manufacturing partners to bring BPM Connect **to the market**.



Scan the QR Code or click on the picture for more details.

Withings BPM Connect is distributed by Withings distribution partners including Apple and FNAC.

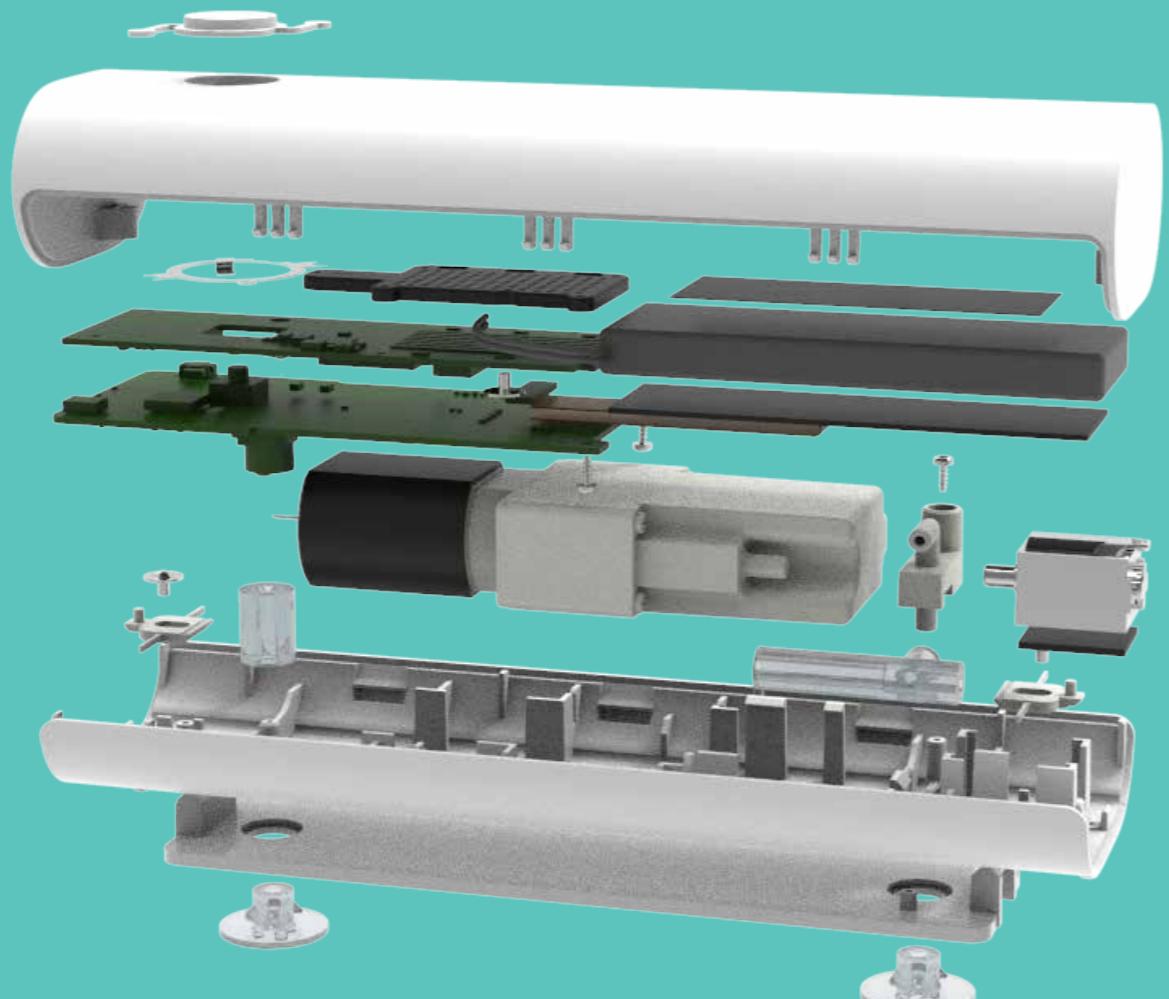
Product Design Engineer

2018 - 2019

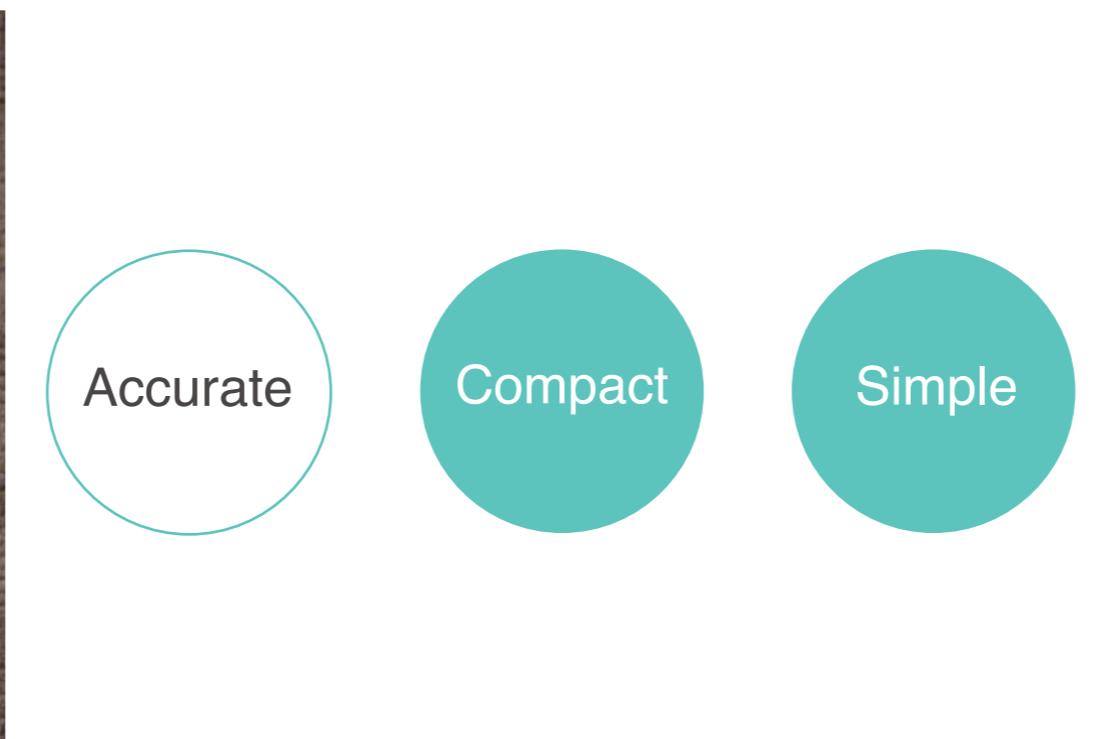


I accompanied BPM Connect over its full design-production cycle. I gained in-depth understanding of industrial design and manufacturing processes.

By constantly challenging standard procedures and working with different stakeholders, the final product turned out intuitive, compact with a design centered on users.



I have always wanted to create impactful products that bring **social benefits** to people. At Withings, I am proud to have contributed to making these beautiful, sophisticated yet accessible healthcare products possible.





Feel the conversation.

Feel the conversation. is a student project that challenges how people experience communication by **substituting language with haptic feedback**. This project is an experiment that investigates if communication could still take place without verbal conversations.

So far, users have described feelings of closeness, excitement, disgust, intimacy and more. What will your conversation feel like?



Scan the QR Code or click on the picture to see examples of interactions.

The project has been selected by design magazine [Dezeen](#).

Interaction Design

2019.11 - 2019.12

Student Project (in pair)

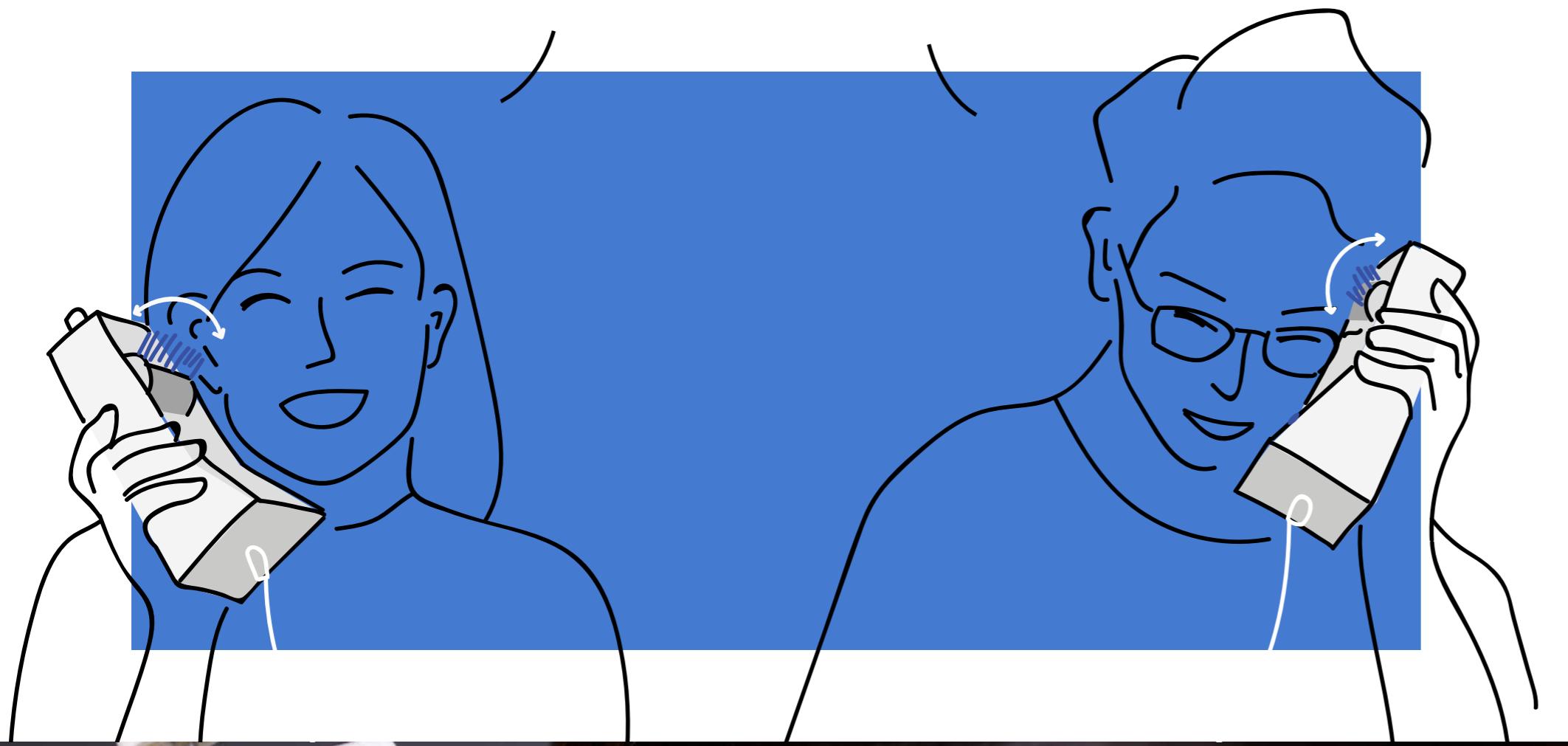


Feel the conversation.

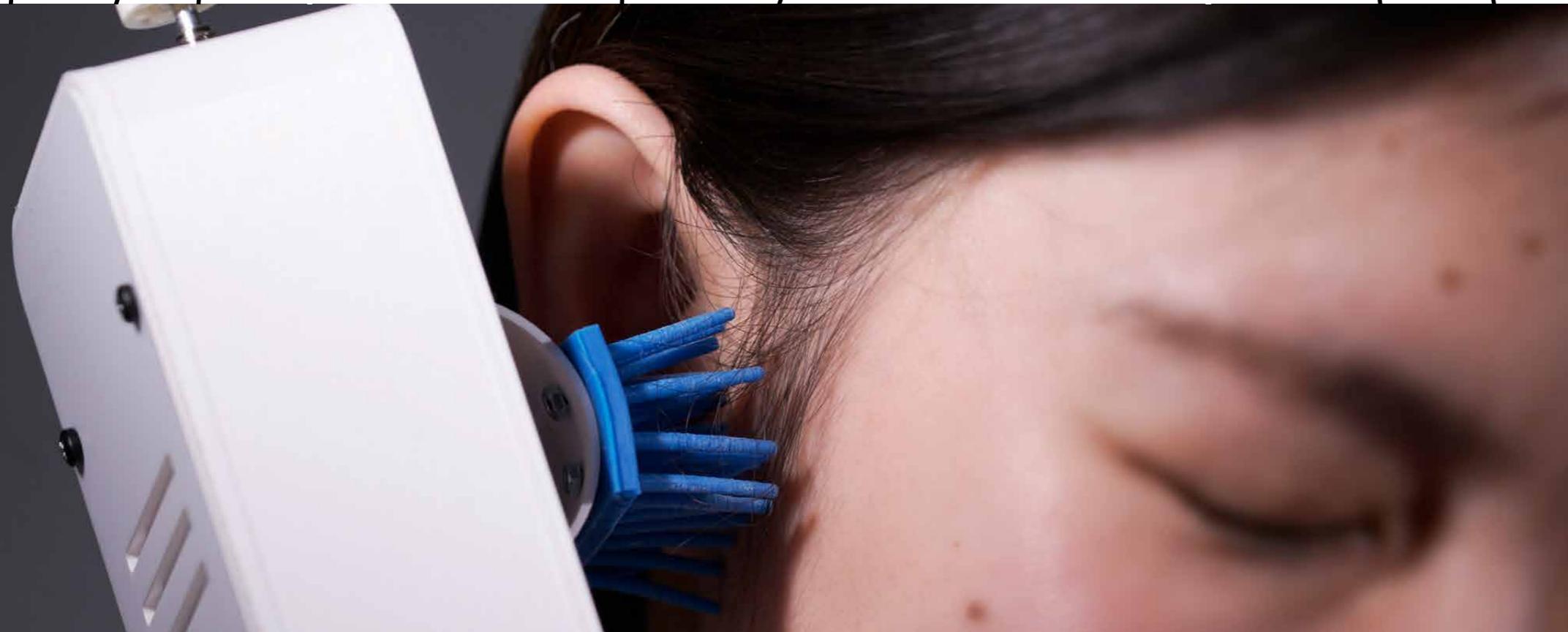
Design Objectives

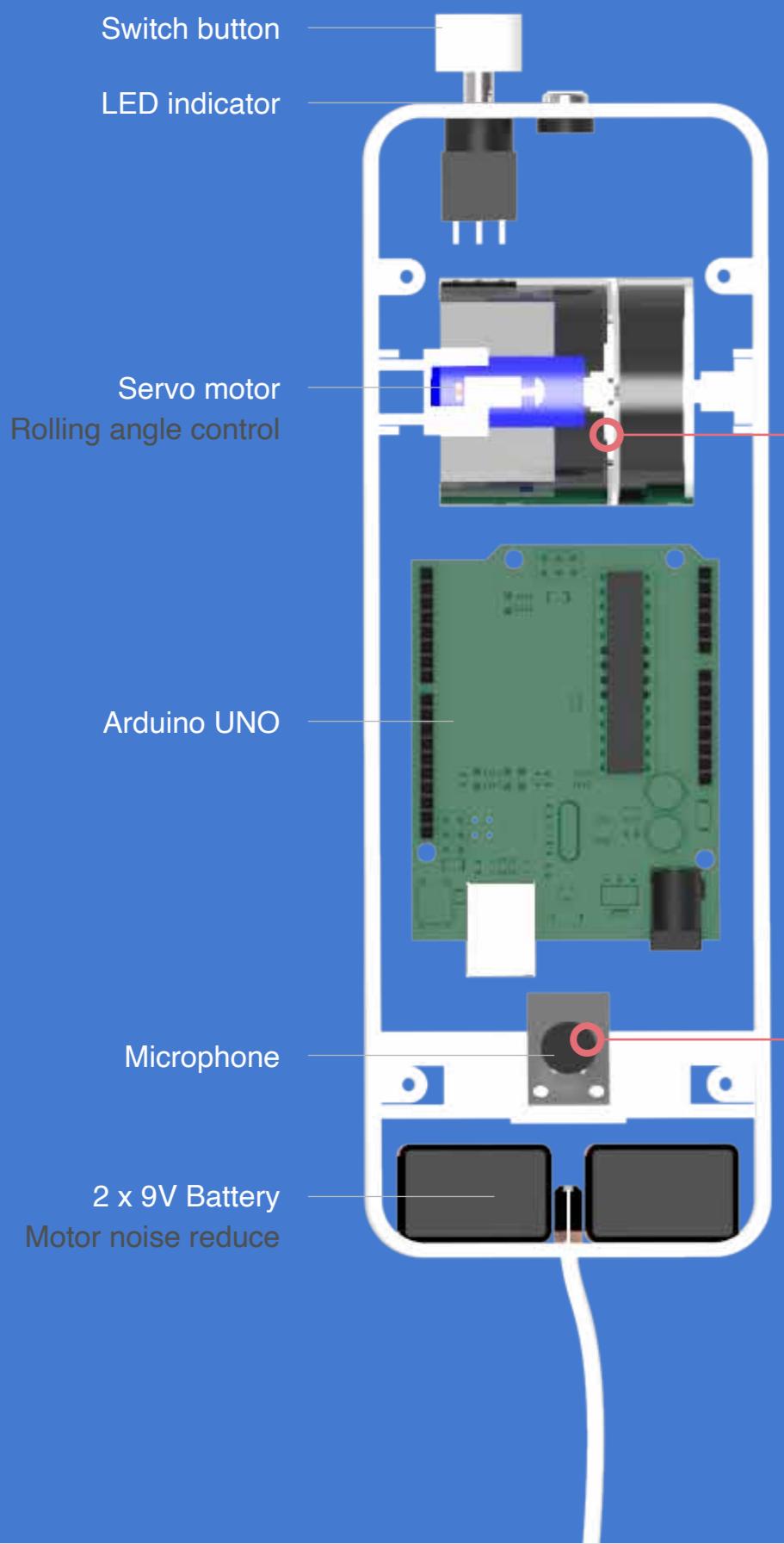
嗨，最近怎么样？

I'm fine, and you?



The experiment is designed around two phone-shaped devices for a pair of users. The interaction is **intuitive**: the devices' form factors make the desired reactions obvious to users. However, instead of a speaker that transmits sound, a rotating wheel induces a sensation on user's ear while the other user is speaking. Whatever languages used, as one person speaks into the device gently or loudly, the wheel on the other side will move slower or faster accordingly. The users will thus feel the conversation.



Phone A**Phone B**

Feel the conversation.

Technical Details

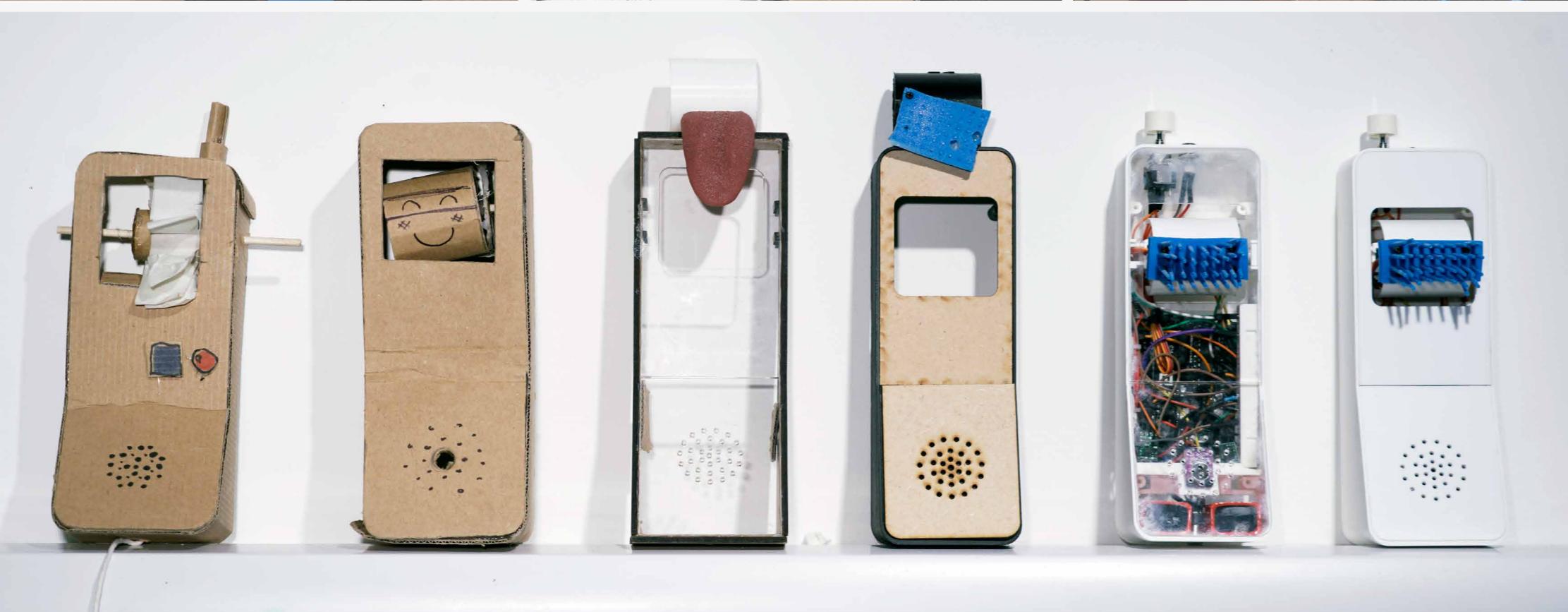
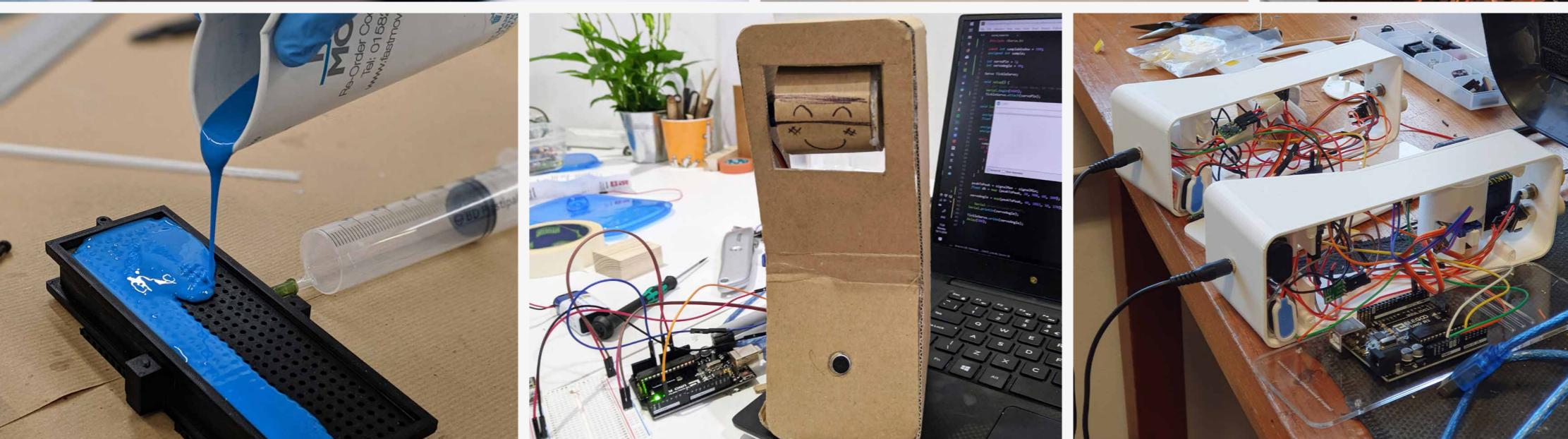
The pair of interactive devices is a **two-way system**. One device's microphone is connected to the other device's servo motor, controlling its roller and vice-versa. Enabled by an arduino board, the analogue signal measuring the loudness (in dB level) as captured by the microphone is converted to the digital actuation of the servo motor. Two batteries are used to power the motor and the microphone separately to reduce signal interference.

Feel the conversation.

Design Decisions

A number of prototypes have been created to iterate on the mechanical and electronic design of the system as well as to create an interesting physical interactive experience.

Different materials have been tested for the rolling feeler, such as feather, soft fabric and leather. Biocompatible silicone is chosen for hygienic reasons.



Feel the conversation.



brightside

BrightSide is the first communication tool for parents with fibromyalgia that focuses on the social aspect of pain management, and introduces a novel approach to how families talk about chronic illness.



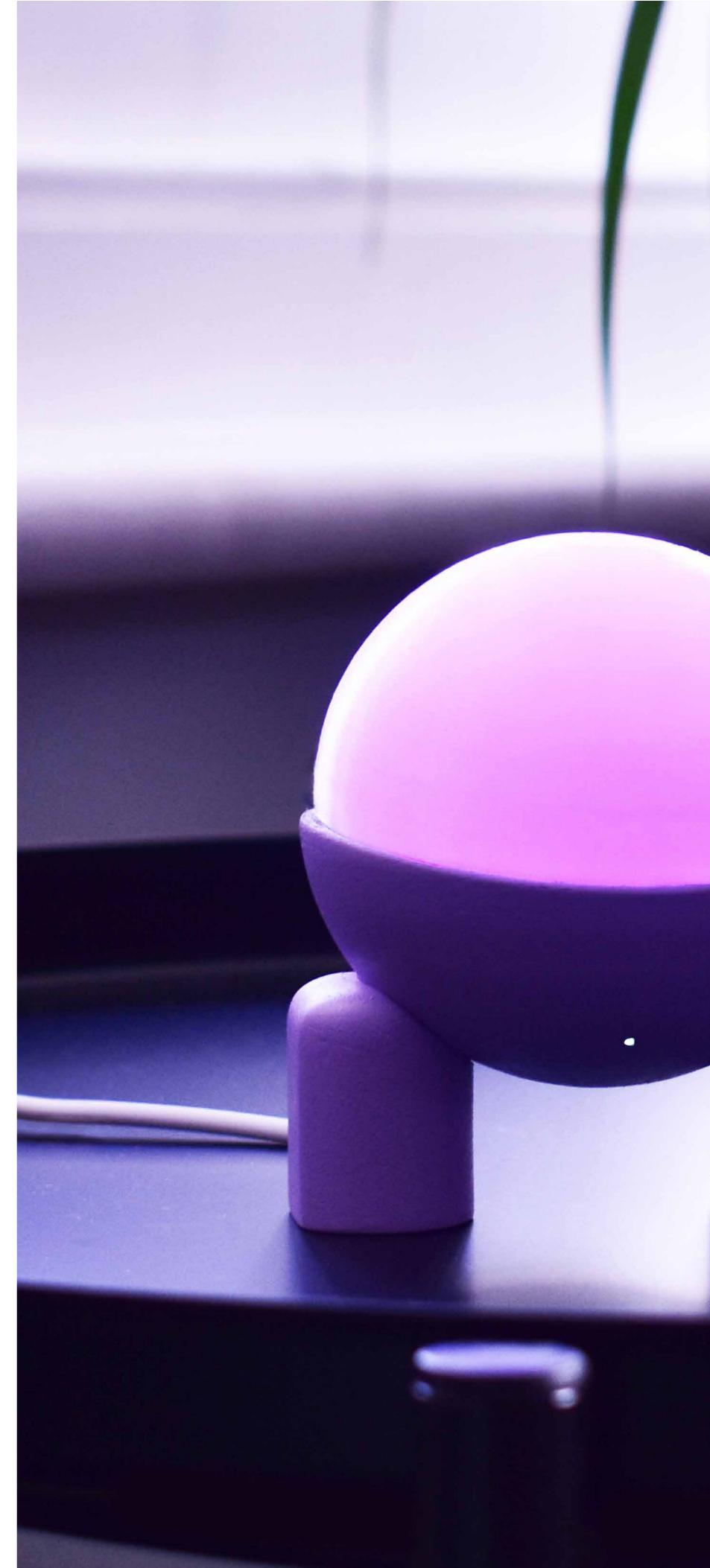
Scan the QR Code or click on the picture to learn more about BrightSide.

The project has been selected for 2021 EIT (European Institute of Innovation & Technology) Health Wild Card venture accelerator programme.

Inclusive Design

2020.09 - 2020.12

Group of four





An estimated 2 to 4% of the worldwide population suffers from Fibromyalgia. It is a chronic condition that causes widespread pain and severe fatigue, that has no cure and no explainable onset. Being a parent with fibromyalgia is extremely difficult especially when it comes to communicating their state to their children.

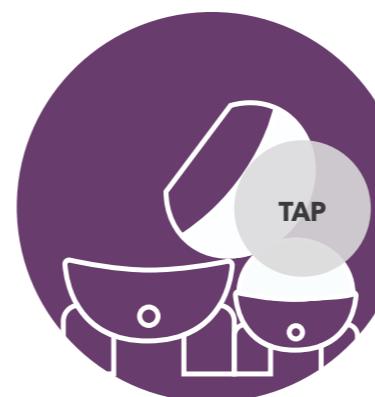
This is why we created BrightSide, to make it easier for loved ones to understand how their family member is feeling and be **supportive** along their journey.



Record the message for the kid

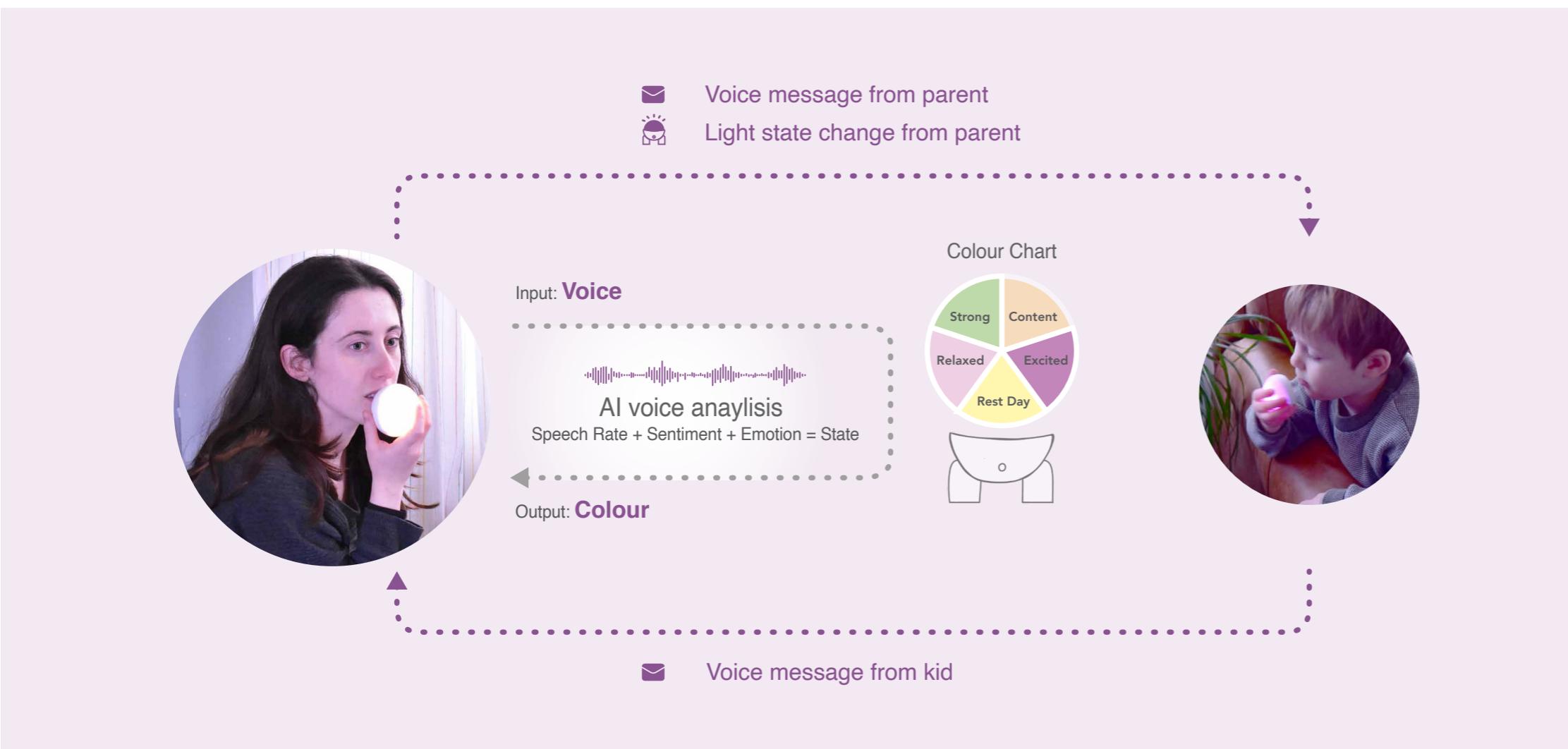


Shine the colour that represents parent's state



Tap to transfer the message and state

BrightSide is designed to facilitate an **asynchronous communication** routine where the parents can record a message for their children whenever they feel physically able. Parents record messages that are analysed through voice-based analytics and natural language processing to determine fatigue and emotional state. Once analysed, their state is conveyed through a simple **colour system** for the children to understand.

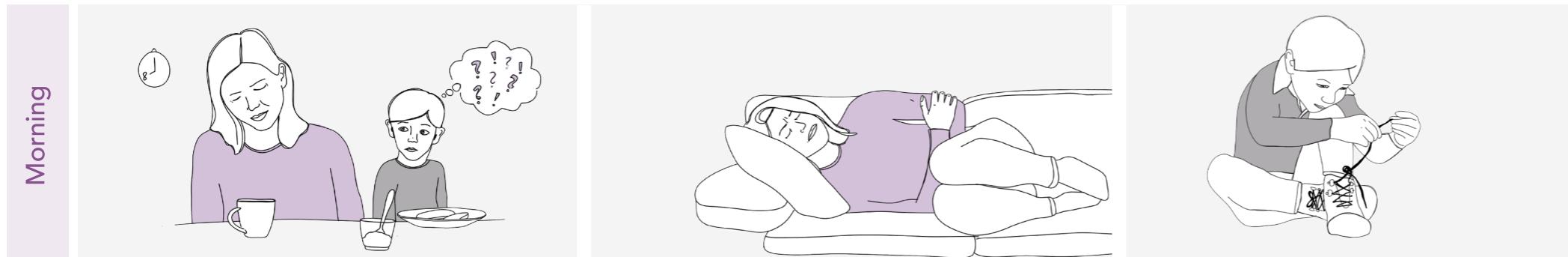


"My son grew apart from me. He was angry about the situation."
— J.Y fibromum interview

"I find it important for her to know that I'm okay, even when my pain is worse. I want her to be carefree."
— T.M. fibromum interview

User Journey

Mum wakes up very fatigued in the morning, and her kid goes off to school concerned.



Over the course of their day, the mum might feel better, but is unable to communicate it to her child while he's at school. This is when she can use BrightSide to record a short message, highlighting the bright side of her day.

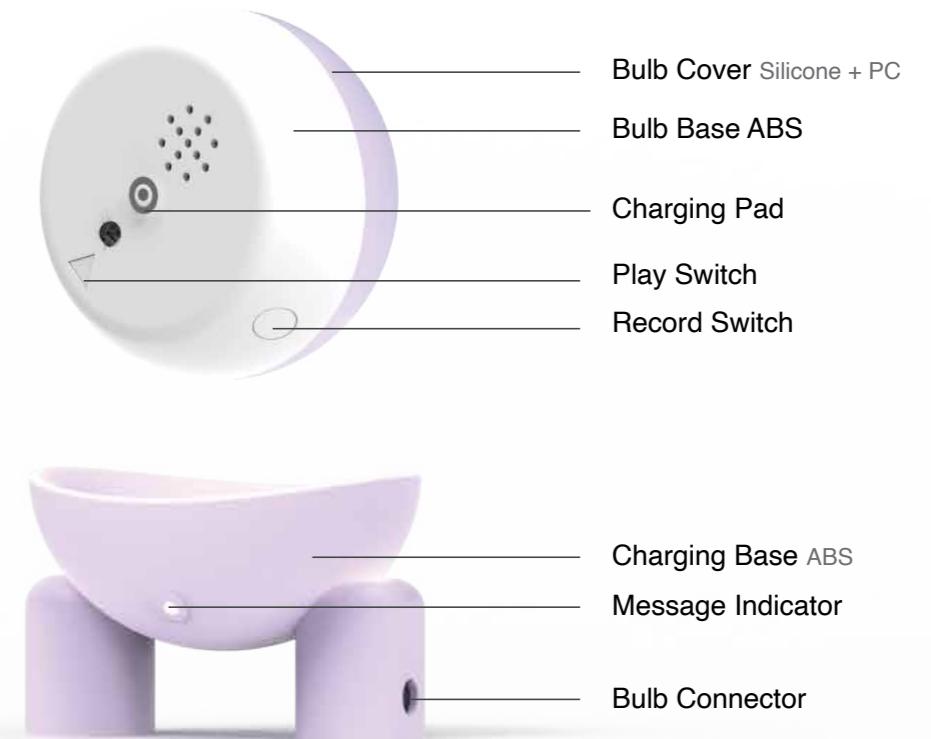
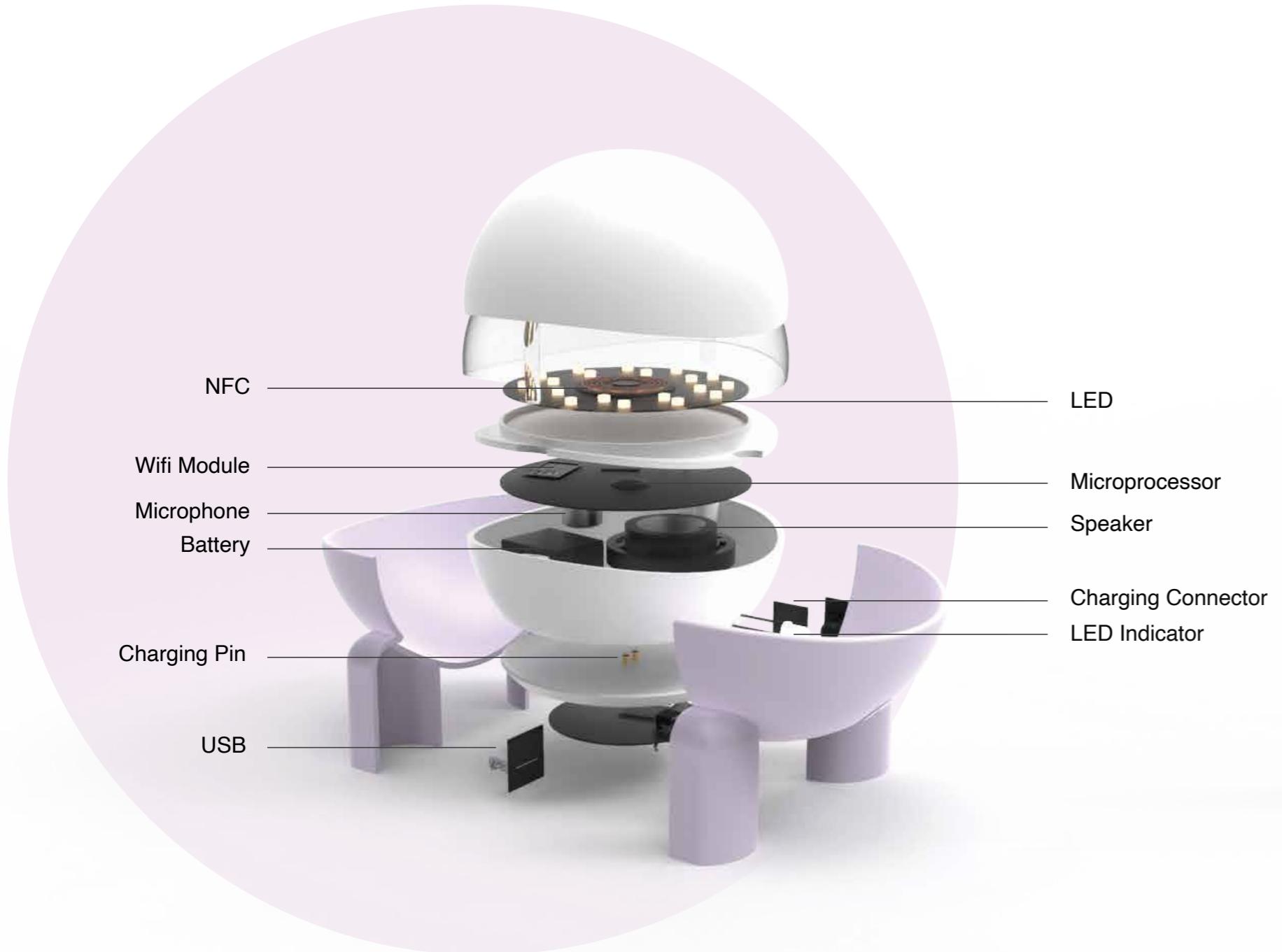


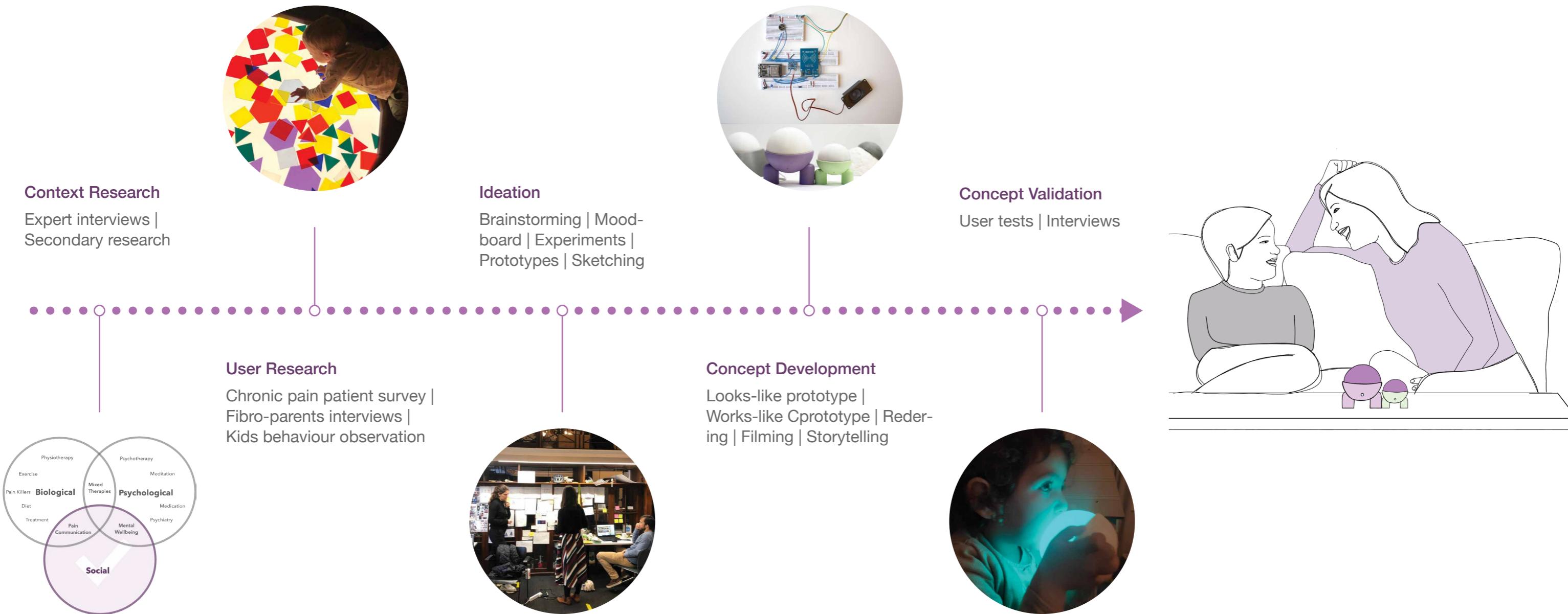
When the child is back home he sees today's colour glowing that represents mum's physical and emotional state, and a blinking message notification. He then listens to the message, which will spark a conversation and give him a better understanding of how she's feeling, closing the communication gap.



By using BrightSide a parent can establish a communication ritual that will help them overcome the barrier of speaking about their condition with their children. The interaction will establish a family conversation routine about parents' symptoms and efforts of getting better. This will reduce stress levels associated with fibromyalgia along with **uncertainties** for both parent and child, helping normalise the condition by shining a light on their daily life.

Each device consists of two parts: the bulb contains a speaker, a microphone, LEDs, a microprocessor and a Wi-Fi module; the base is the charger.









COMET is a passenger vehicle inspired by quadrotor drone, using a hydraulic propulsion system to obtain a battery life up to three hours, compared to 15 min of similar structures.

In collaboration with the Department of Mechanical Systems of UTC, I proposed and designed the physical structure of this passenger drone.



Scan the QR Code or click on the picture to see a full sized physical realisation.

Industrial Designer

2017 Summer

Freelance





By introducing design elements from **automotive industry**, the passenger drone inspires confidence and familiarity for passengers in this novel mode of individual transportation.

Provided with a basic set of technical constraints, I set out to rethink what individual transportation would look like in the air.

The design of COMET strives first and foremost for **individuality** and **agility**, underlined by its streamlined body and aerodynamic design that emphasize maneuverability and precision.

3D technical specification

Benchmarking (aircraft, automobile, drone, animals, etc.)

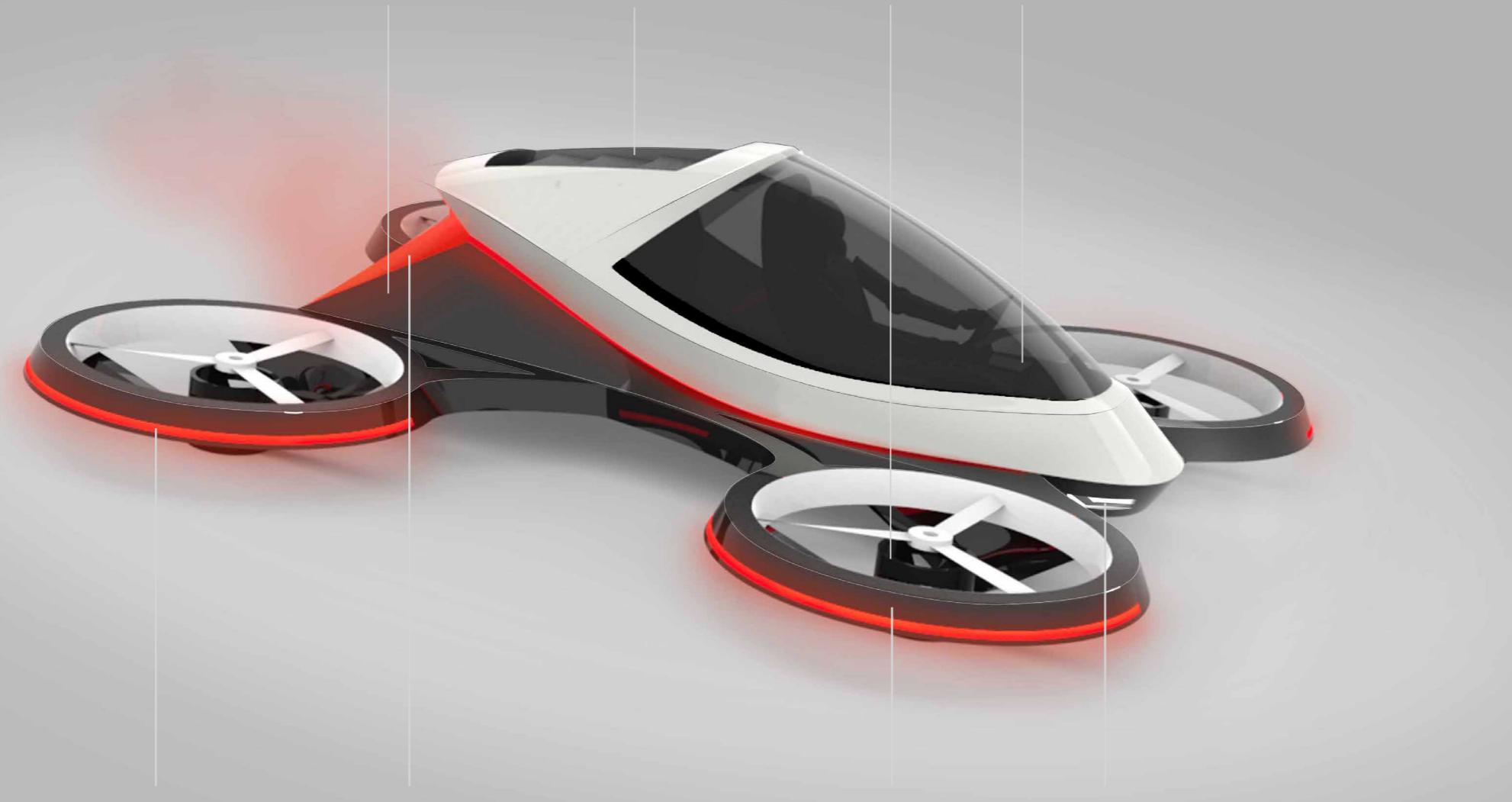
Sketching

3D Modeling



Function

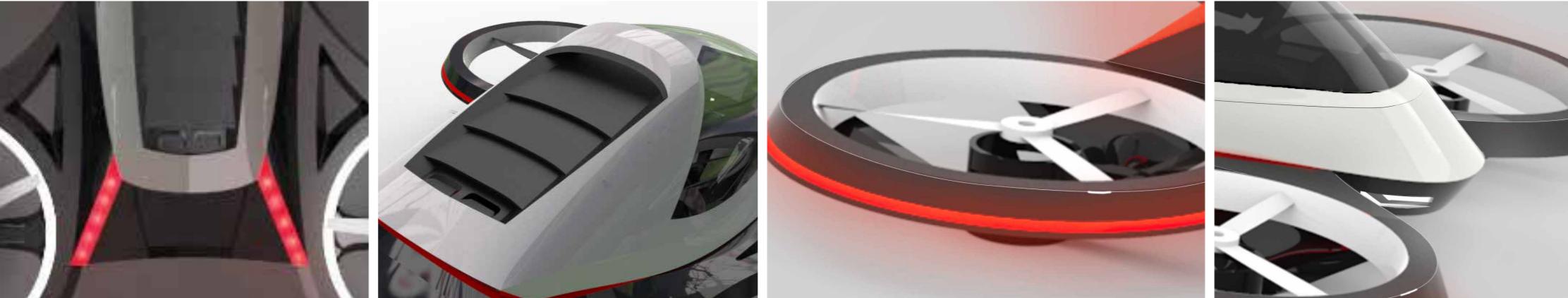
Compartment for hydraulic propulsion system Radiator grille Engine support and wire passage Cockpit



Safety

Blinkers Rear lights

Propeller protections Headlights



COMET induces a sense of **safety** and **familiarity** by borrowing safety design elements from modern supercars.

Rethinking transportation in 3D also means taking into account novel safety considerations: visual signaling should be visible from different angles, which is why the front and rear lights are sloped to convey the driver's intention to other commuters.



Sensorwake

Redesign

SensorWake challenges the most intimate aspect of our everyday life: how do we wake up in the morning? Instead of the anxiety-inducing noise that we are all too familiar with, SensorWake uses scent to gently wake you up.

During a student project, I proposed to redesign this olfactory alarm clock for a more gentle, intuitive and intimate wakeup.



Industrial Designer

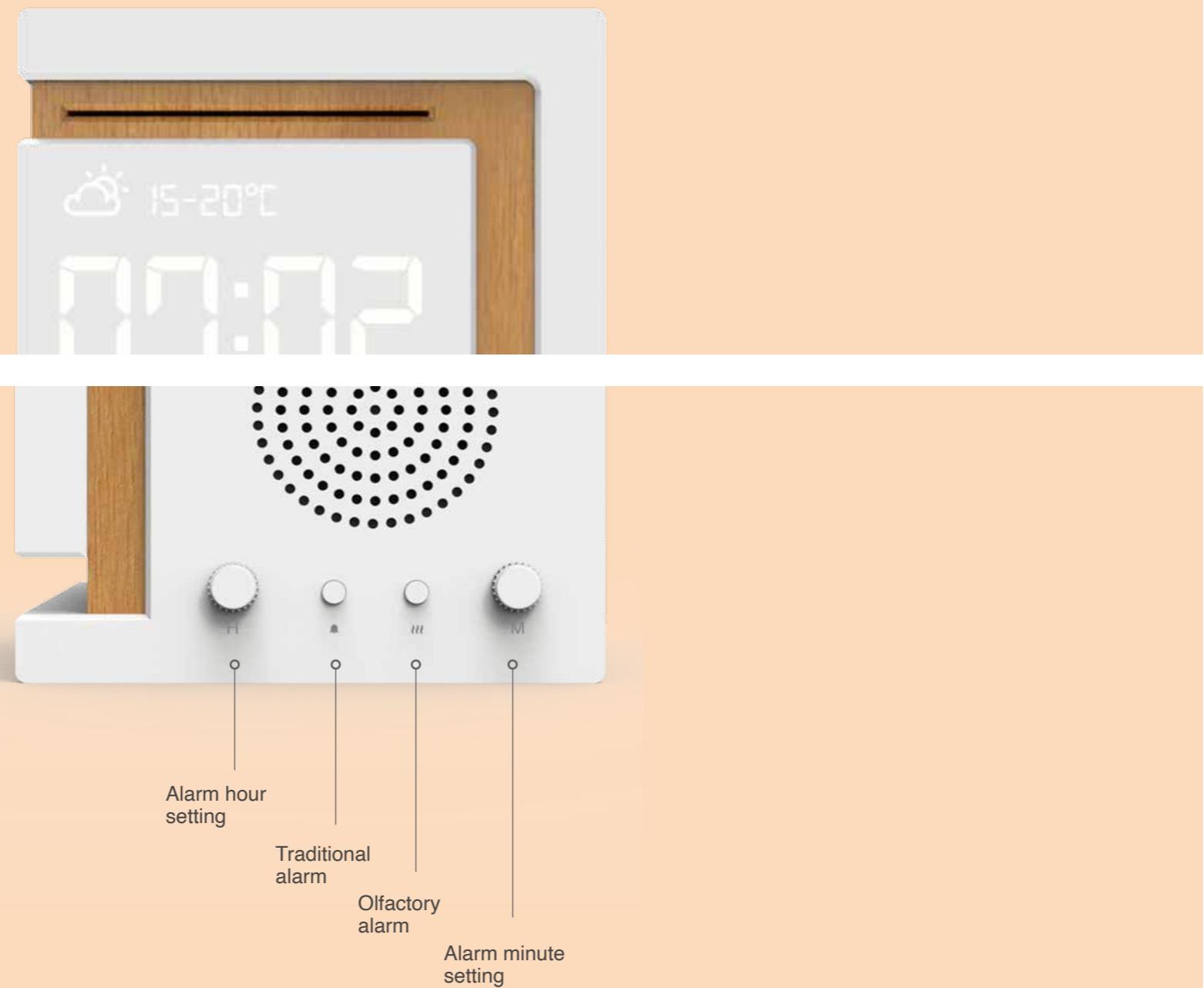
2015 Spring

Student project (in pair)

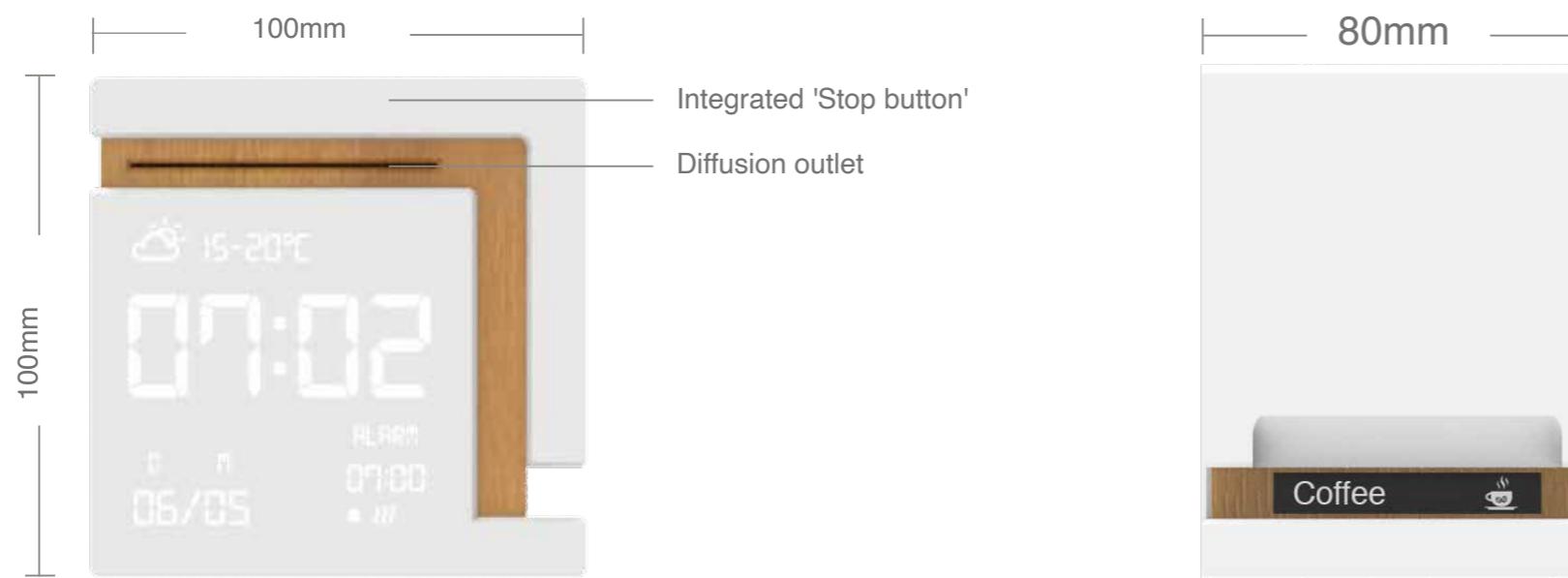
Designing an object that's always present in users' bedrooms is a significant challenge for designers: its visual appearance, texture and interface need to be gentle, assuring and nonintrusive.

The **wooden diffuser** blends in naturally in bedroom setting. The **pressure-sensitive top** retains a familiar "snoozing" interface that's made even more intuitive by blocking the scent outlet physically when pressed down.

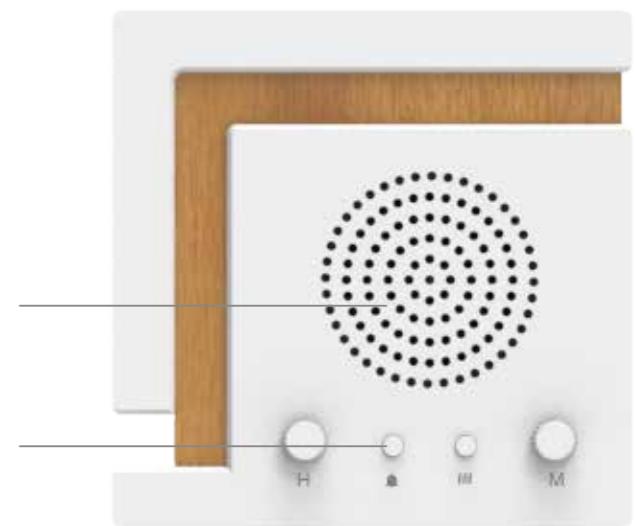
In addition to the built-in bluetooth module, SensorWake retains a **physical dial-based setting interface** that is easy to navigate and emphasize the basic function of the product.



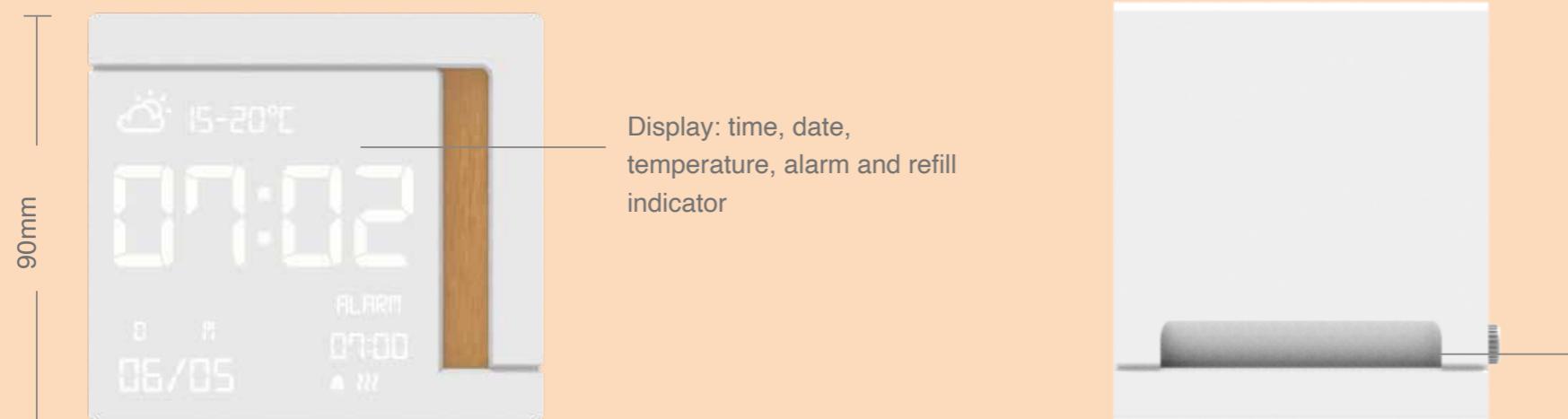
Olfactory alarm on



Ventilation
Alarm mode button (olfactory or sound)



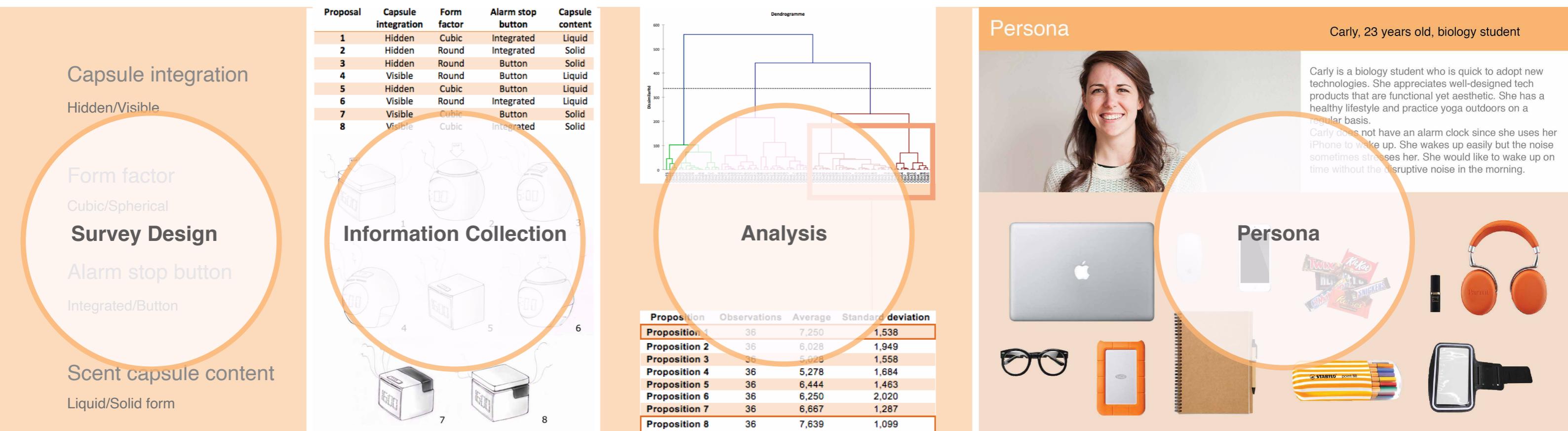
Olfactory alarm off



Opening groove
(scent capsule is hidden when olfactory alarm is off)



For this design project, I carried out user studies in order to objectively evaluate user preferences on the design of this product. The sequence below illustrates this process, where I performed statistical analysis, which led to the draft sketch for the final design.





Parrot Drone accessories

Parrot is a leading wireless products manufacturer, specialized in consumer drones.

During my time at Parrot, I participated in the design of a series of accessories to make drone piloting more playful, including a parrot figurine, 2 connected accessories adapted to the connection brick of new range of MiniDrones. I also proposed design for a gimbal, a charger and 2 drones.

Industrial Designer & Mechanical Engineer

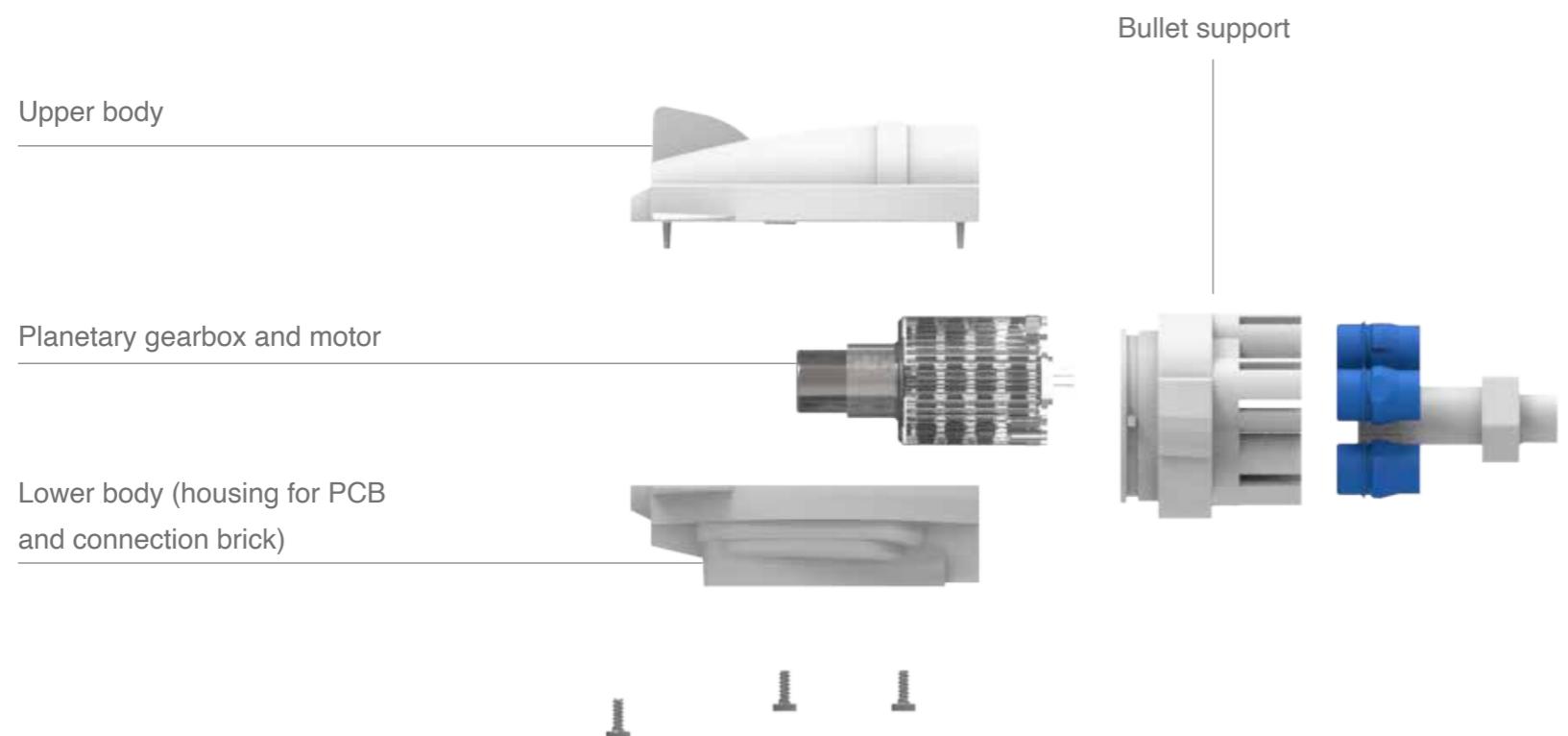
2016.9 - 2017.7

Internship

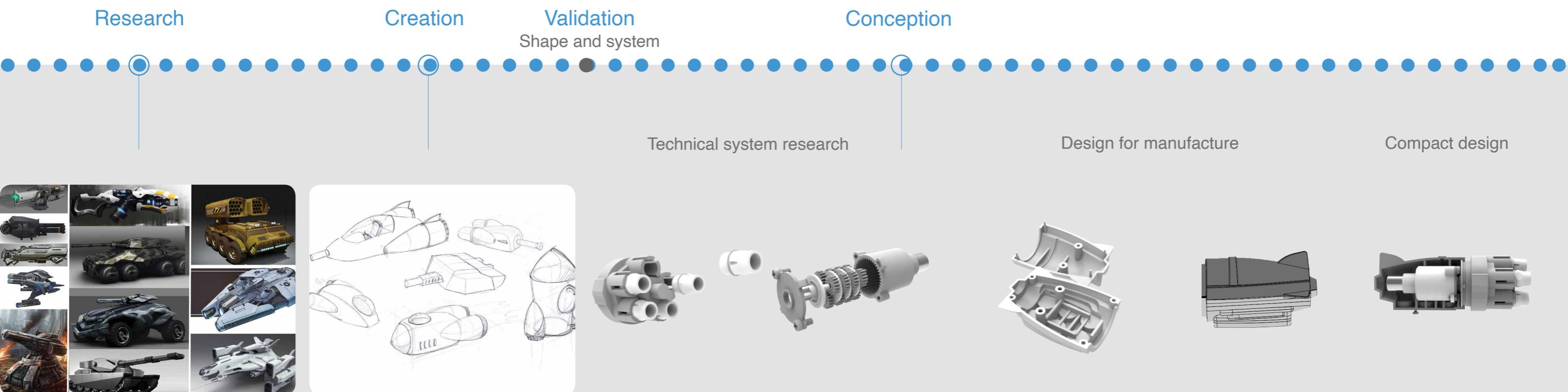


Parrot

Accessories - Design Cycle

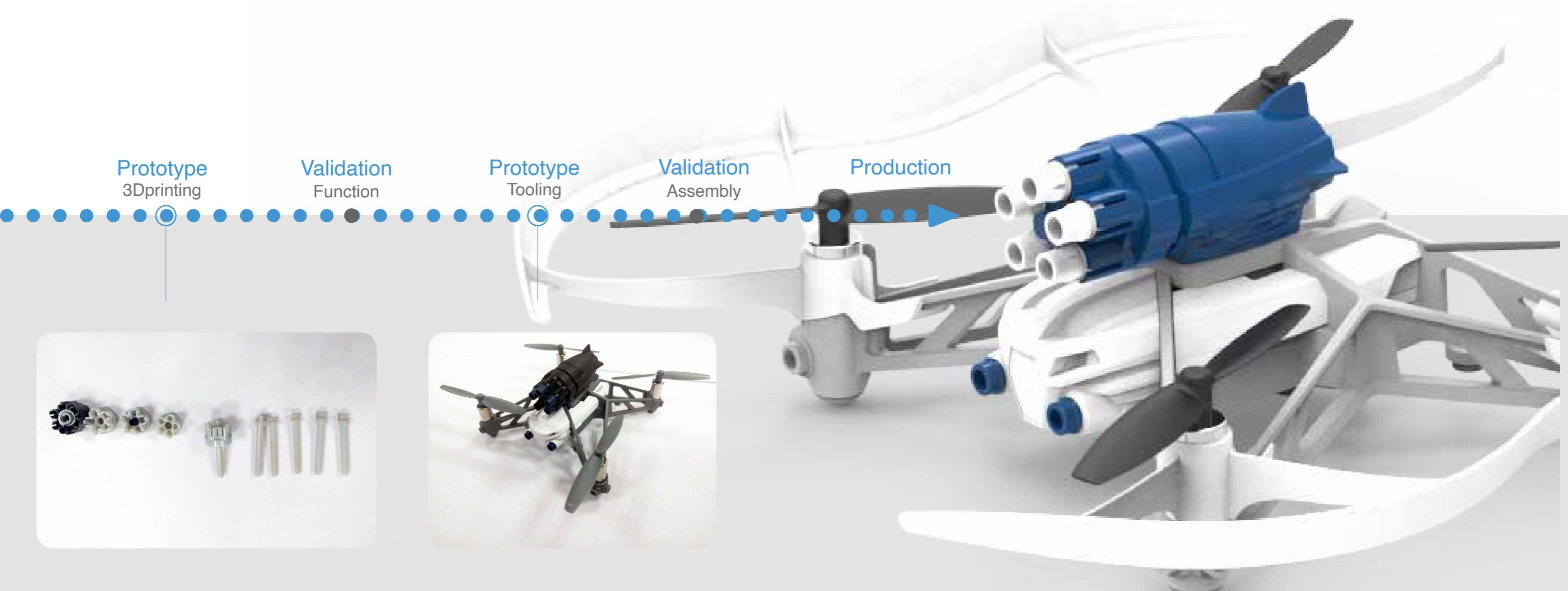


The design of accessories began with shape and technical system benchmarks, followed by 3D modeling. 3D printing prototypes have been used to adjust dimensions and correct design flaws. CNC parts and injection molds have been launched to obtain more precise parts with real material to test products' functionalities.



The accessories possess streamlined curves while keeping a geometric and technical aspect to match the range of products.

The plastic parts are designed to respect manufacture constraints as well as weight constraint which is important for drone design.



Parrot



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