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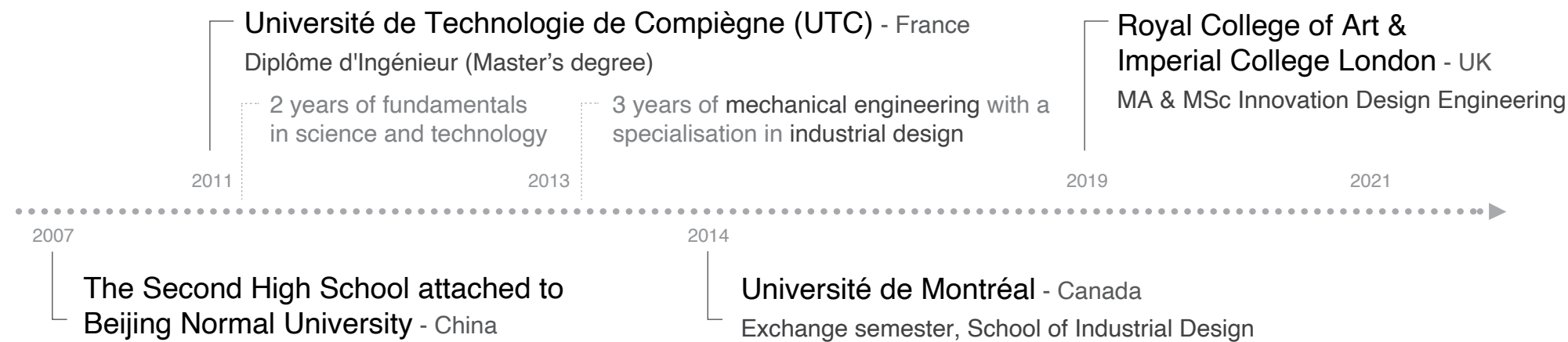
T F

L I



cestxianzhi@gmail.com  
xz-zhang.com

## Education



## Experiences

### Withings - Lead Mechanical Design Engineer

Oct. 2016 - Jul. 2019

- Delivered two connected healthcare devices (rated 4.4/5, 843 Google reviews):
  - BPM Core: CES Innovation Awards 2019, distributed in Apple stores globally [\[link\]](#)
  - BPM Connect: distributed in Apple stores globally and Walmart in the US [\[link\]](#)
- Led entire product cycles from research, mechanical design, prototyping, production, product testing to product launch.

### EIT Health Wild Card - Finalist

Jun. 2021 - Present

- One of the 4 finalists in the pain management challenge organised by the European Institute of Innovation & Technology venture incubator.
- Defined business model and value proposition through extensive user research (patients and healthcare professionals).

### TANGIO LTD - Production Engineering Consultant

Aug. 2020 - Sep. 2020

Consulted for production challenges of 2 consumer electronics, including product reliability testing, prototyping and design validation.

### Parrot Drone - Industrial Design Intern

Sept. 2015 - Jun. 2016

### Groupe Renault - Assistant Program Manager Intern

Feb. - Jul. 2014

# Xian-Zhi ZHANG

cestxianzhi@gmail.com  
xz-zhang.com

## 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

**English:** Professional Working Proficiency

**Chinese:** Native Speaker

**French:** Bilingual Proficiency

## Patent

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

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

## Press

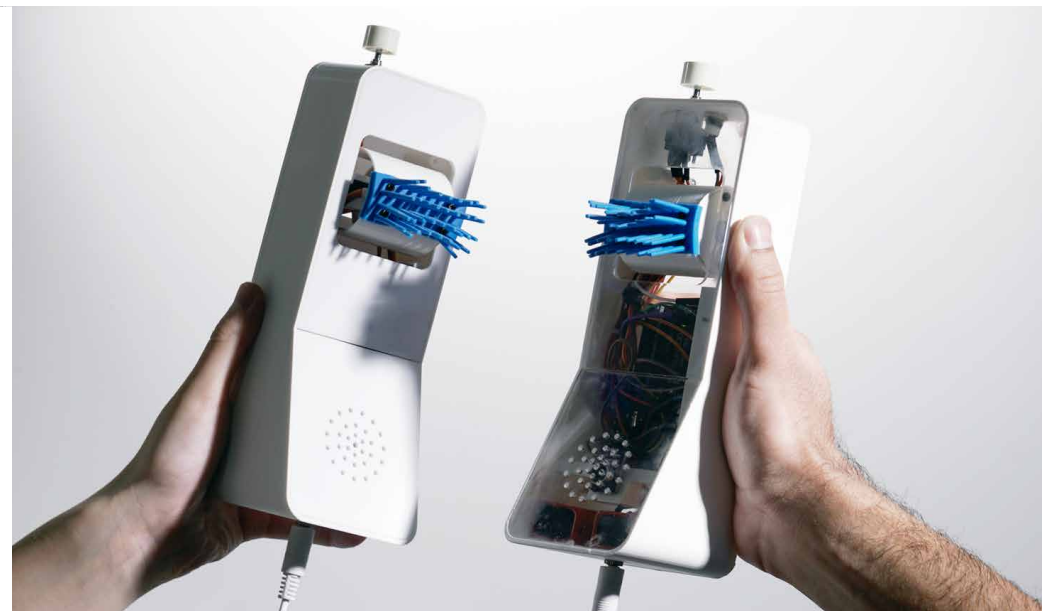
Dezeen [\[link\]](#) & Business Insider [\[link\]](#): RCA students design phones that turn speech into physical sensations

# Xian-Zhi ZHANG

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**Withings BPM Core & BPM Connect**  
Connected Health Monitors



**Feel the Conversation.**  
Haptic Interaction



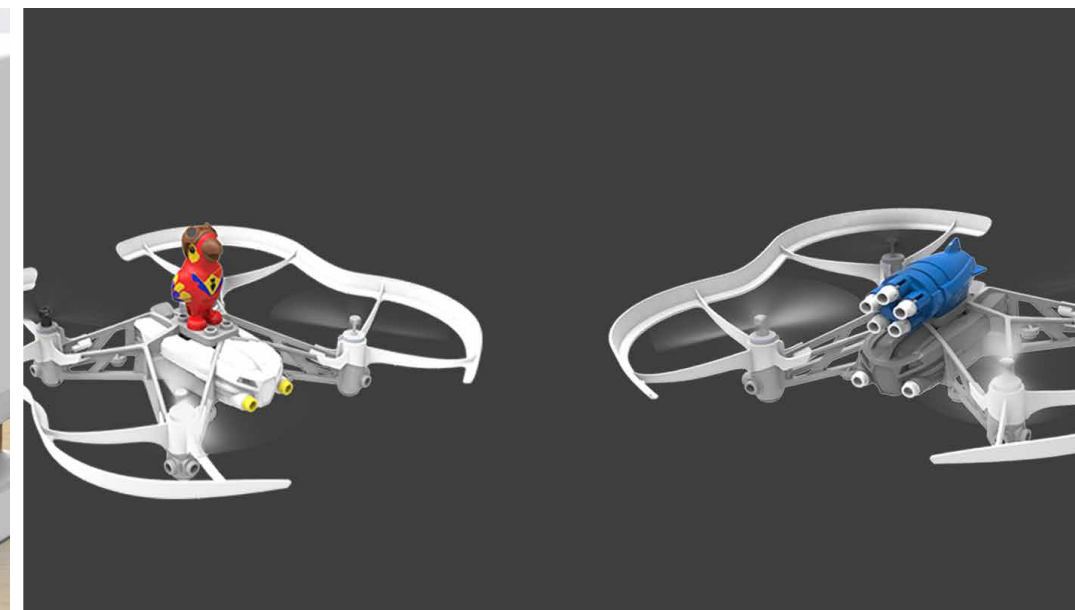
**BrightSide**  
Chronic Condition Communication



**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.

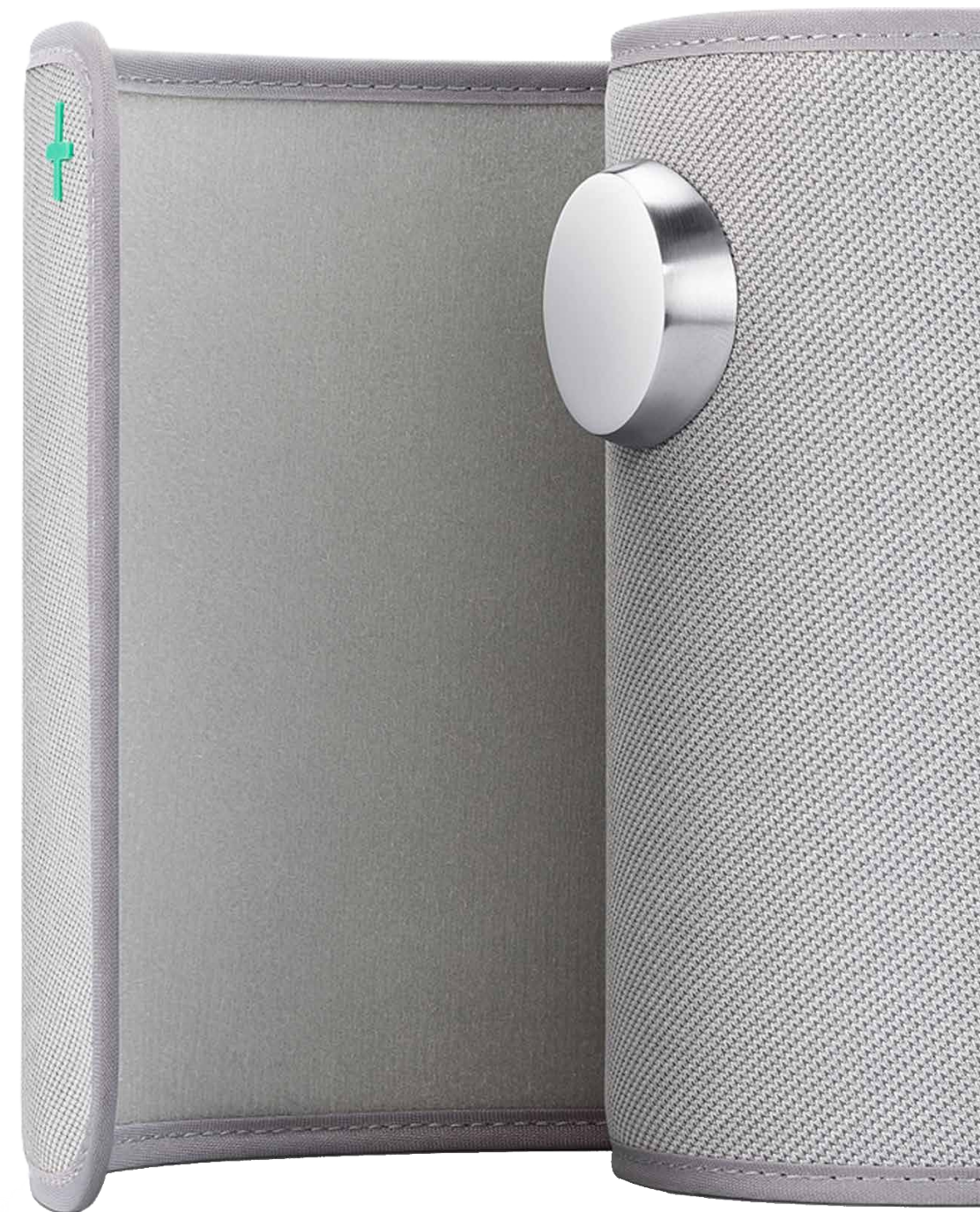


Scan the QR Code or click on the picture for more details.

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.

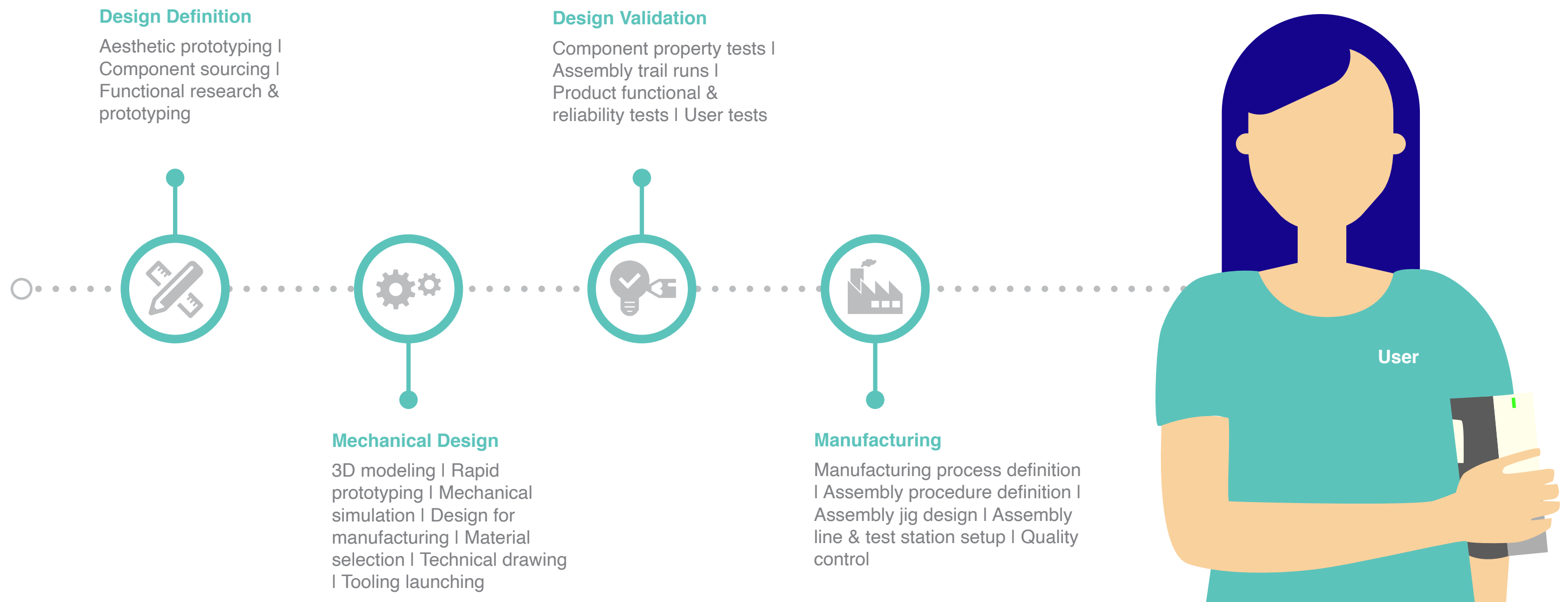


### Electrodes

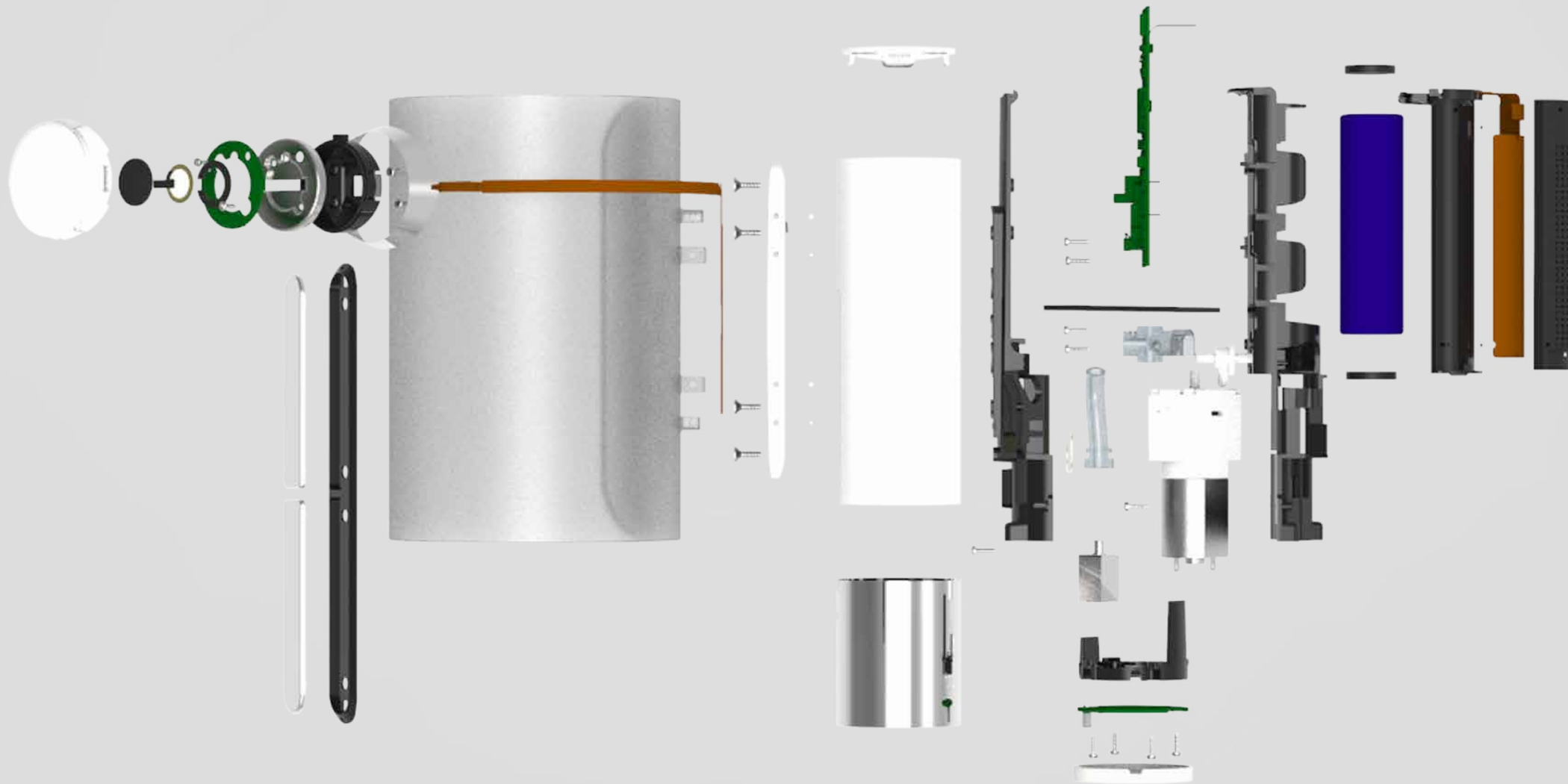
Detect **atrial fibrillation** - the most common form of arrhythmia that can lead to heart failures.



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



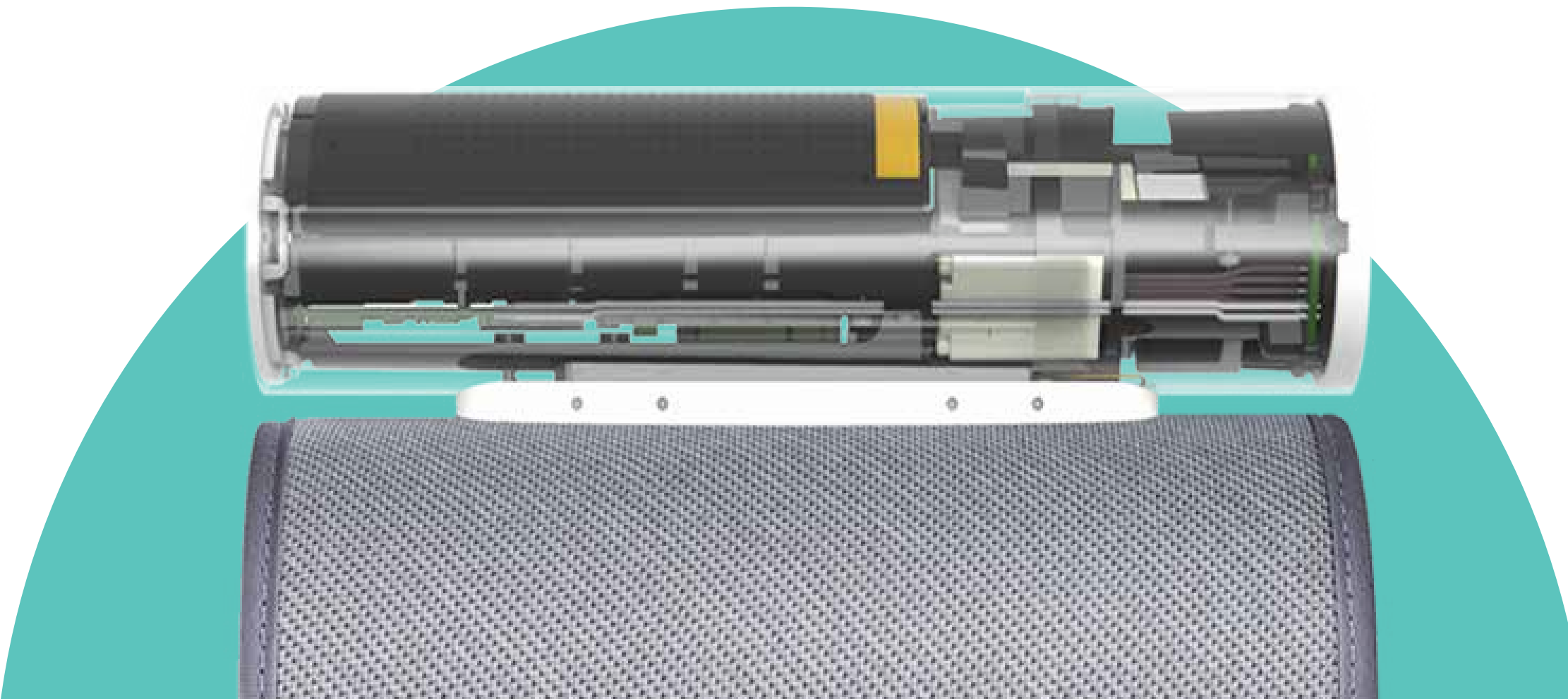
Cuff fabric with embedded metal electrodes that balance between aesthetics and signal accuracy



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





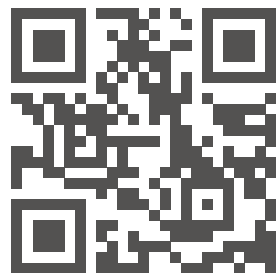


# WITHINGS

## BPM 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

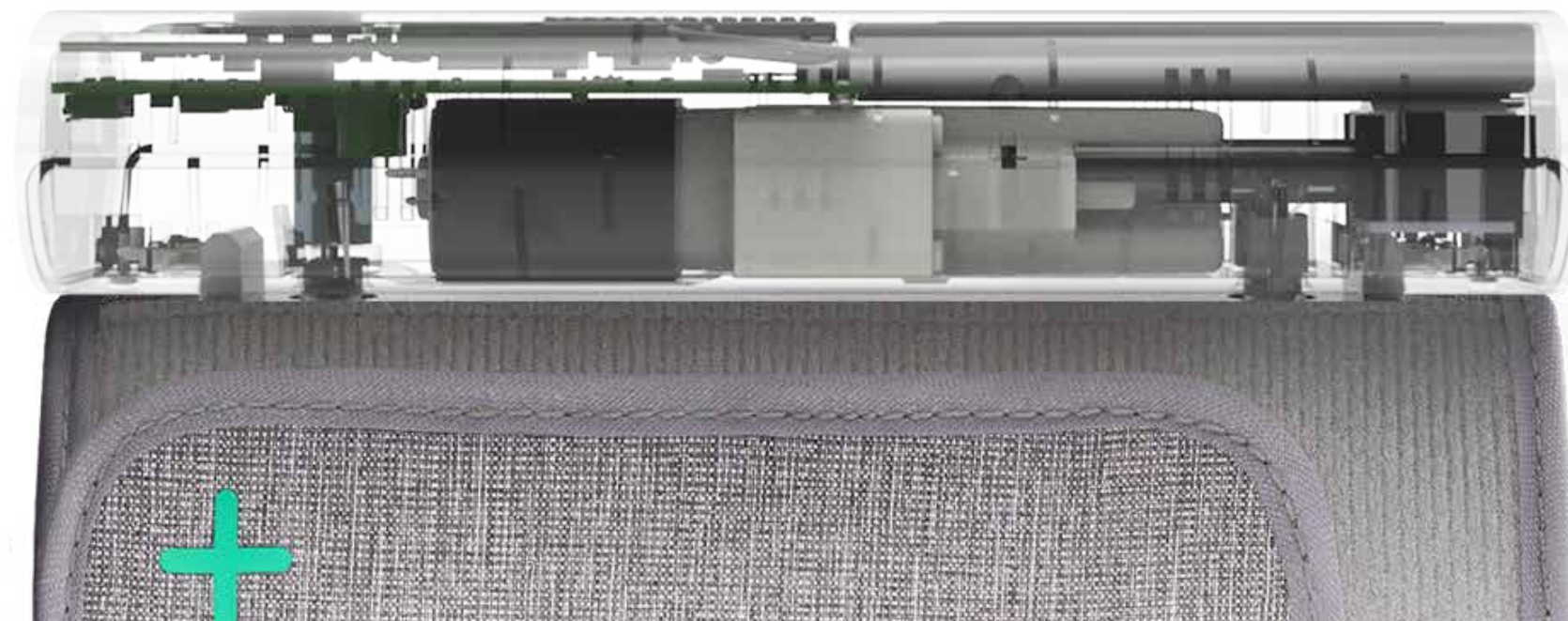
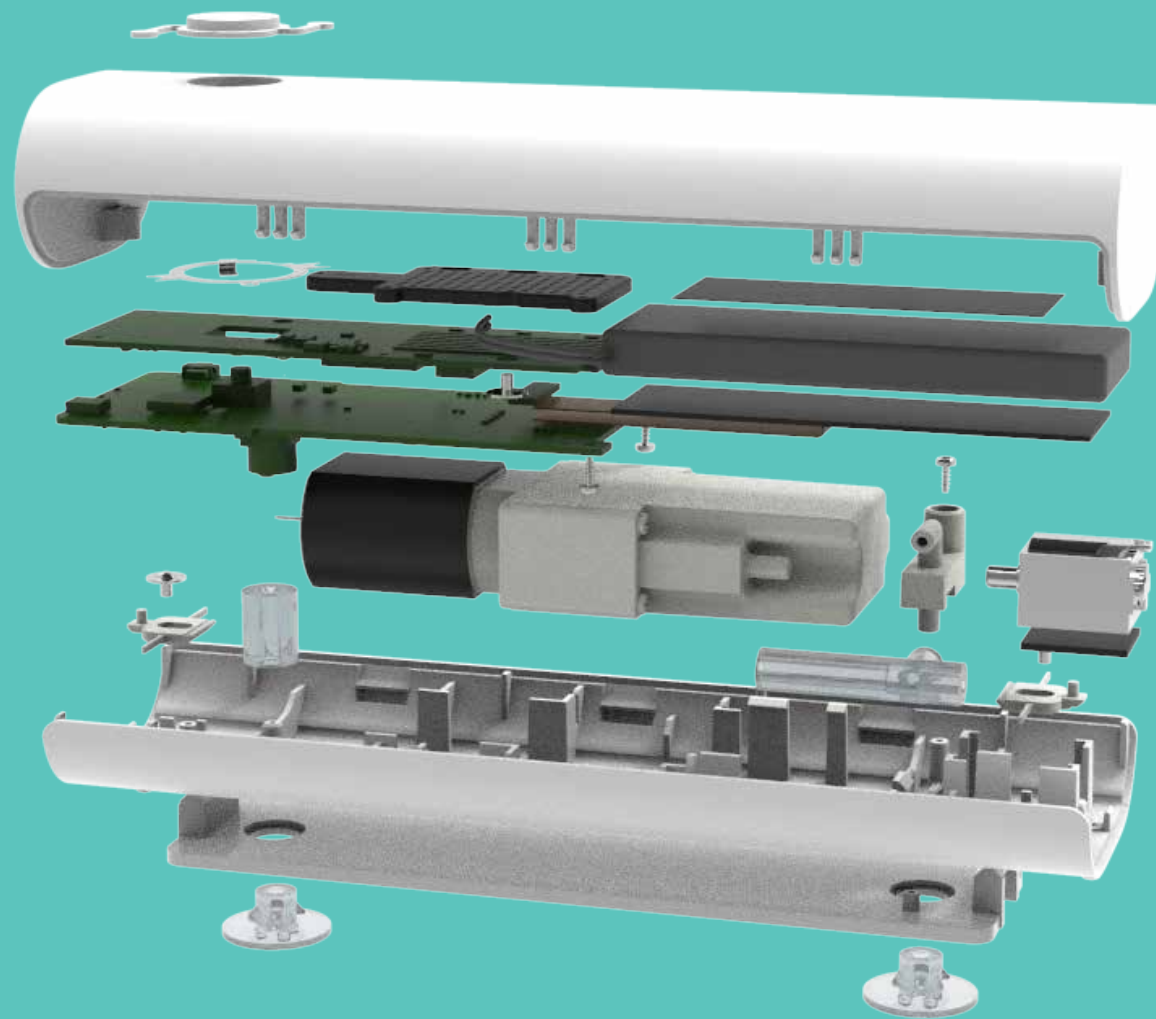
2018 - 2019





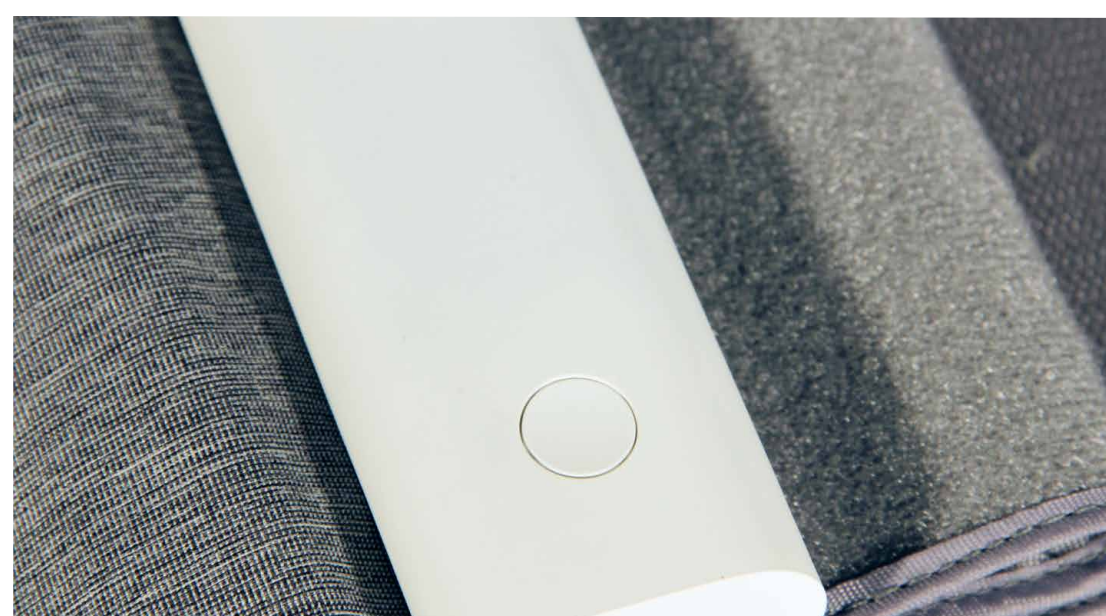
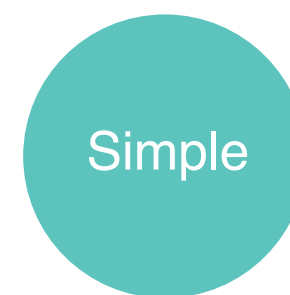
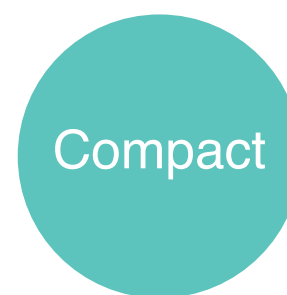
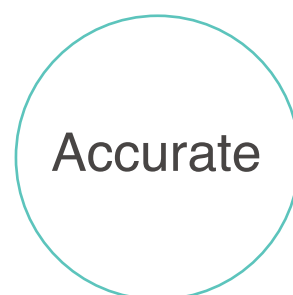
I accompanied BPM Connect over its full design-production cycle. I gained in-depth understanding of industrial design and manufacturing processes.

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)



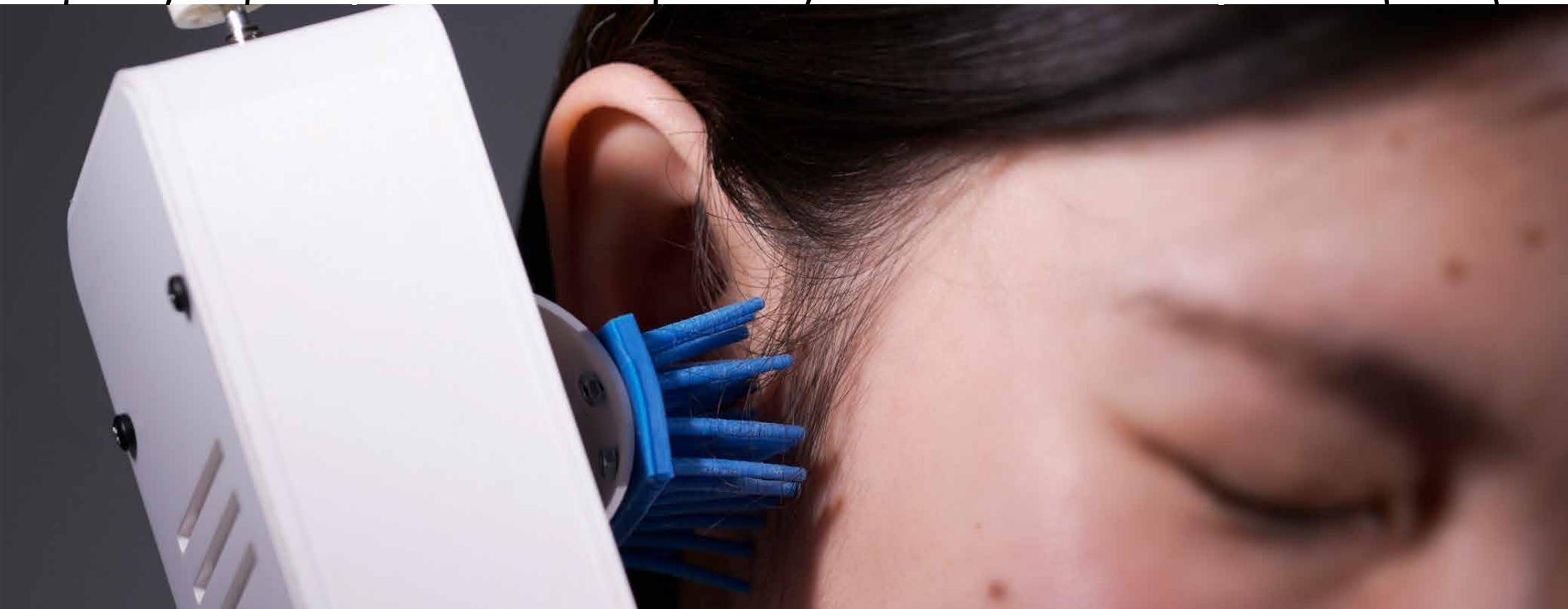
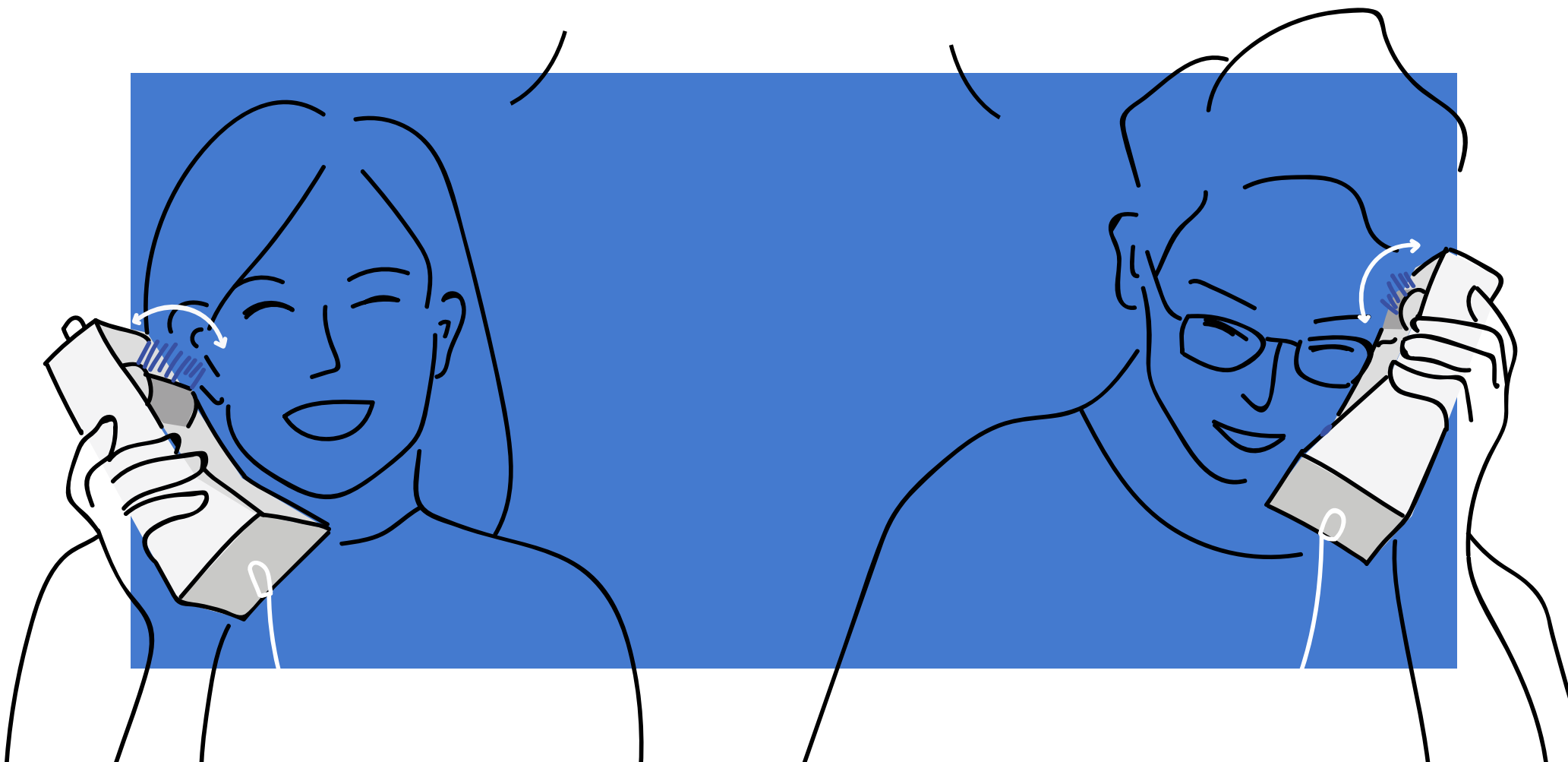
## Feel the conversation.

### Design Objectives

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.

嗨，最近怎么样？

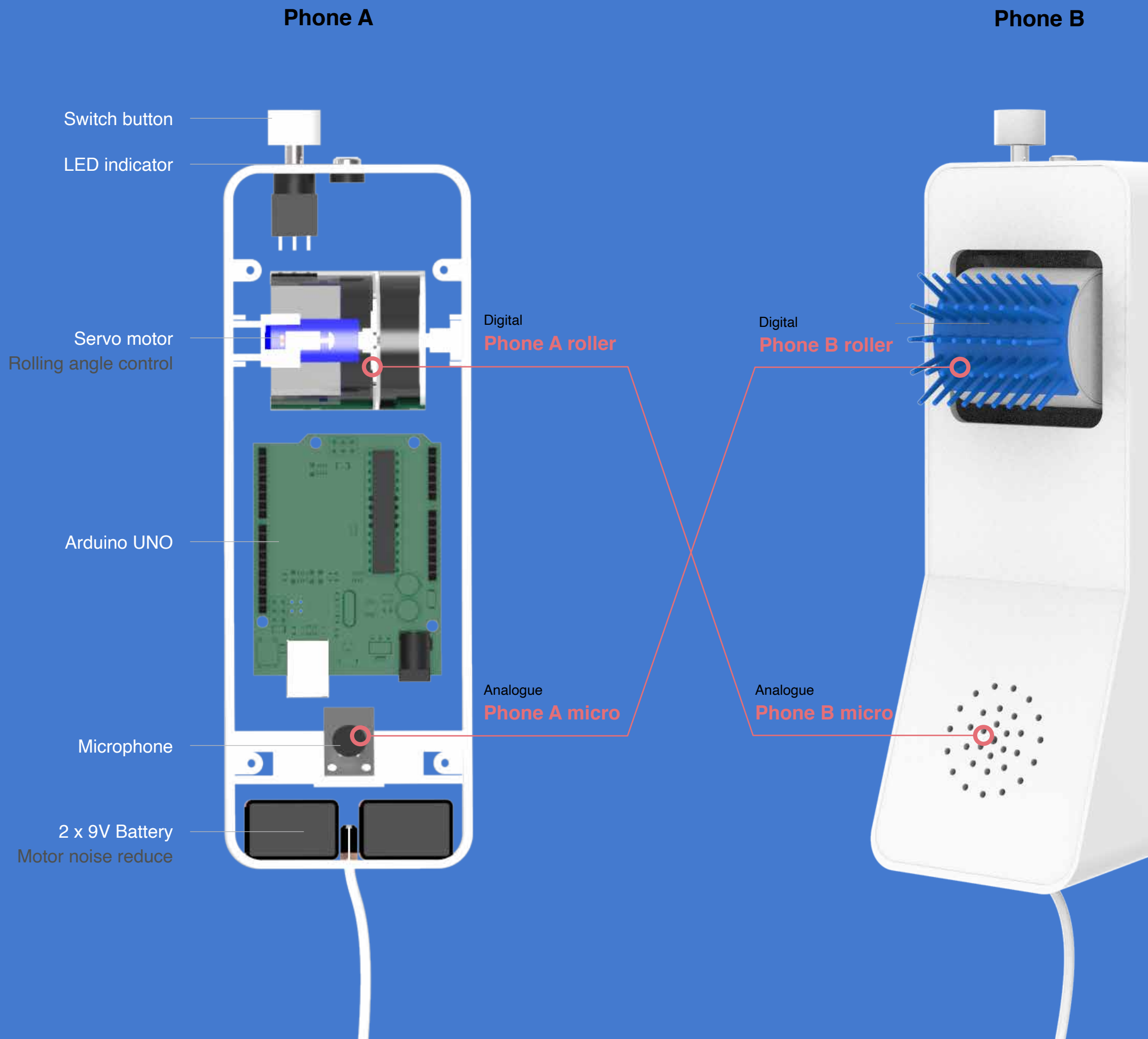
I'm fine, and you?



# 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.

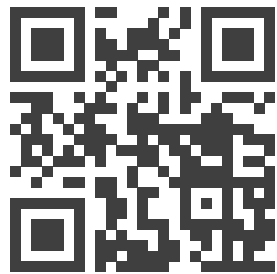


Feel the conversation.



# 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.



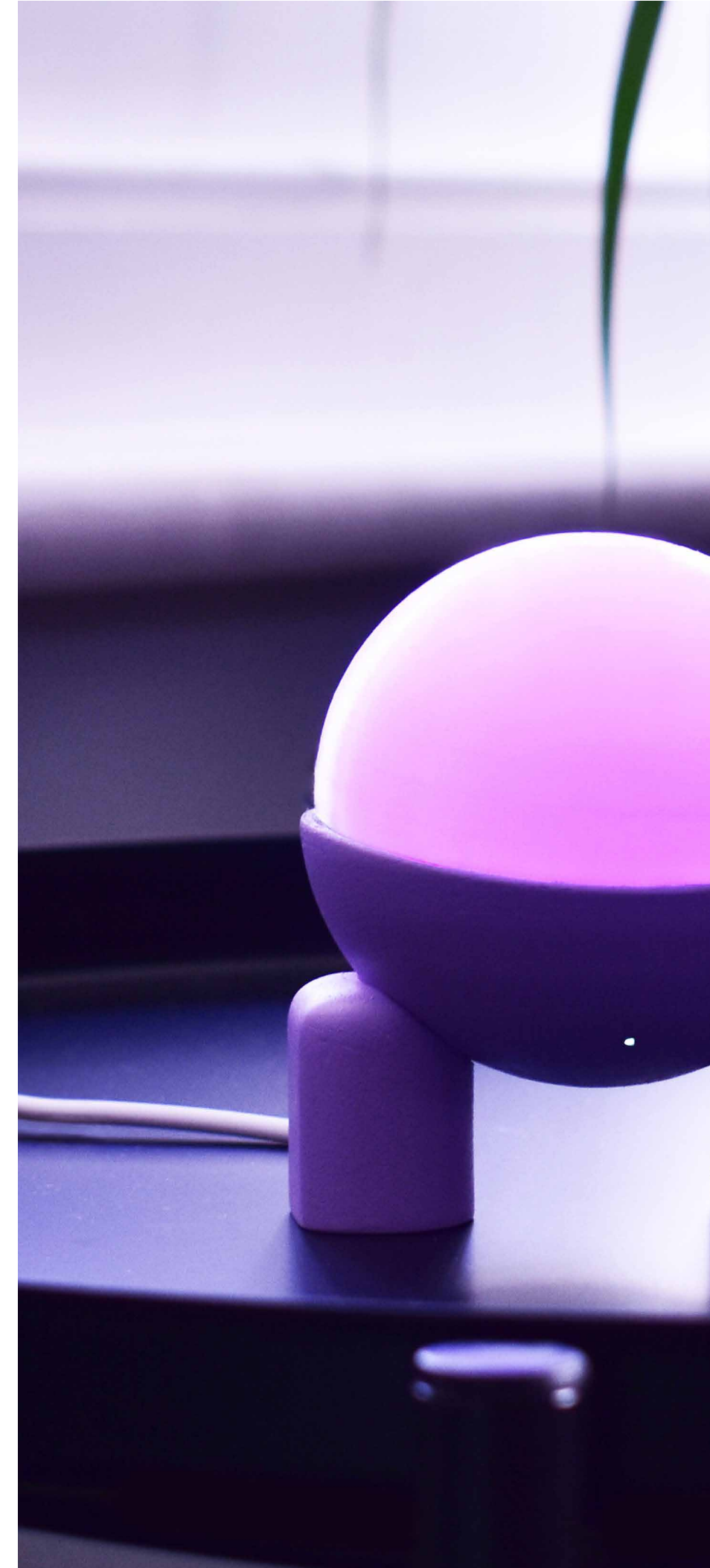
Scan the QR Code or click on the picture to learn more about BrightSide.

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.



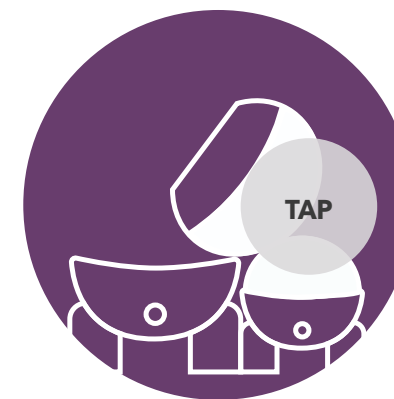




**Record the  
message for  
the kid**

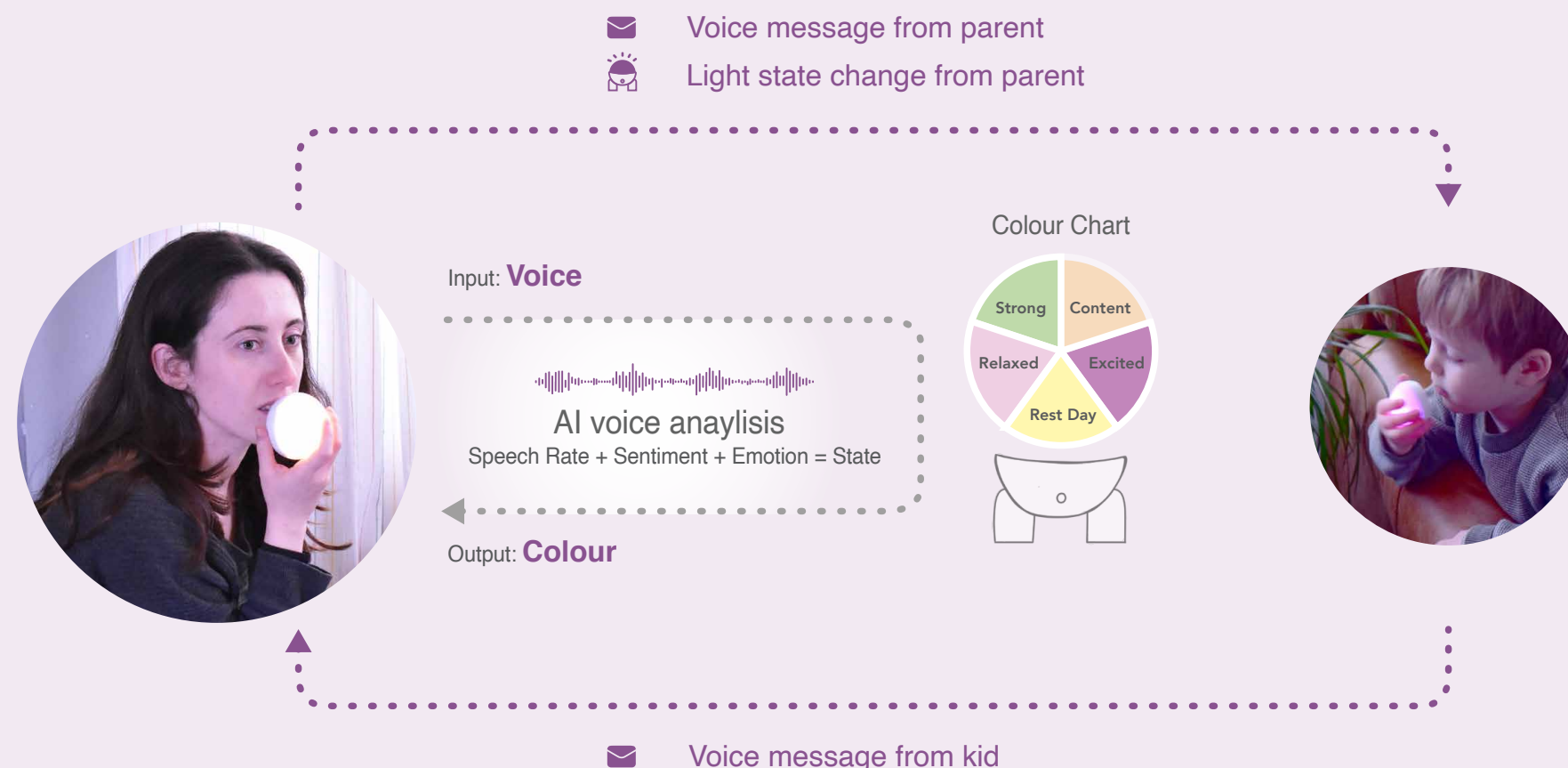


**Shine the colour  
that represents  
parent's state**



**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

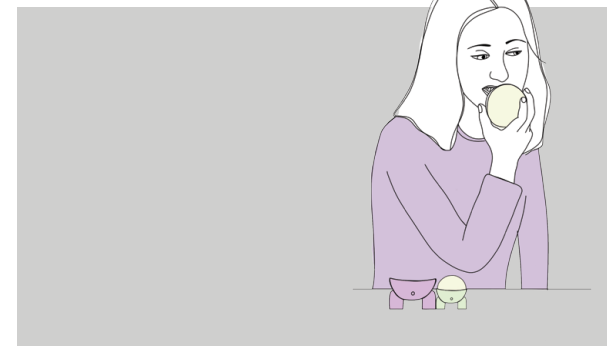
Mum wakes up very fatigued in the morning, and her kid goes off to school concerned.

Morning



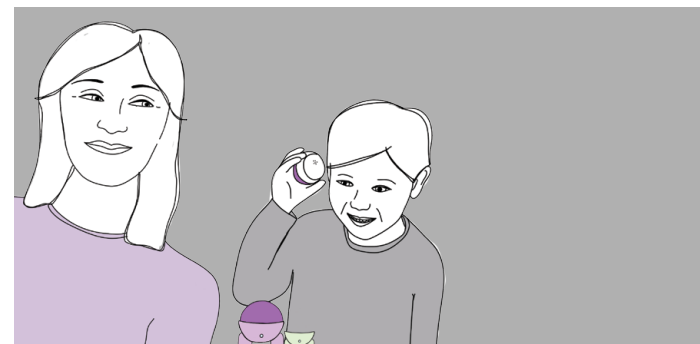
Over the course of their day, the mum might feel better, but is unable to communicate it to her child while he's at school. This is when she can use BrightSide to record a short message, highlighting the bright side of her day.

During the 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.

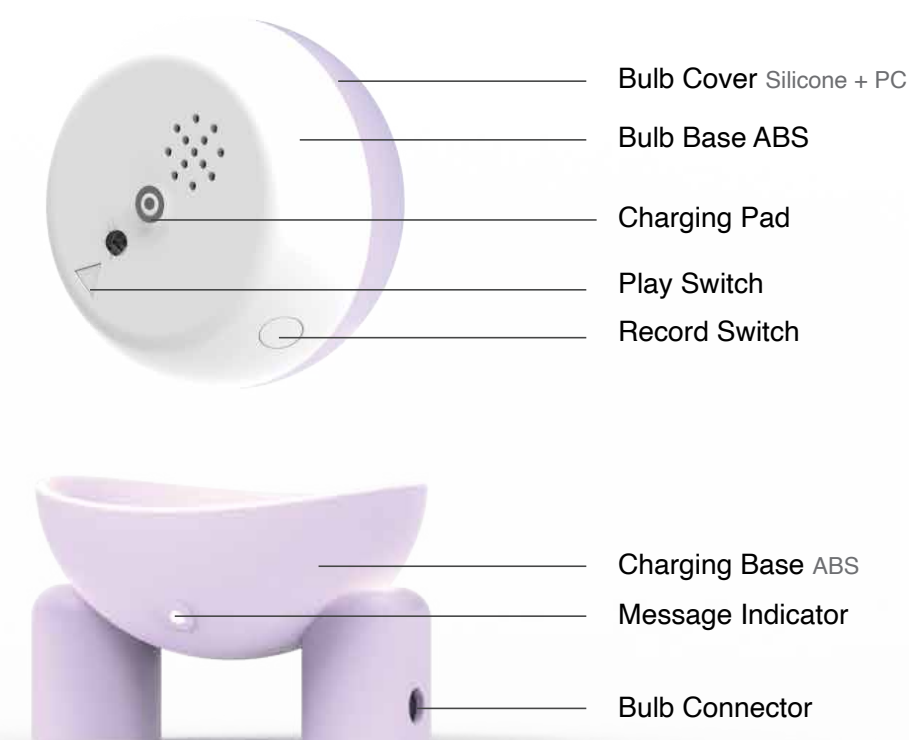
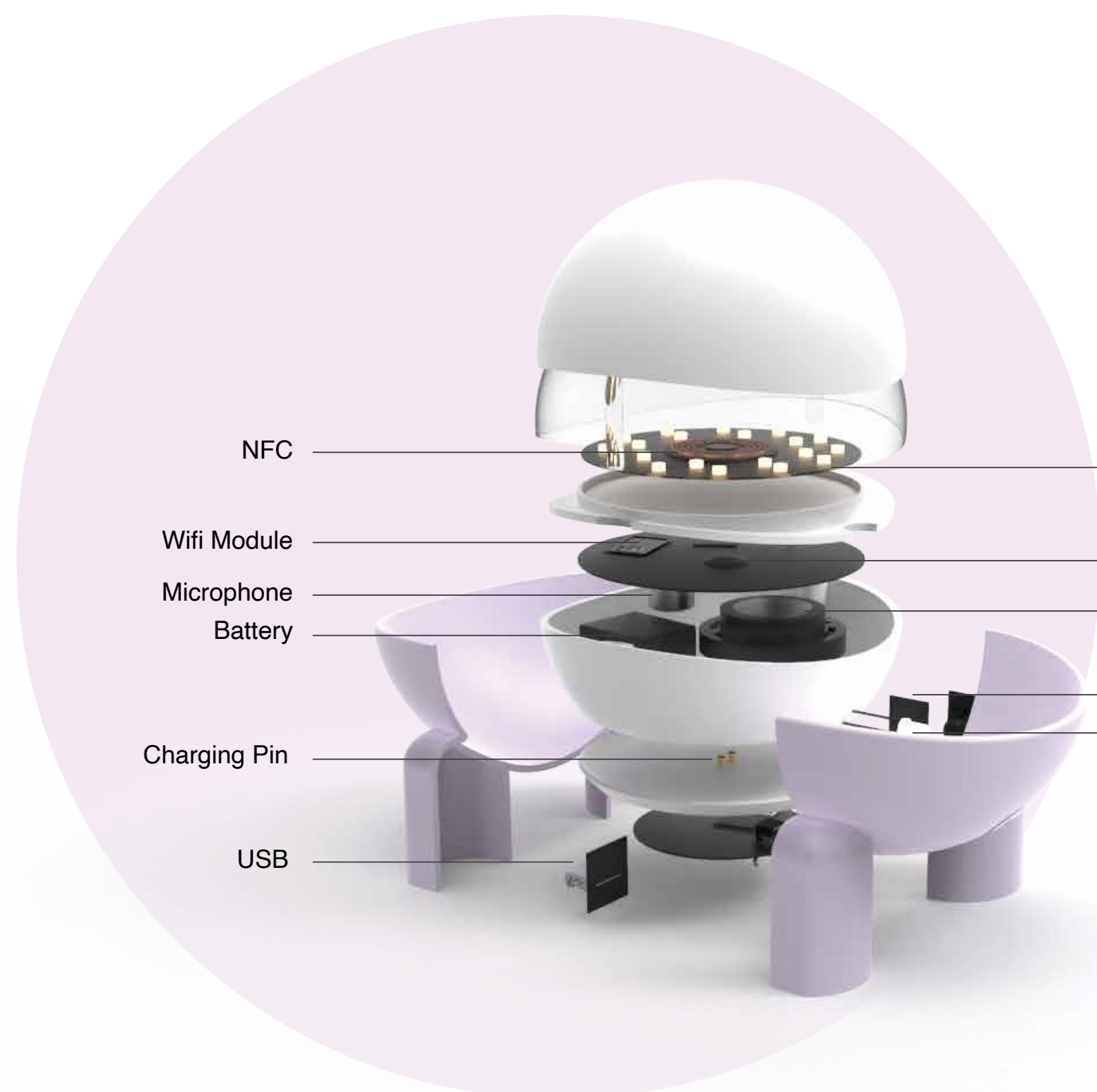
Evening

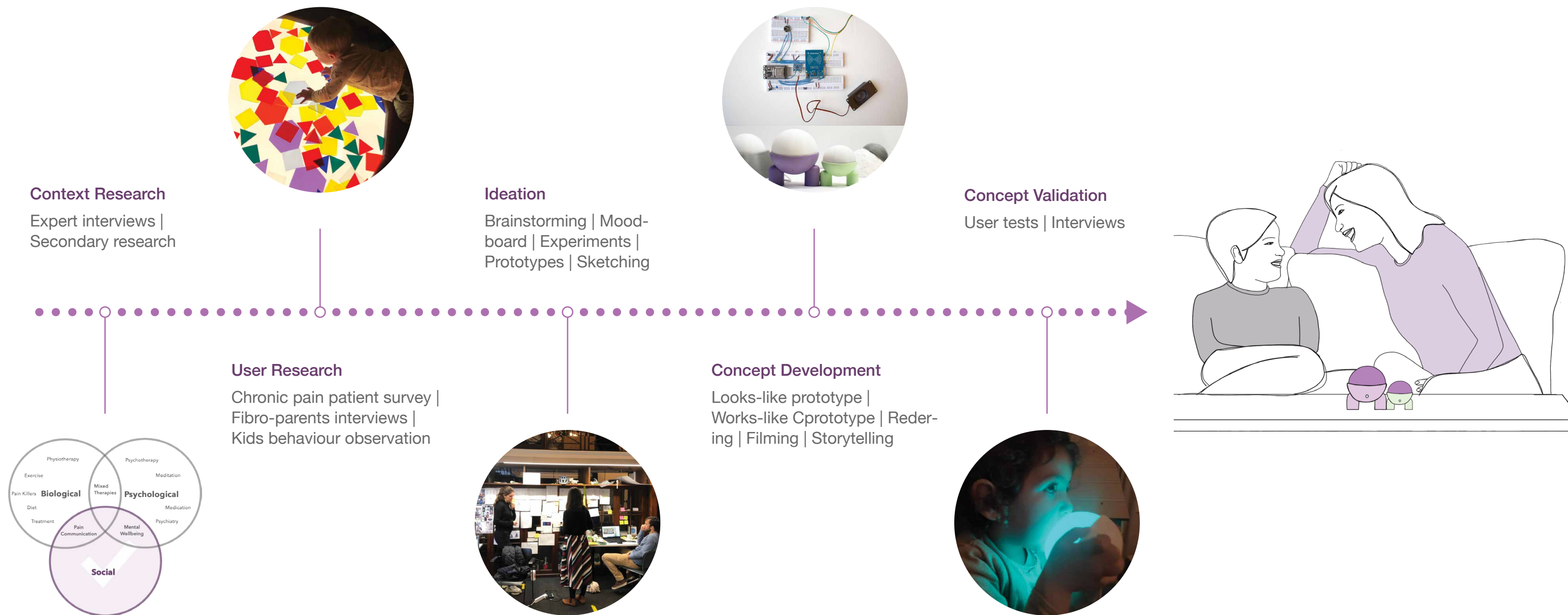


By using BrightSide a parent can establish a communication ritual that will help them overcome the barrier of speaking about their condition with their children. The interaction will establish a family conversation routine about parents' symptoms and efforts of getting better. This will reduce stress 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.







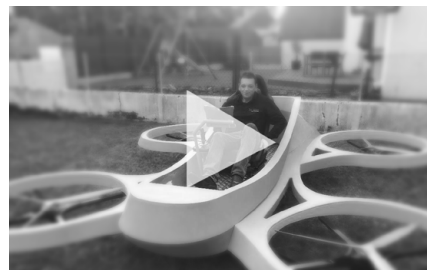




# COMET

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)

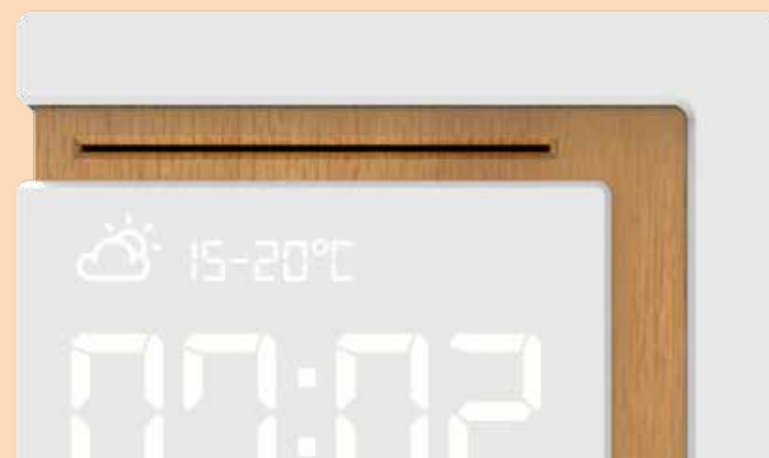




Designing an object that's always present in users' bedrooms is a significant challenge for designers: its visual appearance, texture and interface need to be gentle, assuring and nonintrusive.

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.



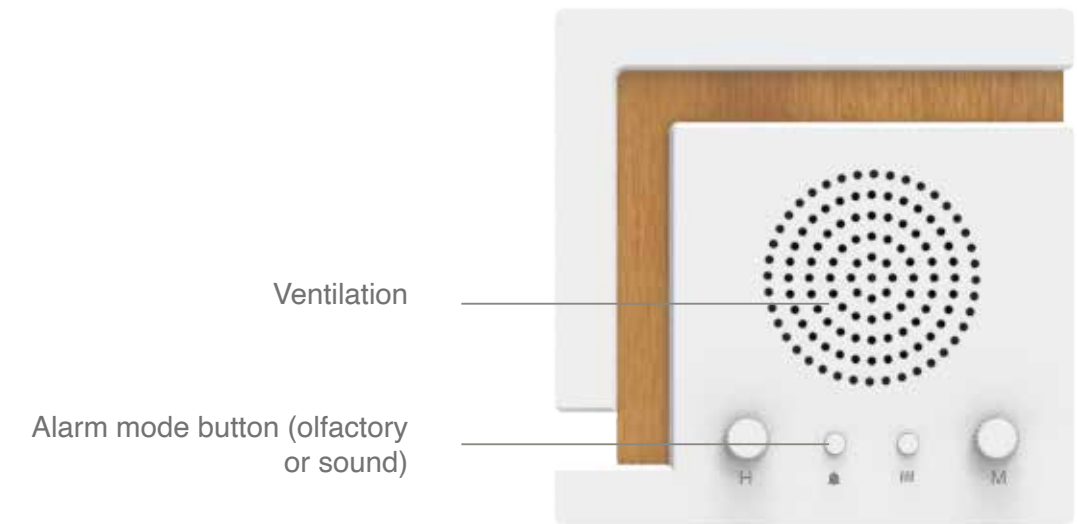
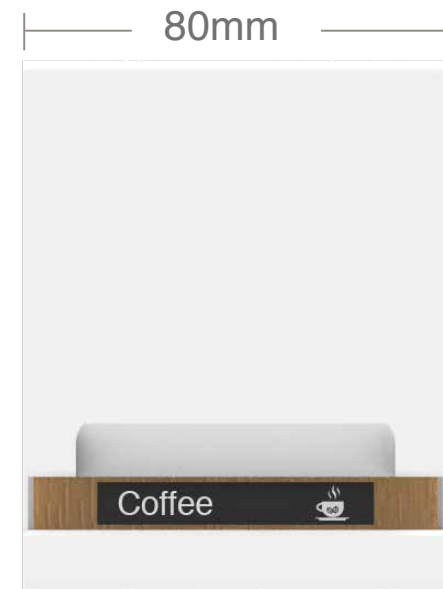
Alarm hour  
setting

Traditional  
alarm

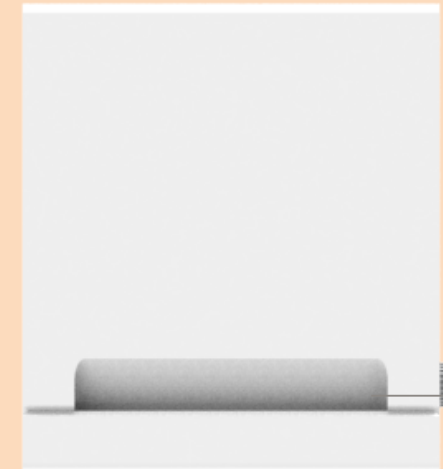
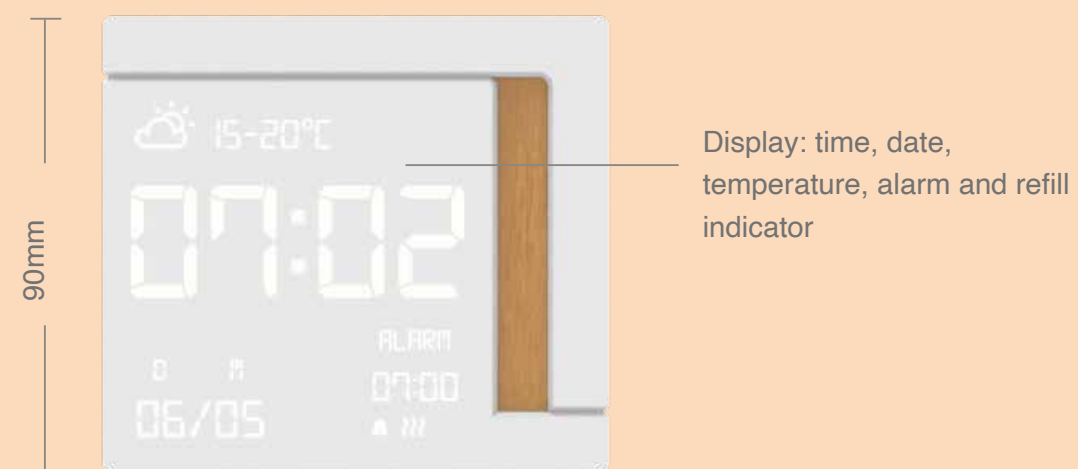
Olfactory  
alarm

Alarm minute  
setting

### Olfactory alarm on



### Olfactory alarm 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.

### Capsule integration

Hidden/Visible

### Form factor

Cubic/Spherical

### Survey Design

### Alarm stop button

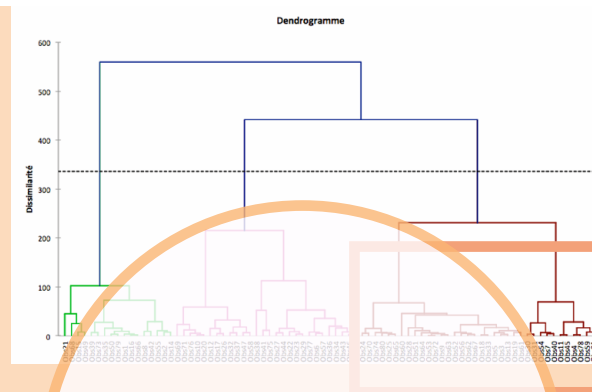
Integrated/Button

### Scent capsule content

Liquid/Solid form

Proposal	Capsule integration	Form factor	Alarm stop button	Capsule content
1	Hidden	Cubic	Integrated	Liquid
2	Hidden	Round	Integrated	Solid
3	Hidden	Round	Button	Solid
4	Visible	Round	Button	Liquid
5	Hidden	Cubic	Button	Liquid
6	Visible	Round	Integrated	Liquid
7	Visible	Cubic	Button	Solid
8	Visible	Cubic	Integrated	Solid

### Information Collection



### Analysis

Proposition	Observations	Average	Standard deviation
Proposition 1	36	7,250	1,538
Proposition 2	36	6,028	1,949
Proposition 3	36	5,028	1,558
Proposition 4	36	5,278	1,684
Proposition 5	36	6,444	1,463
Proposition 6	36	6,250	2,020
Proposition 7	36	6,667	1,287
Proposition 8	36	7,639	1,099

### Persona

Carly, 23 years old, biology student



Carly is a biology student who is quick to adopt new technologies. She appreciates well-designed tech products that are functional yet aesthetic. She has a healthy lifestyle and practice yoga outdoors on a regular basis.  
Carly does not have an alarm clock since she uses her iPhone to wake up. She wakes up easily but the noise sometimes stresses her. She would like to wake up on time without the disruptive noise in the morning.

### Persona







# 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



## Accessories - Design Cycle

Upper body

Planetary gearbox and motor

Lower body (housing for PCB and connection brick)

Bullet support



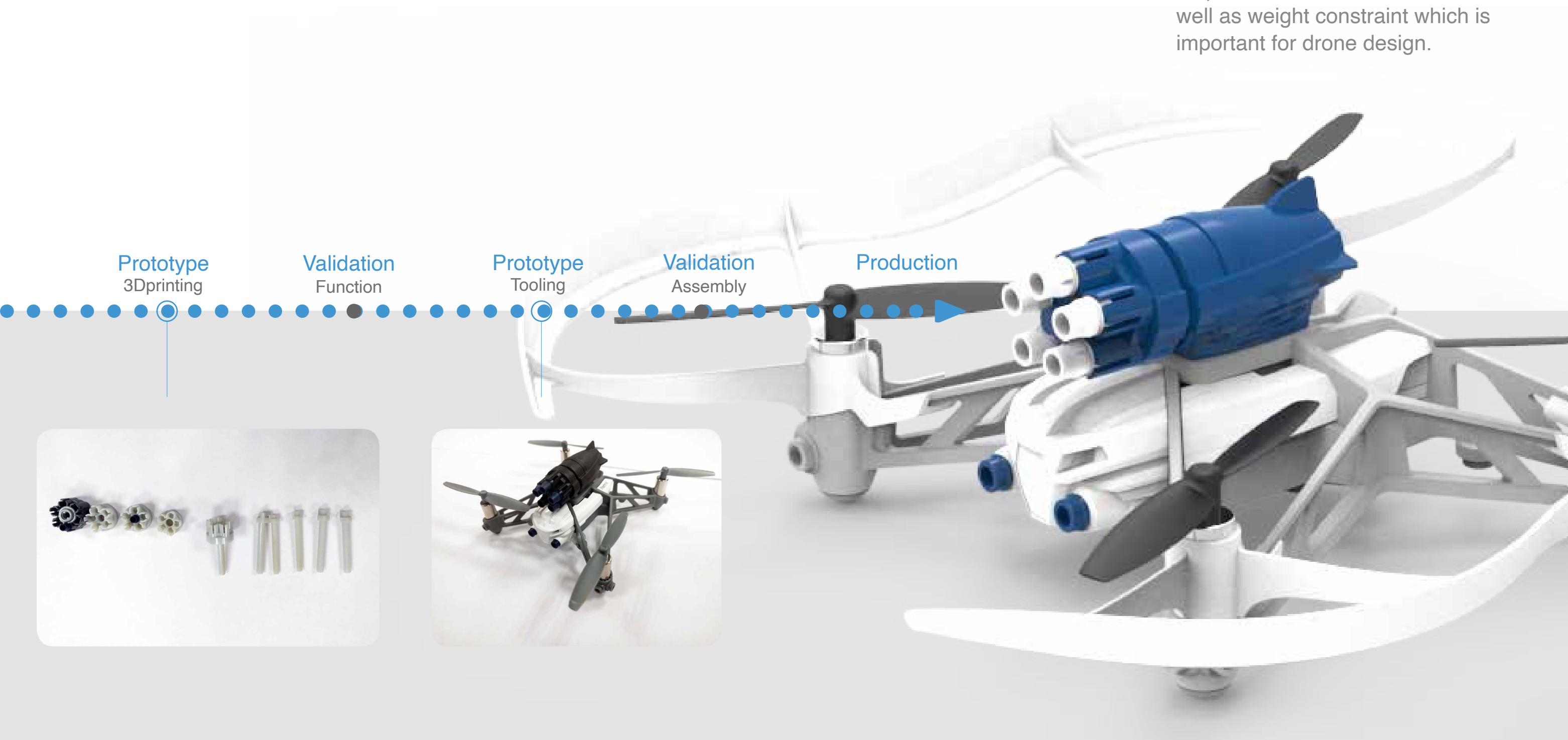


# Parrot

## Accessories - Design Cycle

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.







# Xian-Zhi ZHANG

cestxianzhi@gmail.com  
xz-zhang.com