

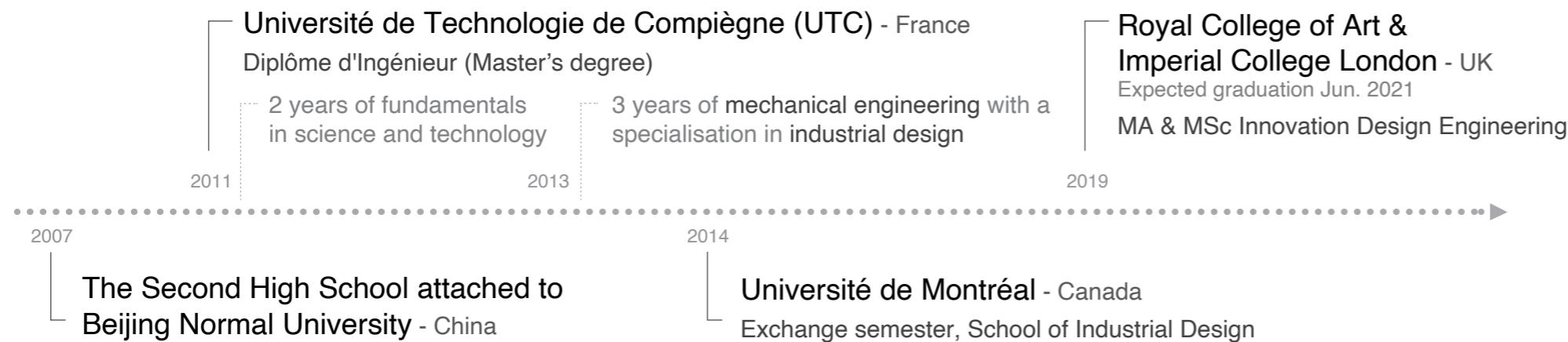
Xian-Zhi **ZHANG**

cestxianzhi@gmail.com

xz-zhang.com

Xian-Zhi ZHANG

Education



Experiences

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.

Laboratoire d'Électromécanique de l'UTC - Designer

Jul. - Aug. 2016

Designed a concept hydraulic passenger drone that transforms how people travel in 3D spaces instead of 2D surfaces. The design has been selected for a 1:1 scale physical prototype and implemented by the laboratory as a proof-of-concept.

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

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Skills

Design

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

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

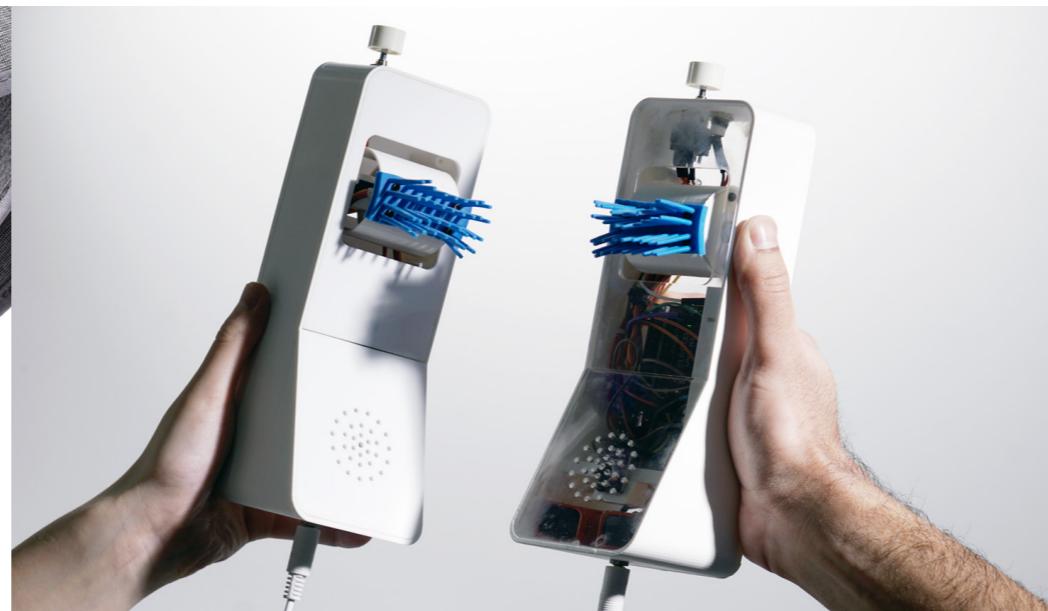
Patent

Device for analysing cardiovascular parameters of an individual, publication number: 20200121197

Two US pending patents related to Withings BPM Core

Press

Dezeen: RCA students design phones that turn speech into physical sensations



Withings BPM Core & BPM Connect

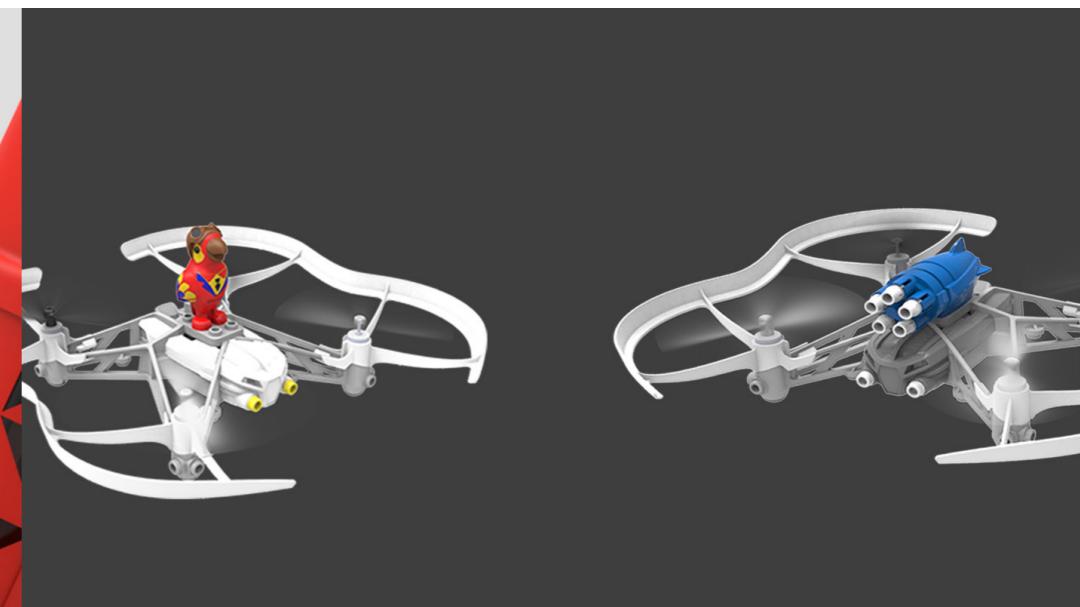
Usable Cardiovascular Monitors

Feel the Conversation.

Interactive Communication

COMET

Urban Air Mobility



SensorWake

Olfactory Alarm Clock

Vidå

Instant Filtration System

Parrot Accessories

Connected Drone Accessories

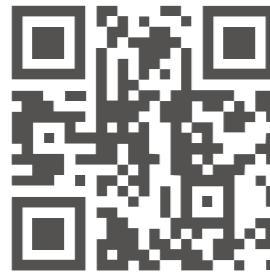
WITHINGS

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.

Over the past 2 years, 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.

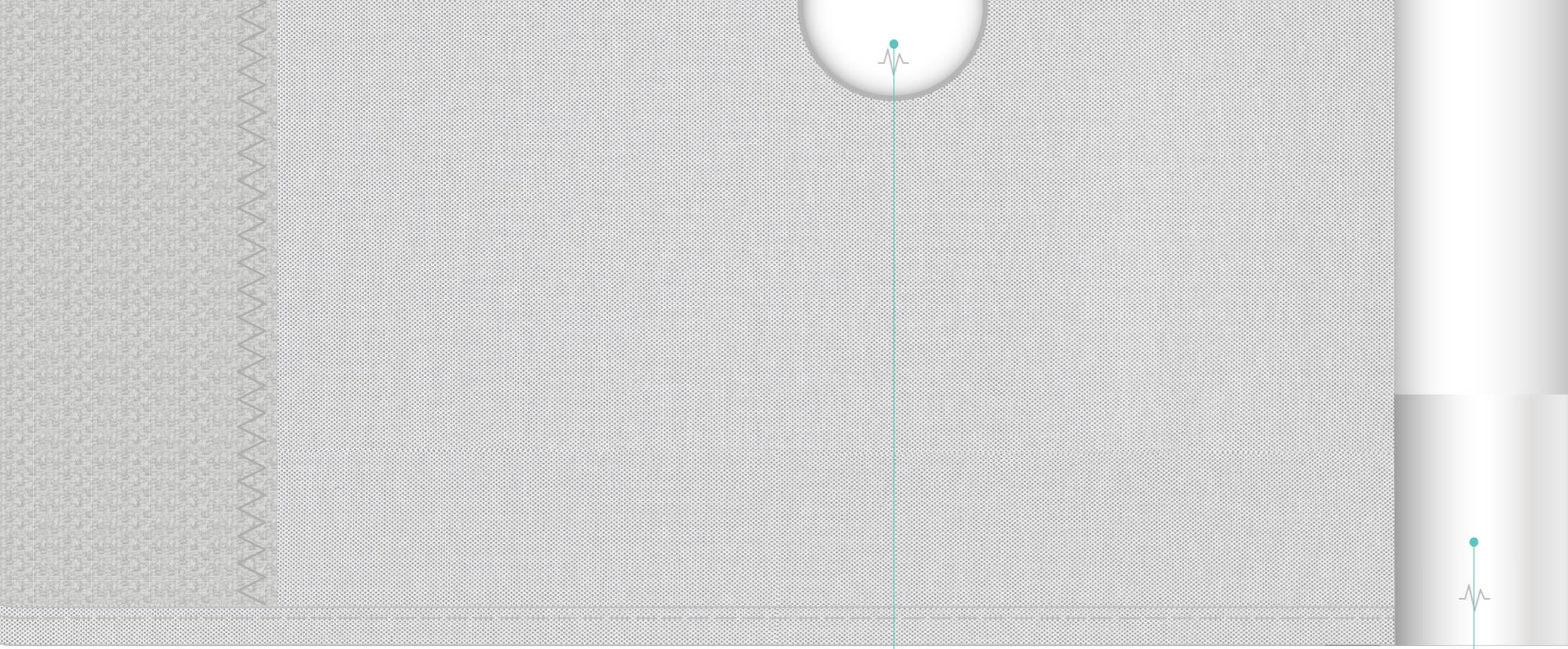
Withings BPM Core is recognised with the CES 2019 innovation awards and distributed by our distribution partners including Apple Store and FNAC.

Mechanical Engineer

2016 - 2019



Due to confidentiality agreement, certain technical details have been omitted in this presentation.



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

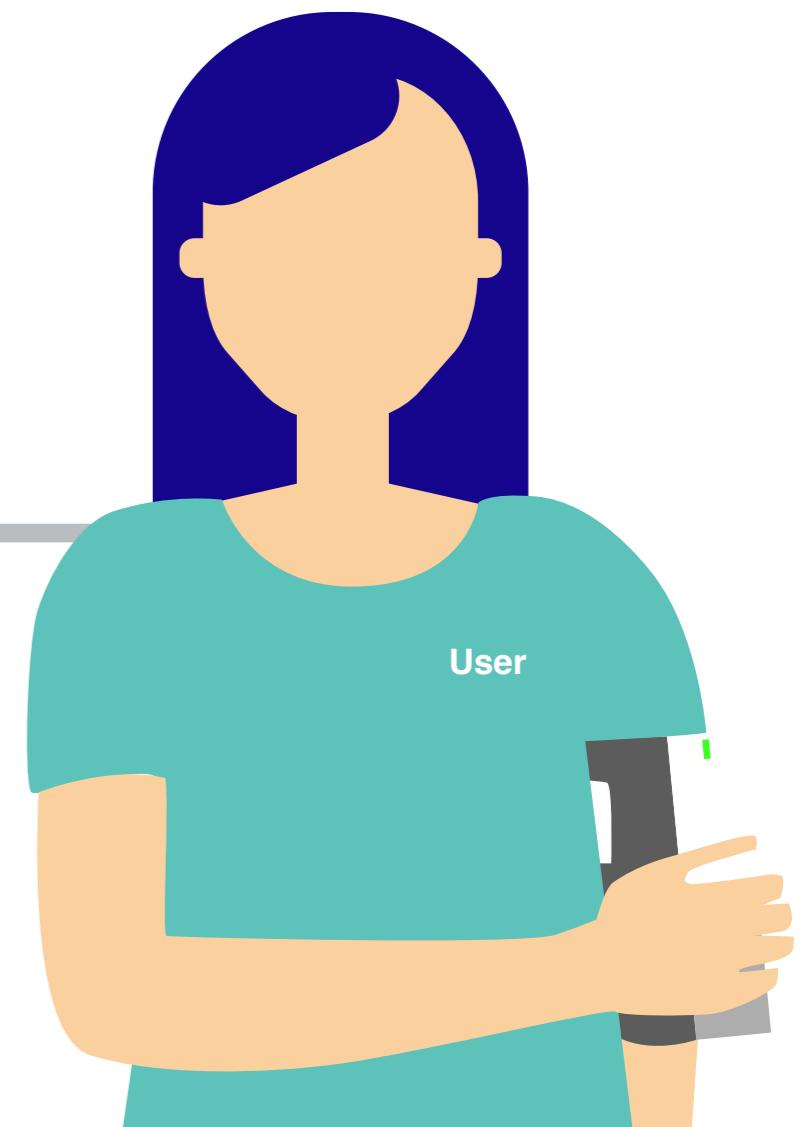
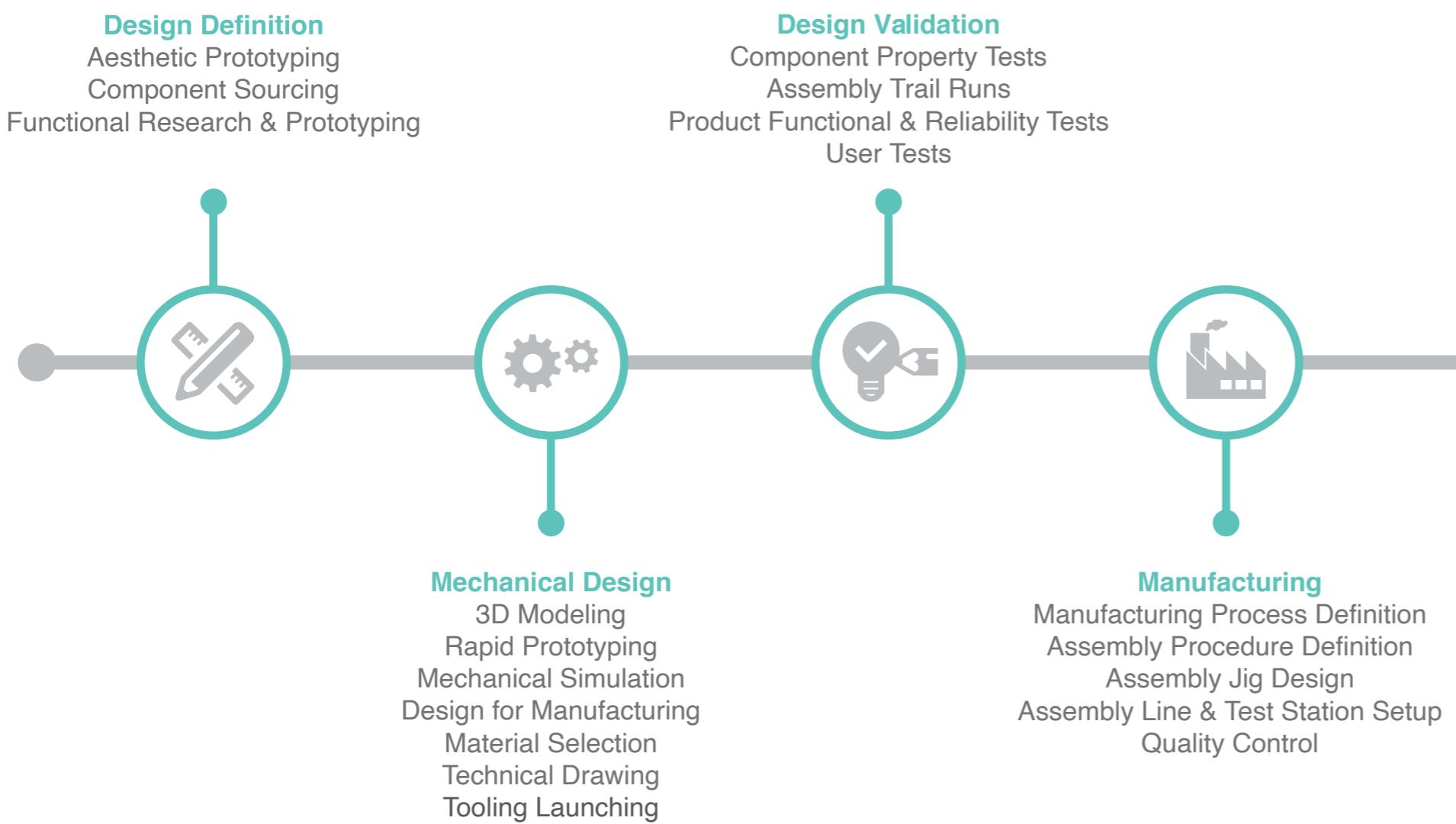
Detects **valvular heart disease** - a defect of the heart valves that can lead to heart failures.

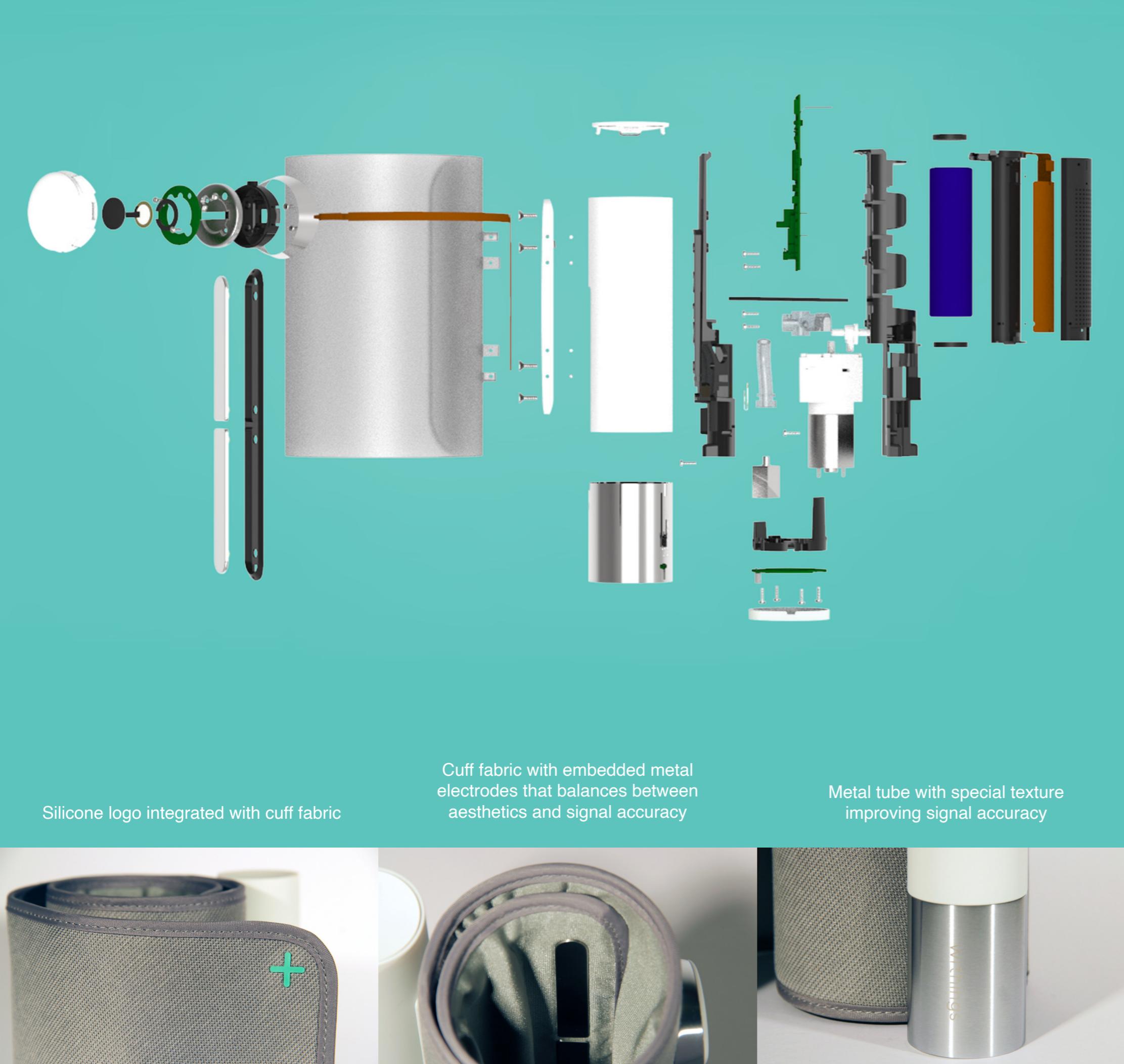


Electrodes

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.

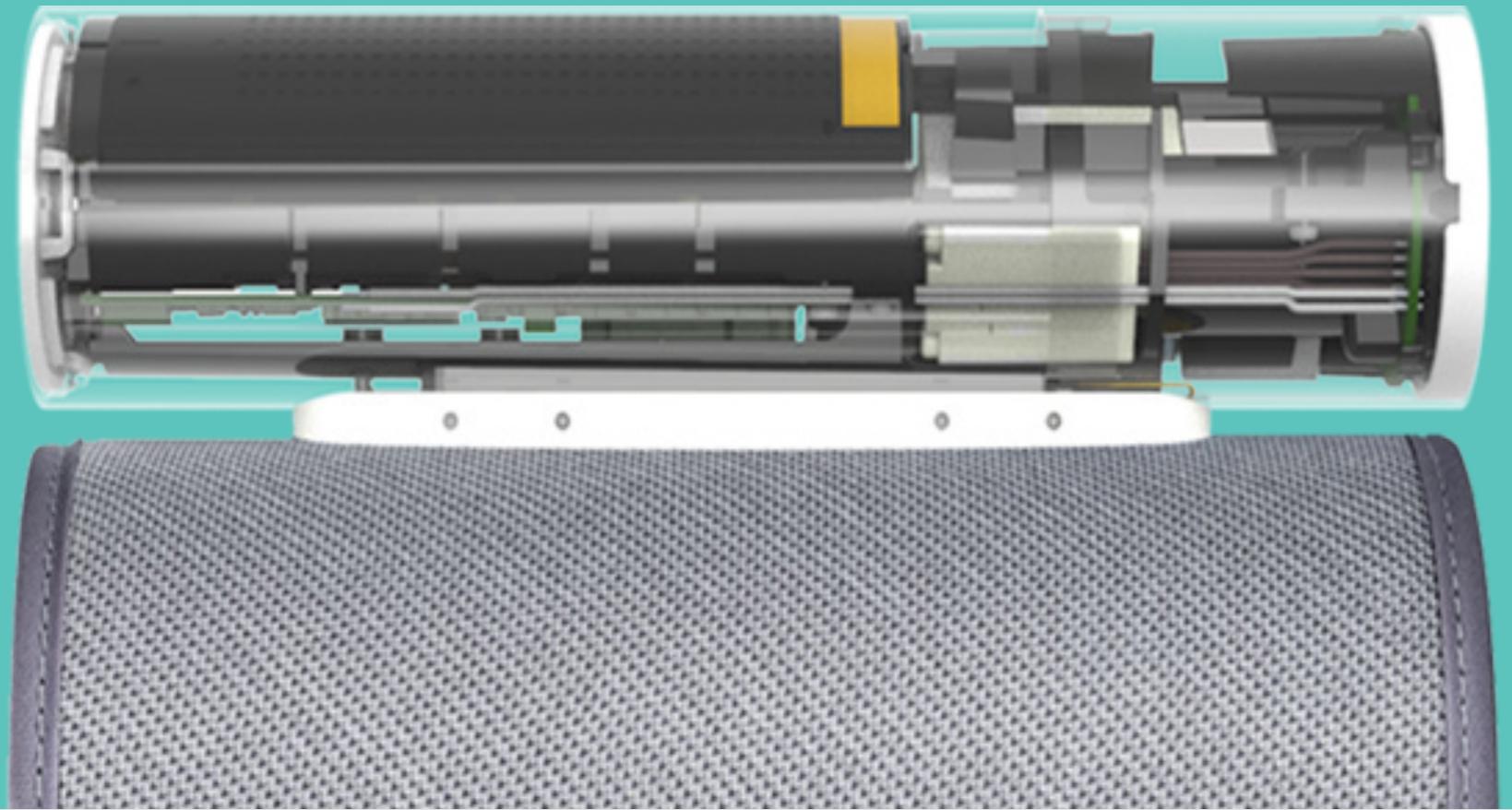
Attention to details, thoughtful decisions and rigorous testing all contribute to the finished product that translates to real-world differences for the end users.



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 our distribution partners including Apple Store and FNAC.

Mechanical Engineer

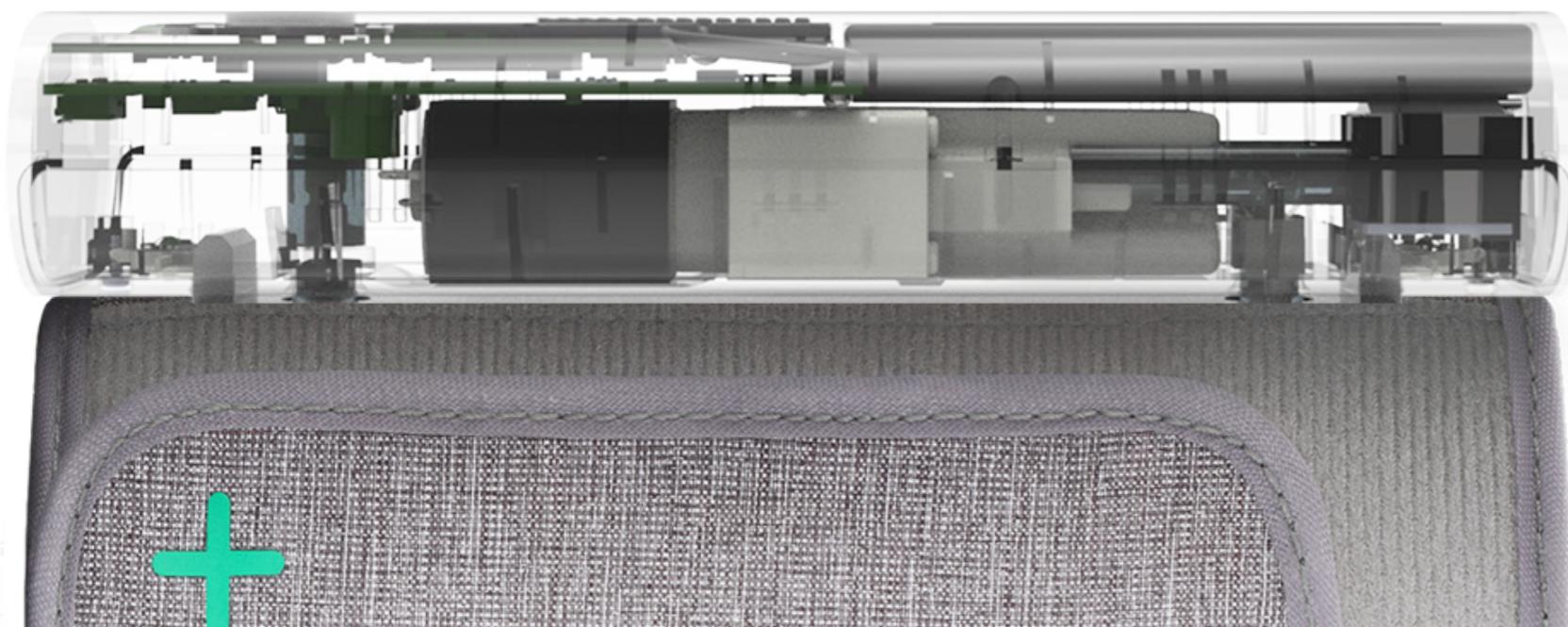
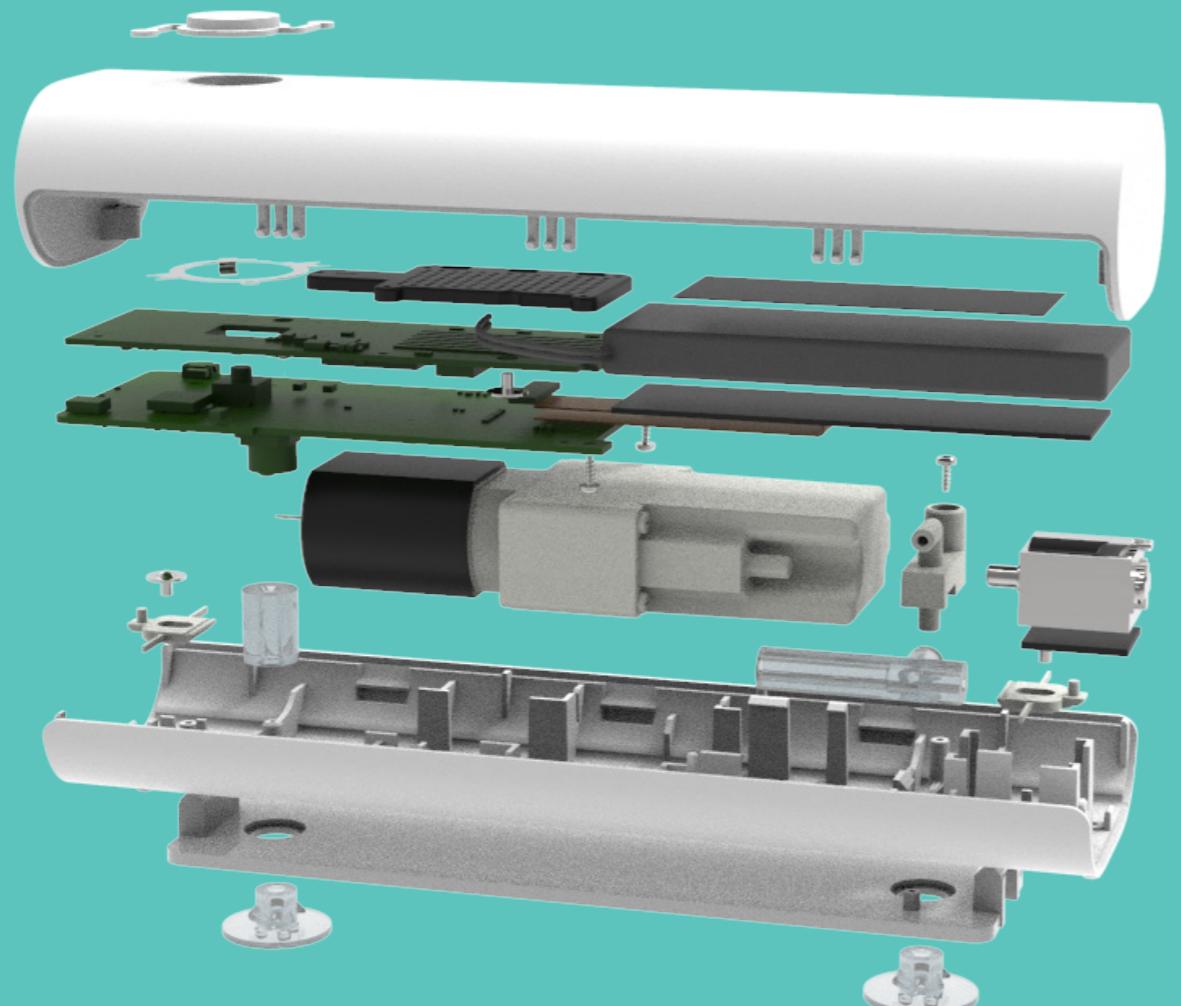
2018 - 2019

Due to confidentiality agreement, certain technical details have been omitted in this presentation.



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

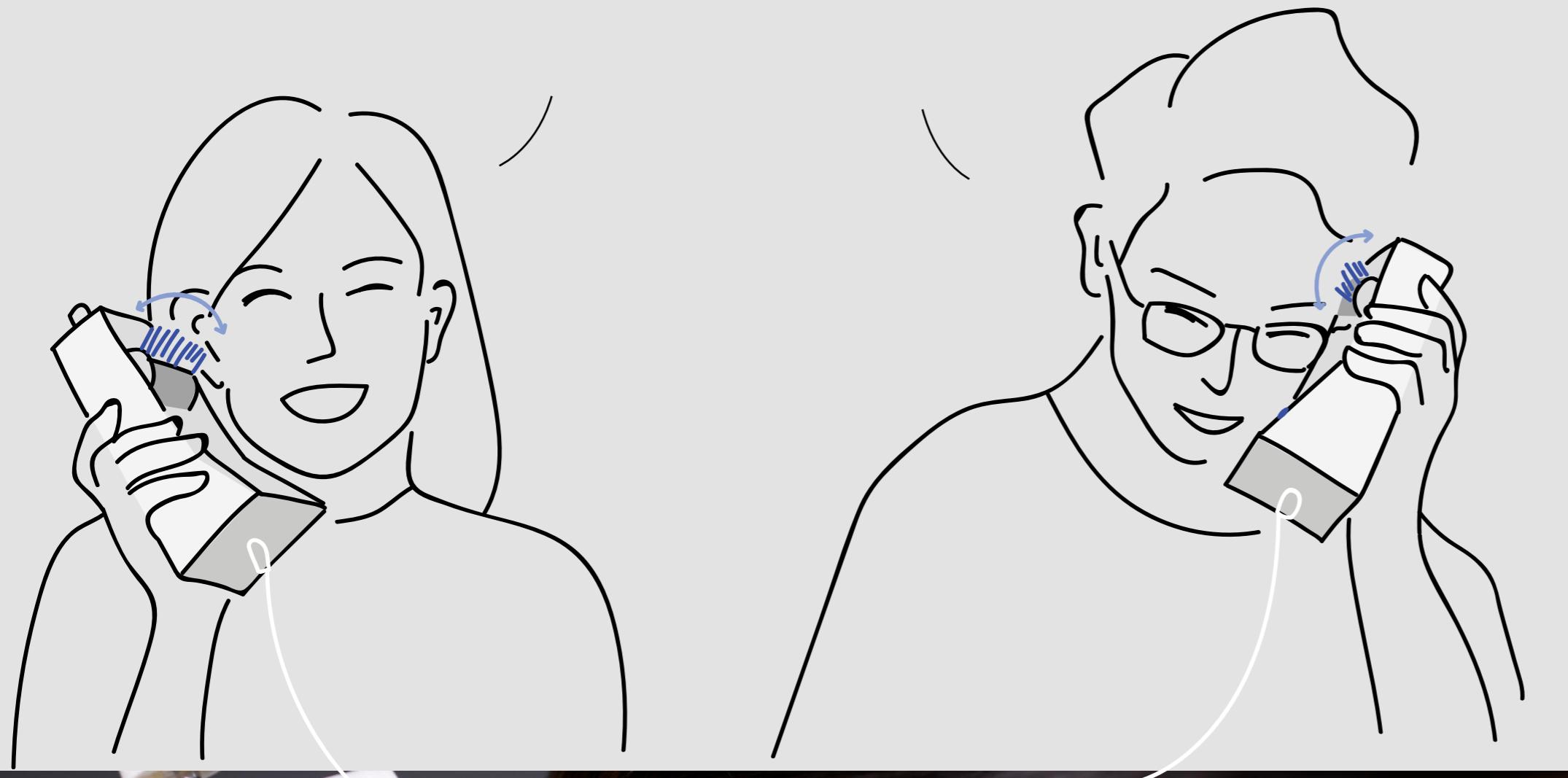
2019.11 - 2019.12

Student Project (in pair)



嗨，最近怎么样？

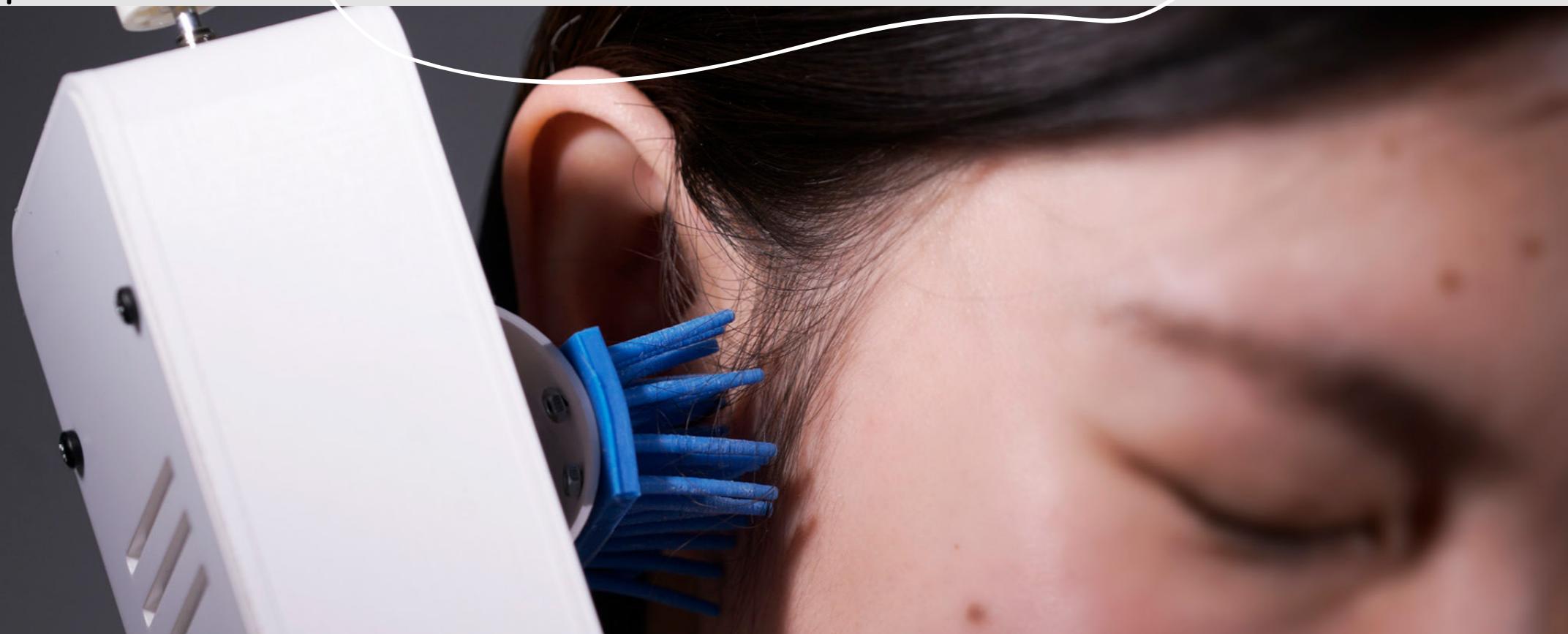
I'm fine, and you?



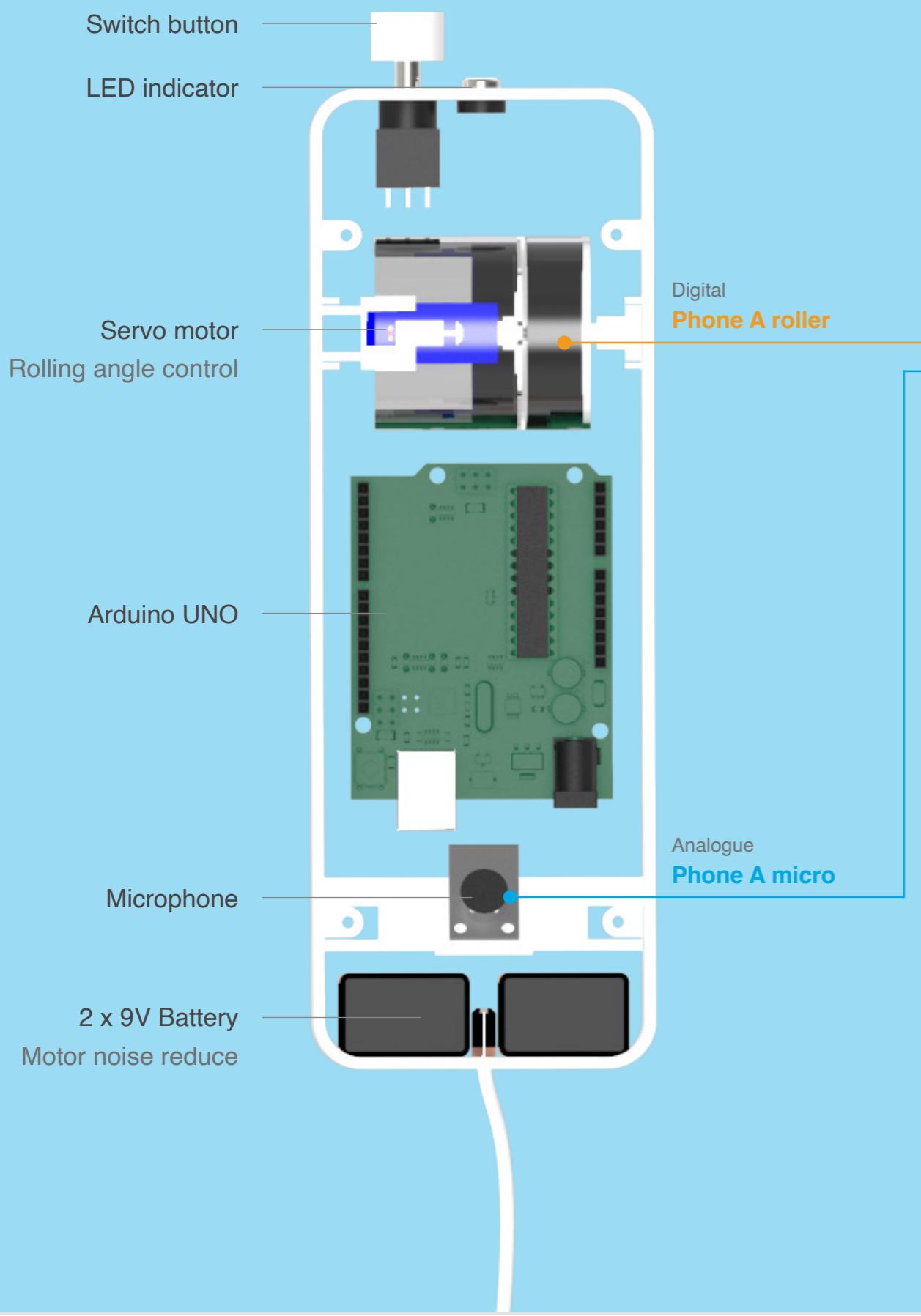
Feel the conversation.

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.



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.





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.

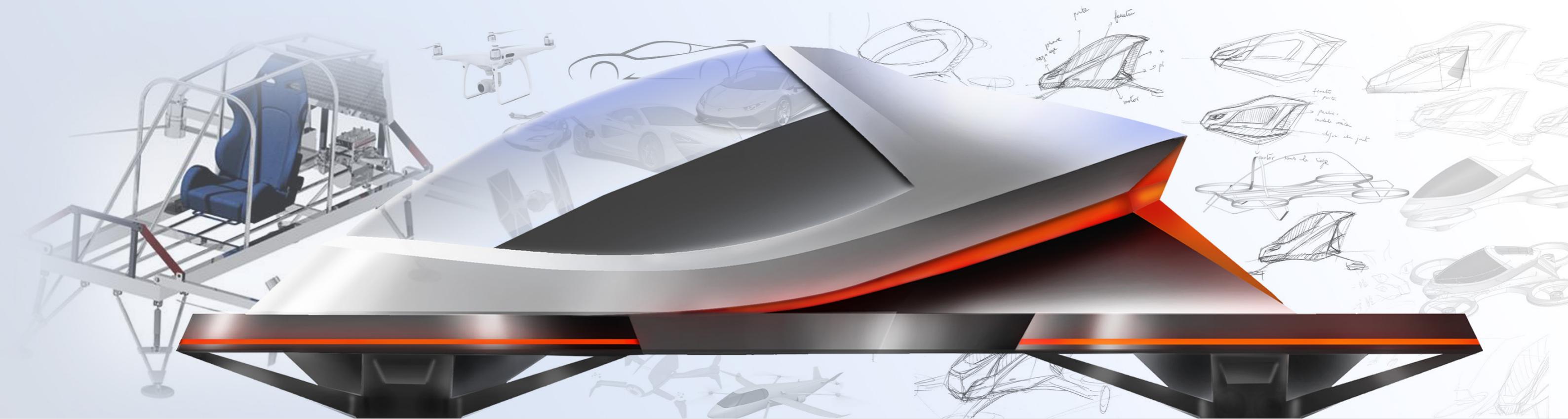
The design of COMET strives first and foremost for **individuality** and **agility**, underlined by its streamlined body and aerodynamic design that emphasize maneuverability and precision.

3D technical specification

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

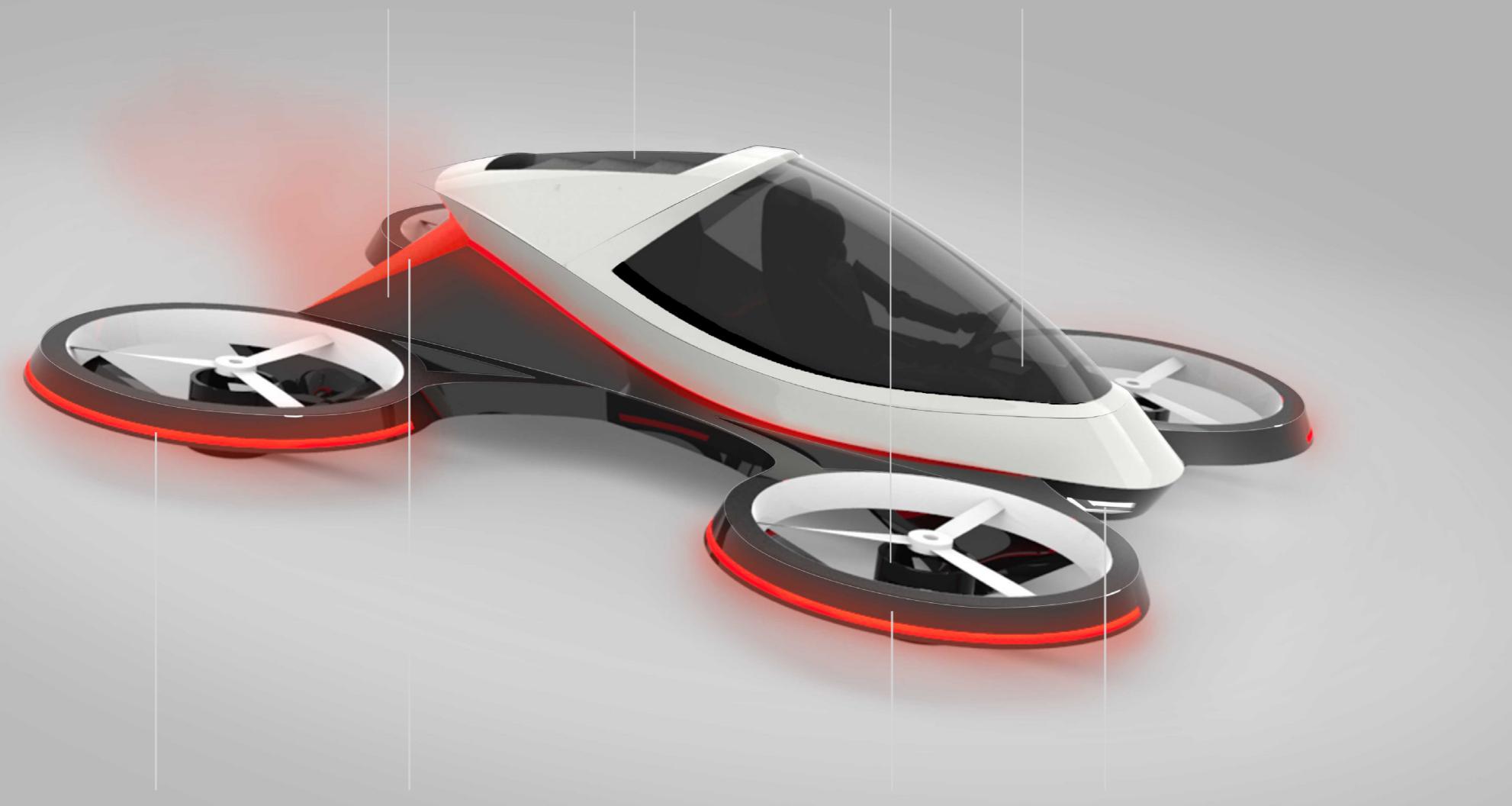
Sketching

3D Modeling



Function

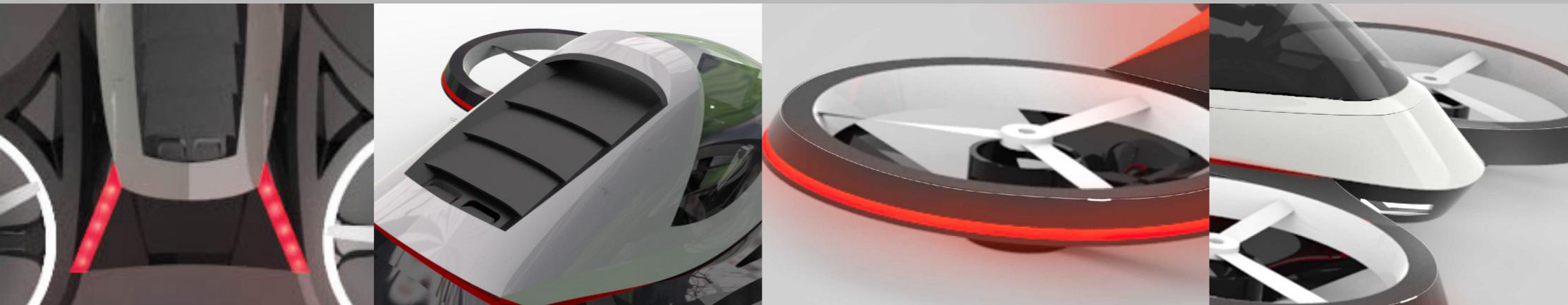
Compartment for hydraulic propulsion system Radiator grille Engine support and wire passage Cockpit



Safety

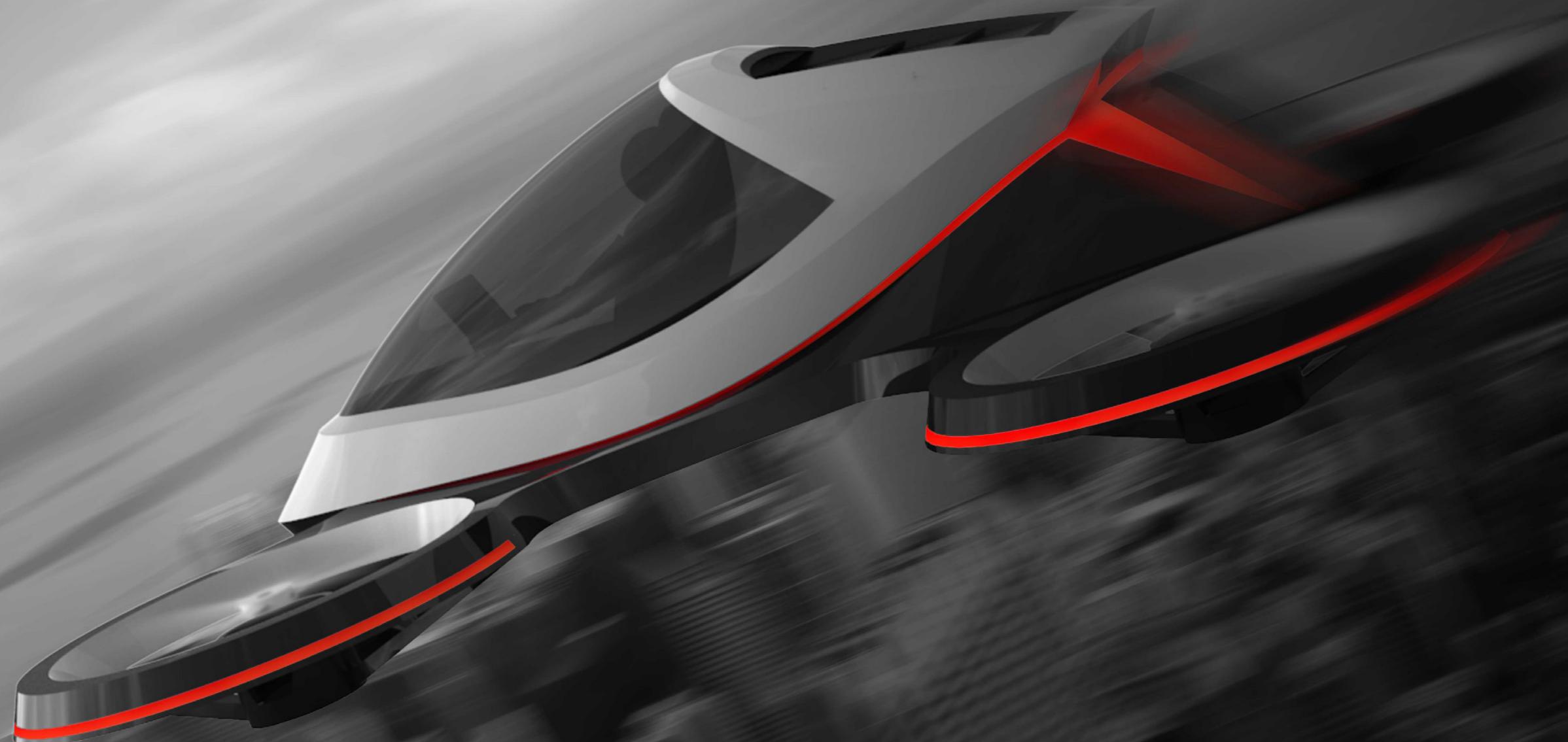
Blinkers Rear lights

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.

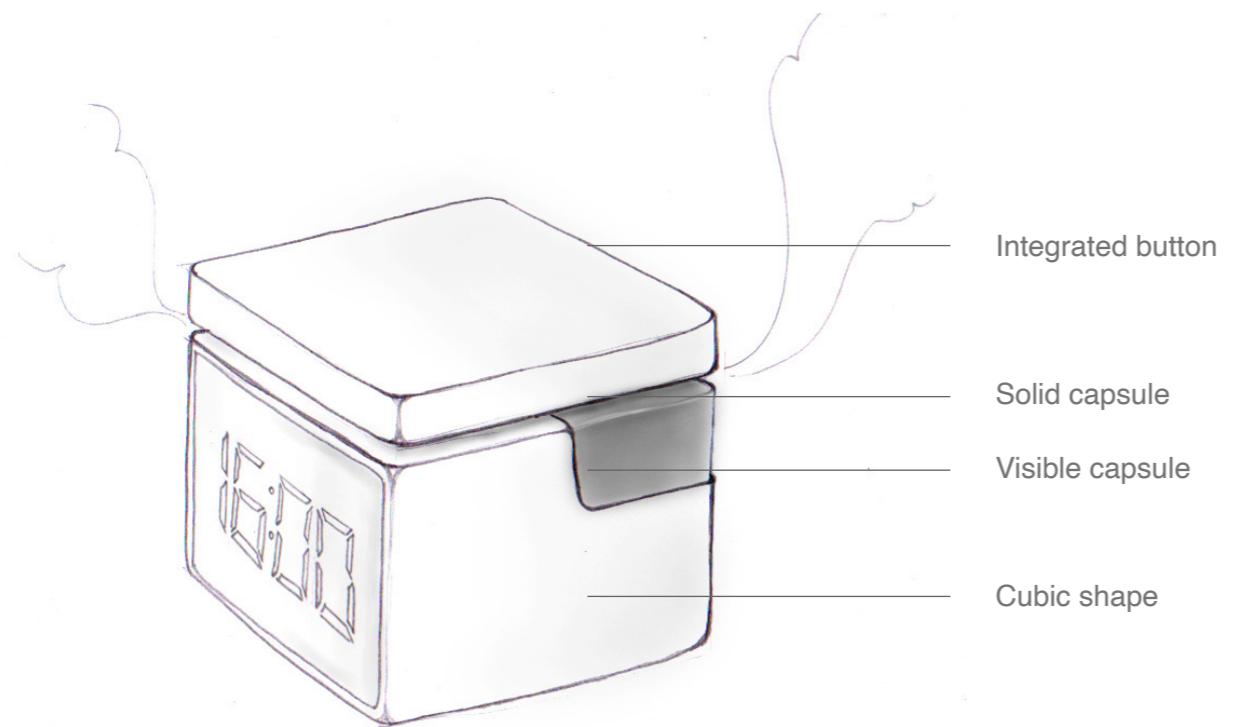
During a student project, I proposed to redesign this olfactory alarm clock for a more gentle, intuitive and intimate wakeup.

Industrial Designer

2015 Spring

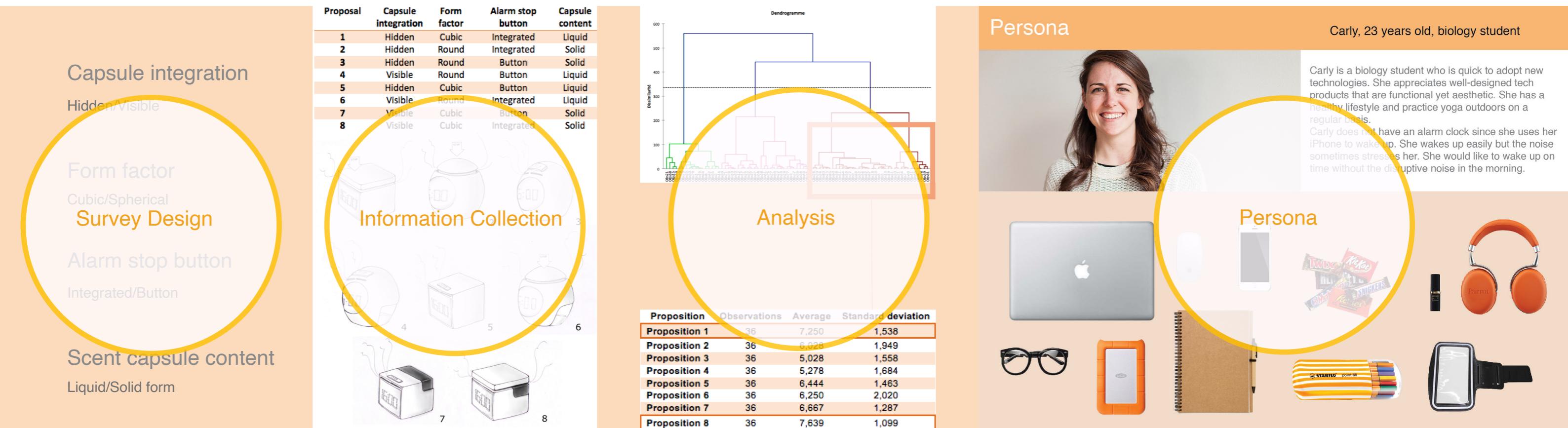
Student project (in pair)





Design proposal according to user studies

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.



Redesign - Design Decisions



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.

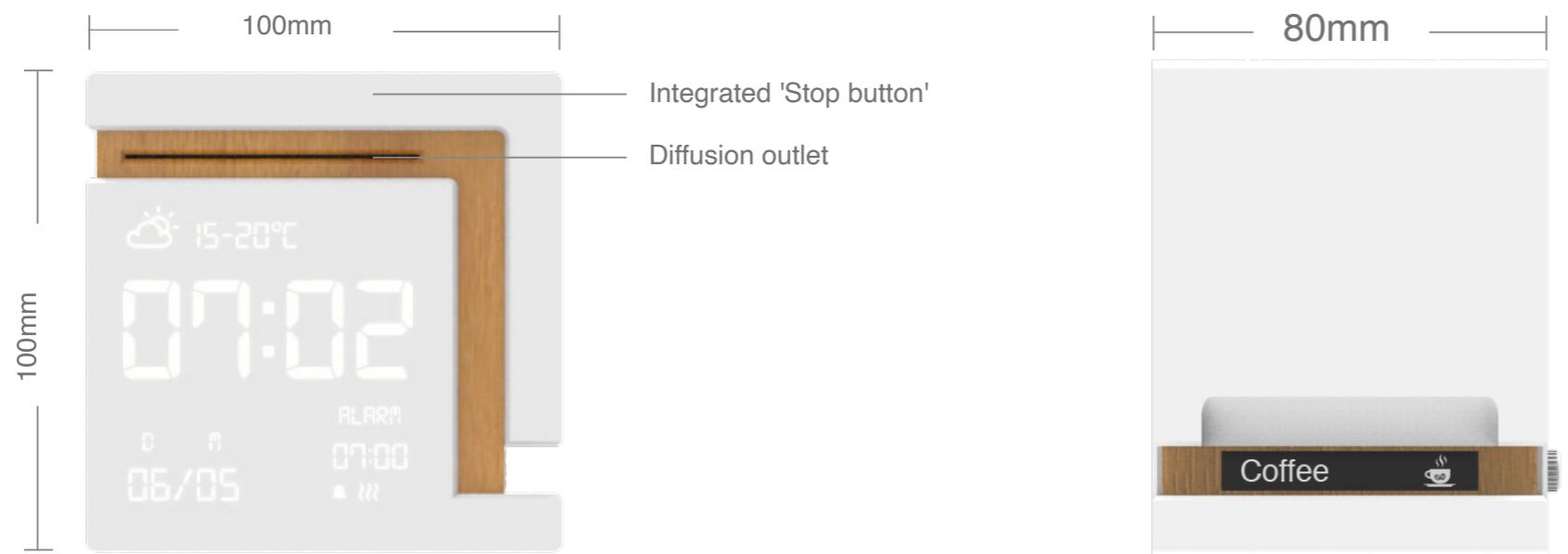
The **wooden diffuser** blends in naturally in bedroom setting. The **pressure-sensitive top** retains a familiar "snoozing" interface that's made even more intuitive by blocking the scent outlet physically when pressed down. The **LED display** on the front brings up information that is useful for the upcoming day without the glaring light that traditional display emits.



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.



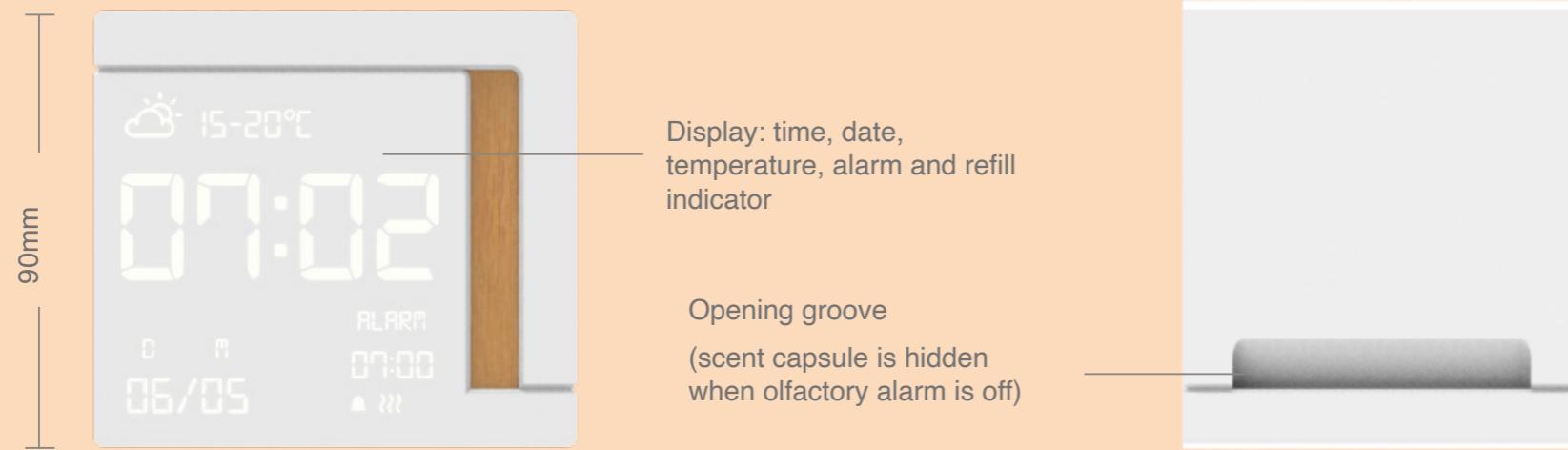
Olfactory alarm on



Ventilation
Alarm mode button (olfactory or sound)



Olfactory alarm off



Display: time, date, temperature, alarm and refill indicator

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





Vidå

Vidå is a student project that re-thinks filtering for drinking water for the brand Bodum.

Vidå's innovative filter system is inspired by the brand's famed French-press coffee maker and strives to **remove the annoyances** encountered in day-to-day usage of convectional filtering jugs.

Industrial Designer

2015 Spring

Student project (in pair)



What is wrong when you need drinking water?



1



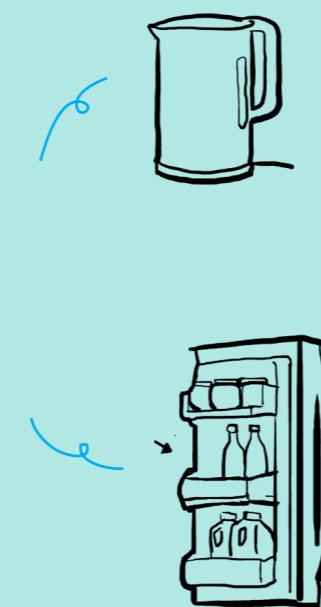
2

Long wait time



3

Heavy, difficult to hold



Too big to fit in fridge



4

Never read



5

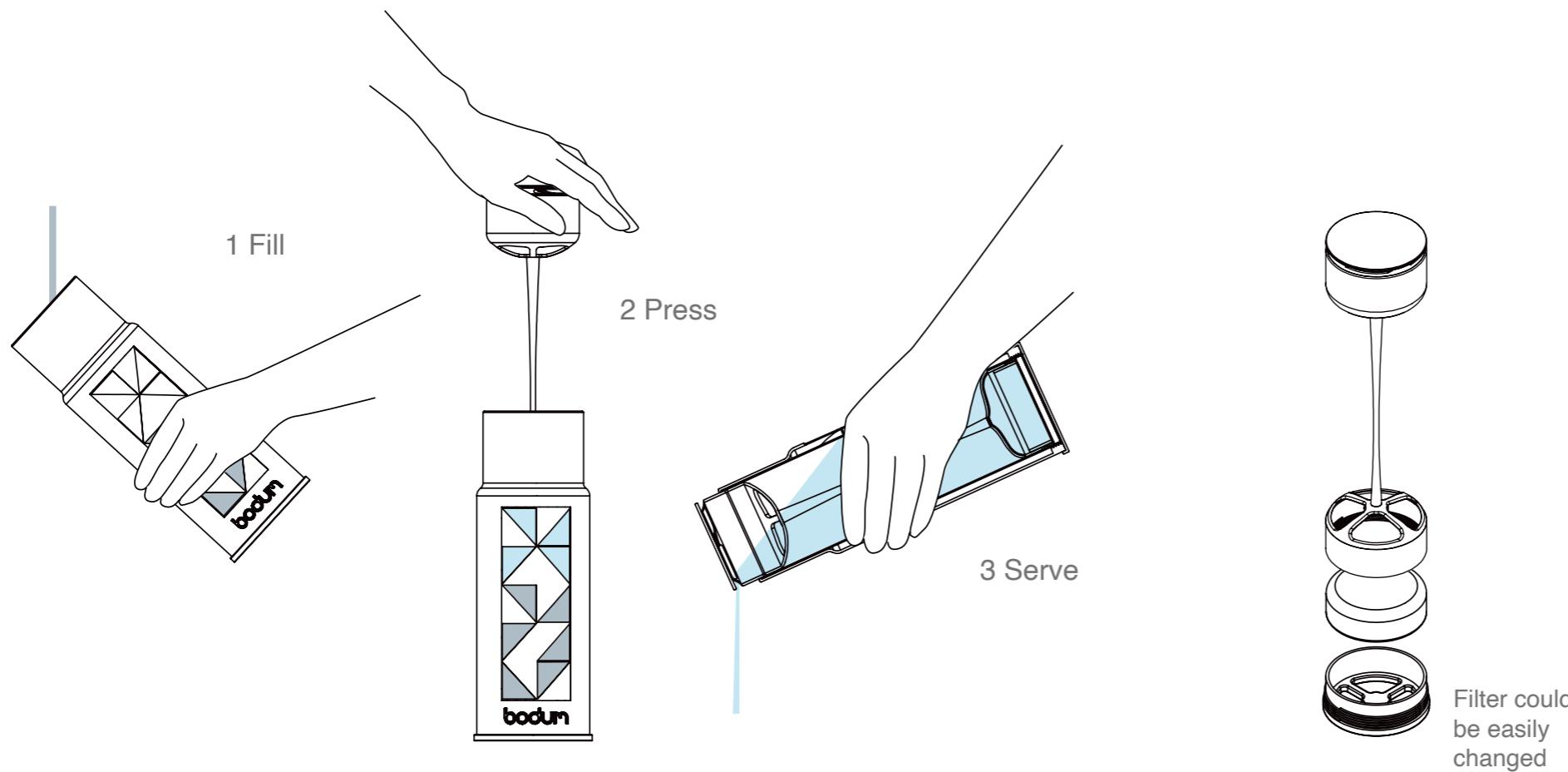
Hard to take out

The goal of this project is to realise the importance of understanding users' **pain points** in their day-to-day lives and propose an experience from the first principles that answer users' needs.



The pressure based filtering system gives users an intuitive filtering experience, allowing users to get drinking water **instantly**. Its visual appearance, minimalist and modern, is primarily inspired by Scandinavian design elements with customizable recurring geometries.

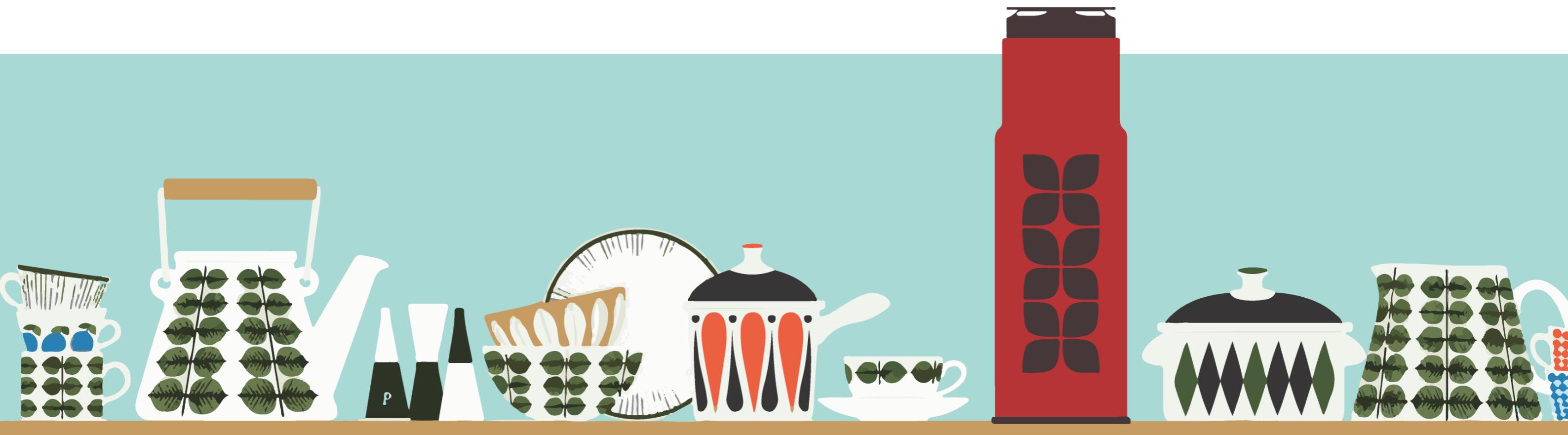




To use the filter jug, user could simply remove the piston, fill the jug with tap water, and press the piston. The water is **immediately** filtered and ready to be served.

Portable, Vidå is easy to hold and could be put in the fridge.

Vidå's cartridges are designed to be **easily replaced**. To change the cartridge, user could simply unscrew the bottom of the piston.



Seal

Silicone

Shell (customizable)

Plastic

Water compartment

Plastic



Omnidirectional
outlet

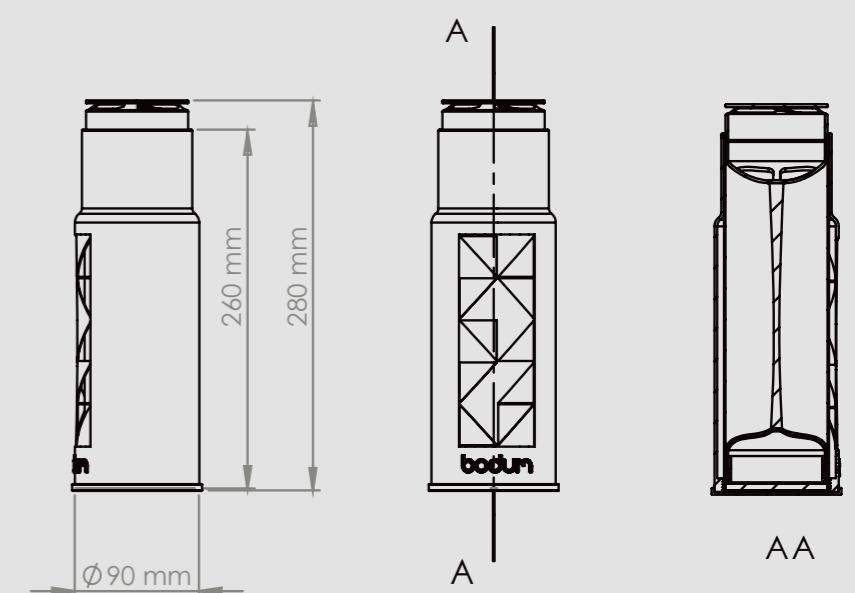
Piston
Plastic + Tamis

Filter cartridge

Lower part of piston
Plastic + Tamis

Vidå has a capacity of 1 liter. With this form factor, the jug fits in the fridge easily.

The hollow-carved design on the shell is used to visualize the water level. The specially designed top of the piston makes it possible to serve water from all directions.





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



Due to confidentiality agreement, certain technical details have been omitted in this presentation.