



POLITECNICO
MILANO 1863

Final Project

L I L Y

Group 11

BACKGROUND

BRIEF

Develop a portable olfactory display prototype designed for perfumery exhibition and customization using piezo-atomiser technology. The aim is to **allow the user to test fragrance combinations** while informing him/her about the specific ingredients used while **complementing their experience with augmented reality** to deepen user connection with the brand.

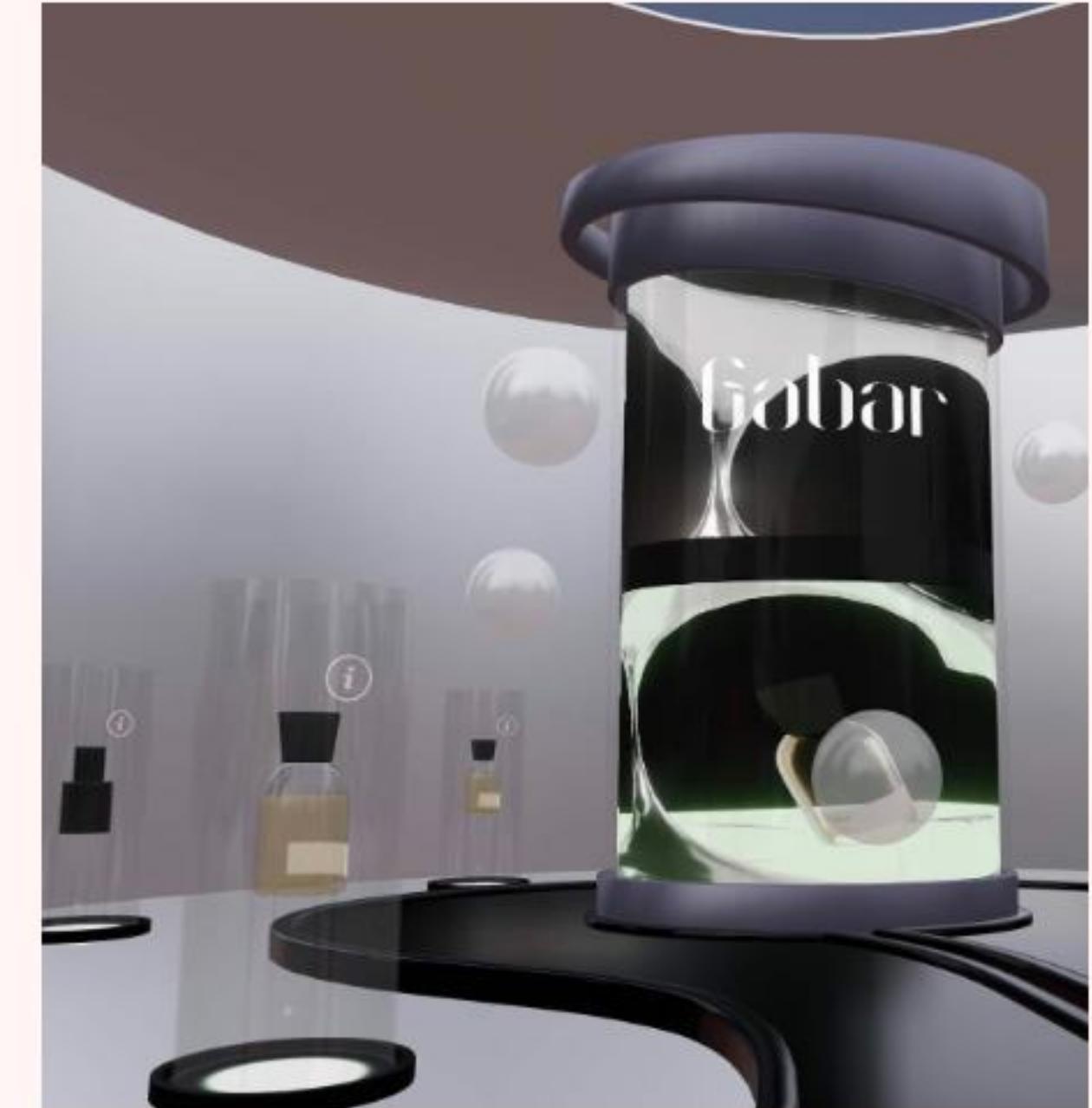
RESEARCH



FeelReal



The Power of Scents: a
Neuromarketing study in
Virtual Reality reveals new
insights



In the Metaverse, Perfume
Is About Everything But
Scent

USER

Young User (20-35 y.o.) interested in the perfume world and trying more experiences in the luxurious world. He is willing to use different products to involve himself in the perfume context, from physical to virtual material.

&



The referent context is a luxurious specific brand store. It is a place where the user can customize the perfume he wants to display through mixed realities technology.

CONTEXT

REQUIREMENTS

Allow easy disassembly for the replacement/refill of fragrances and components

Rely on piezo-atomizer technology

Capability to operate the system physically while being guided virtually (AR)

Select set of fragrances in AR

Use AR control board with AR-Markers

Display fragrance information when interacting with the scent

Capability to hold 6 scents

VIDEO 1

**A new way to experience
the fragrance world**

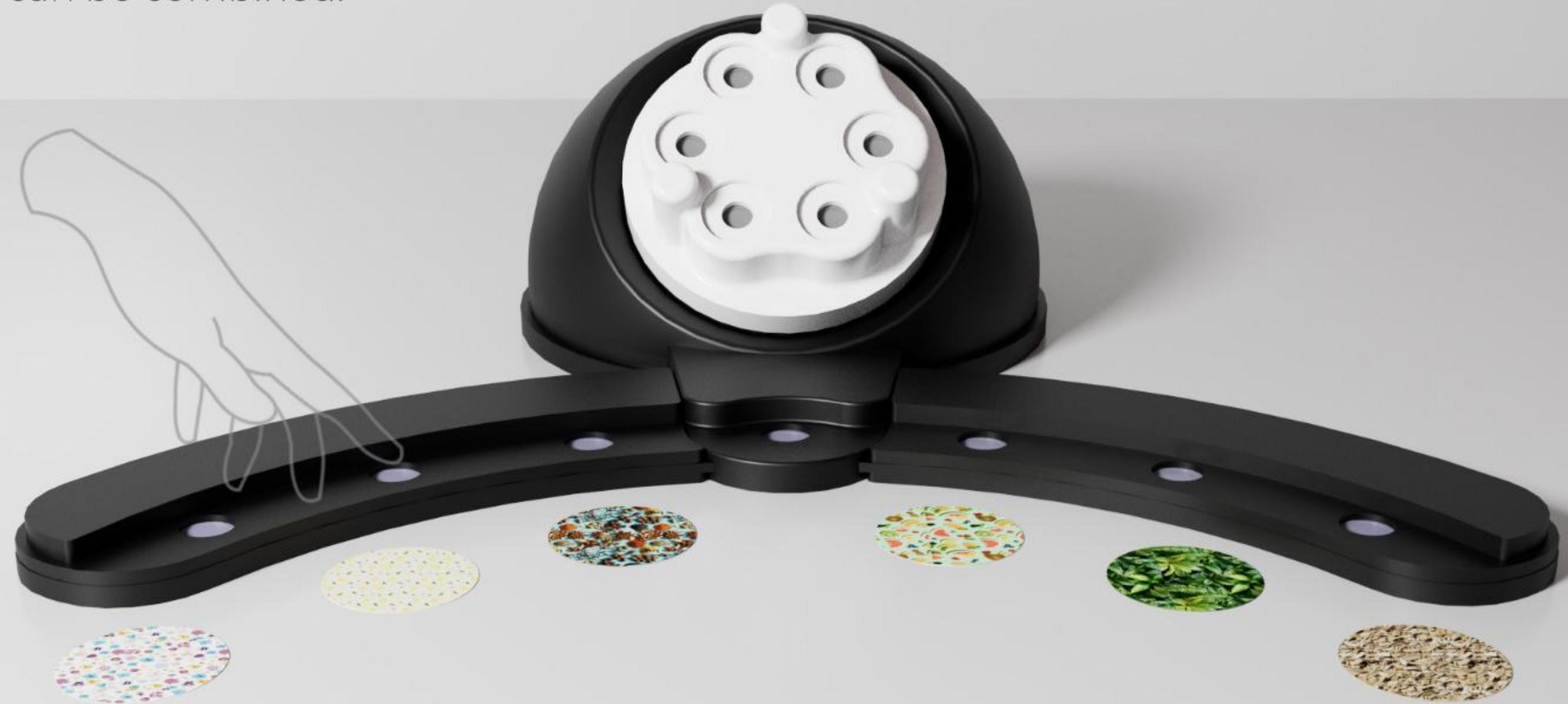


STORYBOARD



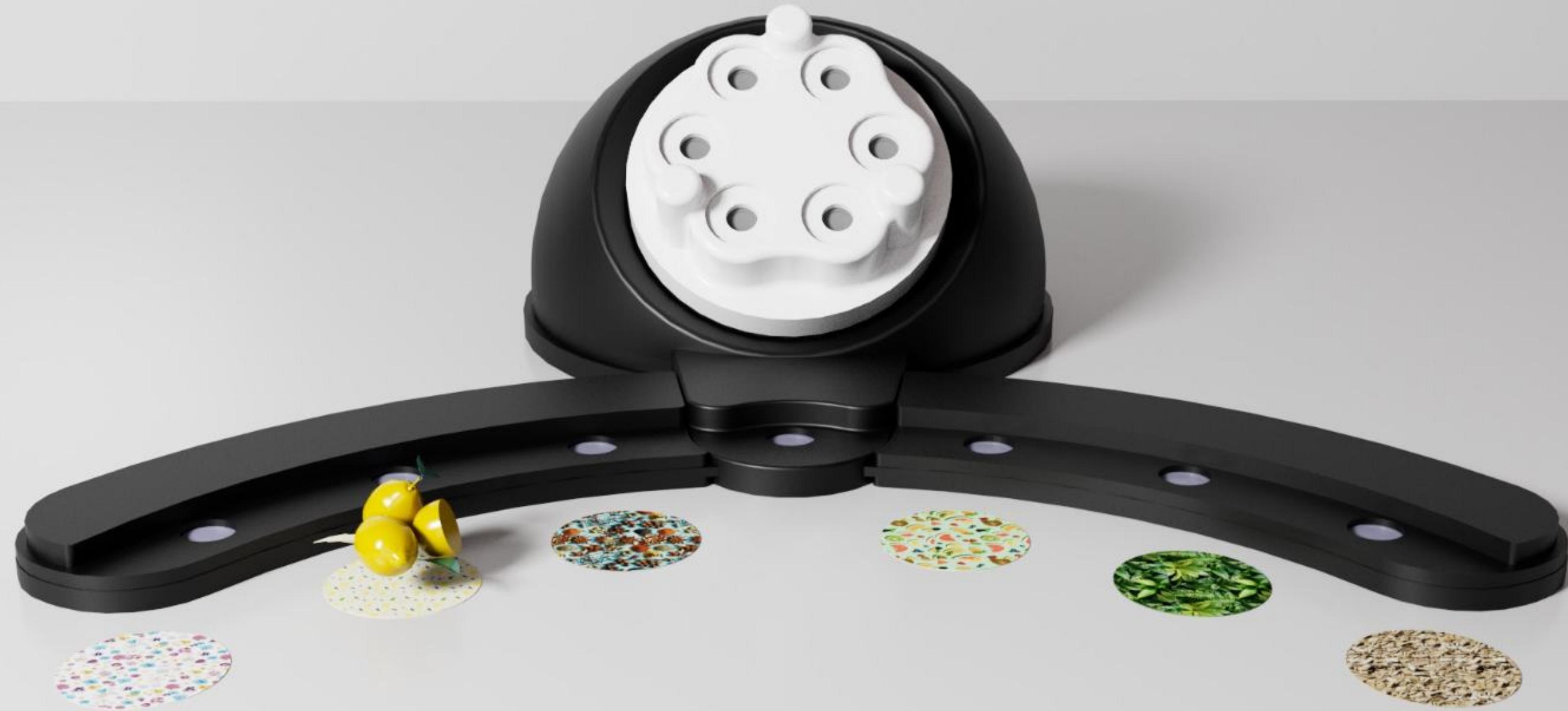
STEP I Scent Selection

Once the user is connected with the AR Environment he/she may select one of 6 scents. These can be combined.



STEP II Scent Selection

Once selected, the AR Icon enlarges and the scent is **SELECTED**.



STEP III Scent Information

By pressing the icon a **2nd time**, an **INFORMATION WINDOW** pops up - explaining the characteristics of the specific fragrance.





STEP IV Re-selection

By selecting the fragrance a 3rd time, it is
DESELECTED.

The user can then choose different scent/s.

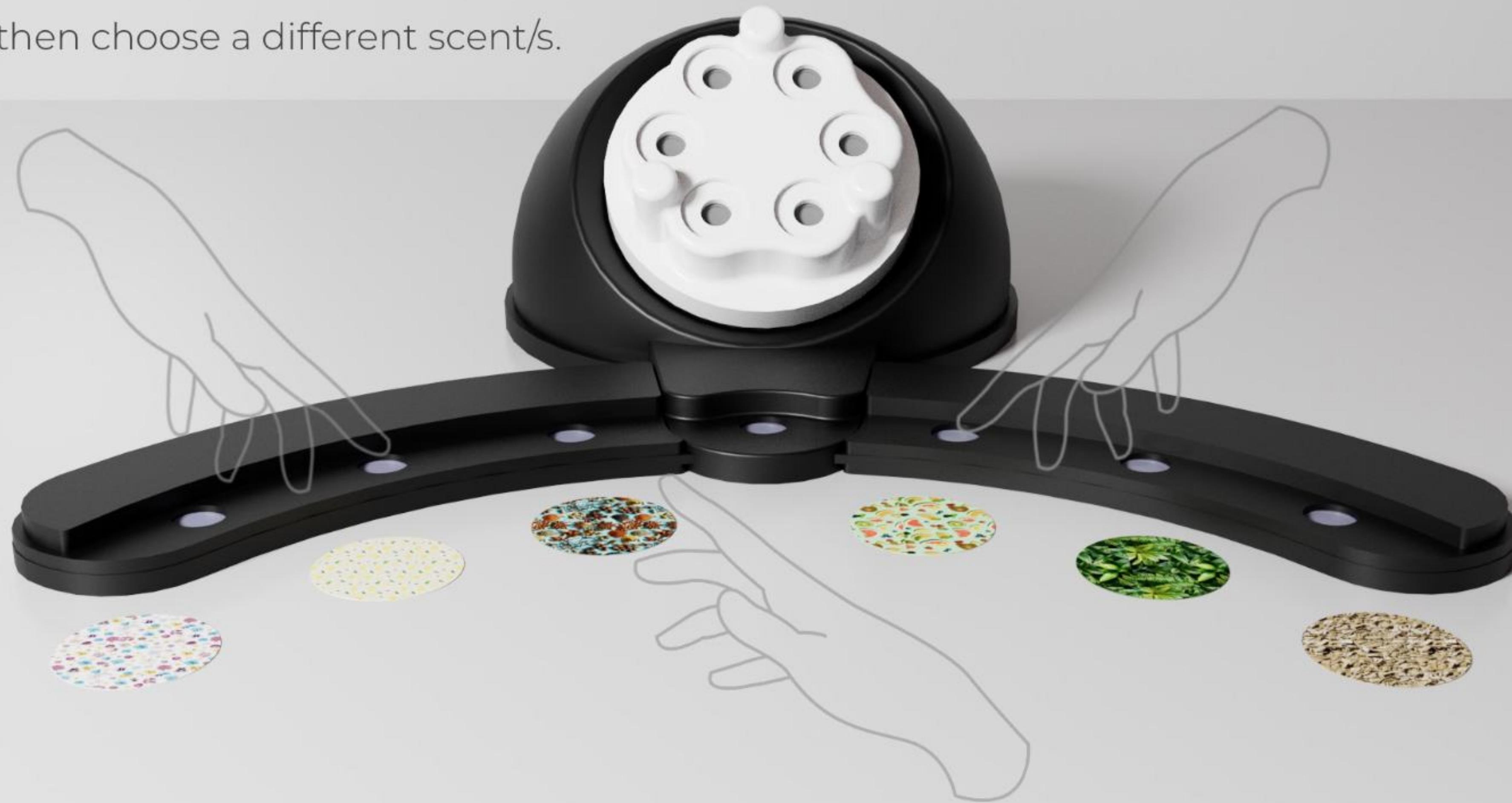




STEP IV Re-selection

By selecting the fragrance a 3rd time, it is
DESELECTED.

The user can then choose a different scent/s.





STEP IV Re-selection

By selecting the fragrance a 3rd time, it is
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STEP V Selection Input

The user may select a combination of up 6 fragrances by pressing the icon button once for each selection.



STEP VI Scent Dispersal

Once selected, the fragrant-specific atomisers are activated, dispensing a personalised perfume.

AR



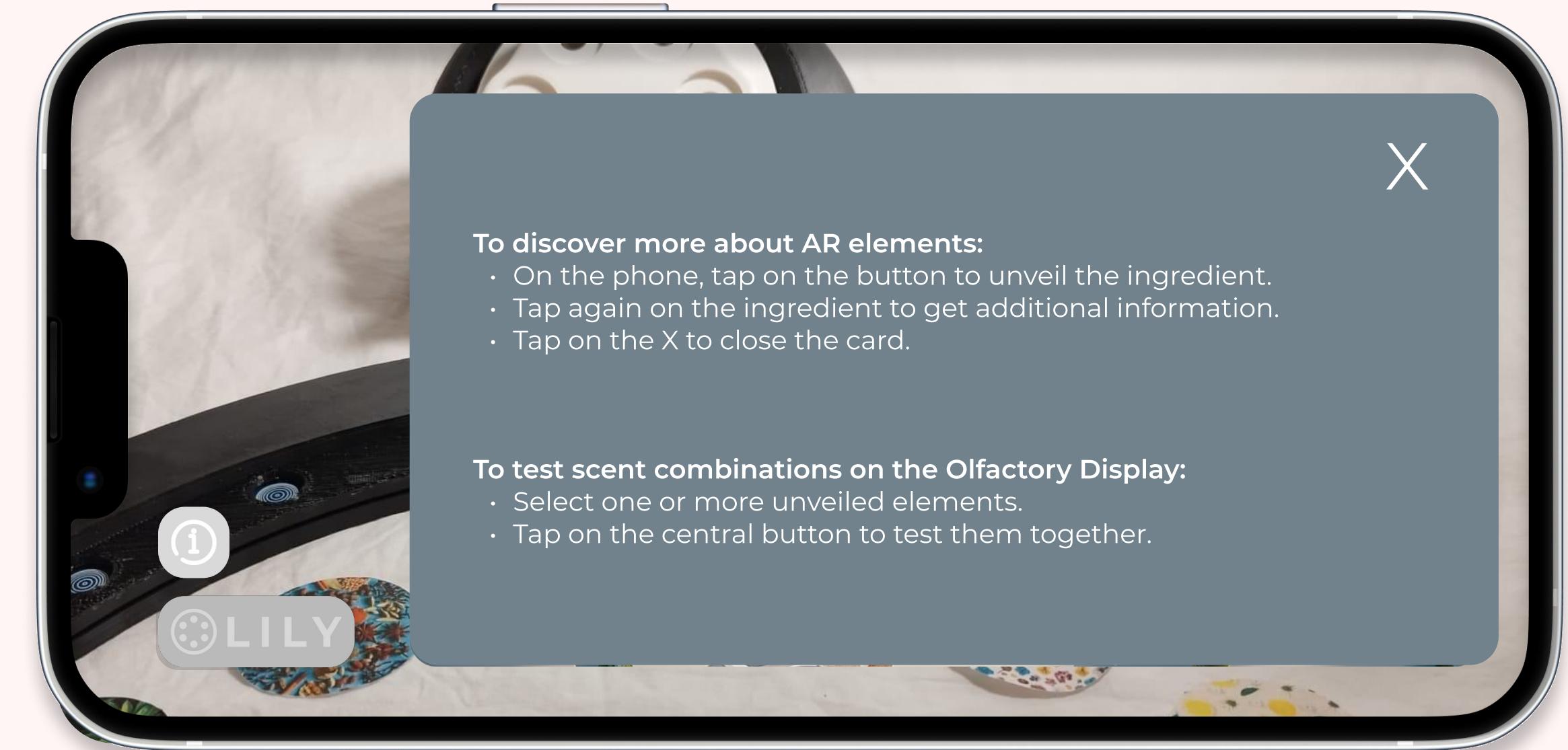
AR EXPERIENCE



Info Panel



Project Panel



FRAGRANCES



1. Floral

Common Scents: Rose, Jasmine

- Filling Components: Essential oil or fragrance oil
- Base: Ethanol (alcohol) for better evaporation and scent throw
- Additional Ingredients: Glycerin (for a slight moisturizing effect and improved longevity on the skin)



2. Citrus

Common Scents: Lemon, Bergamot

- Filling Components: Essential oil or fragrance oil
- Base: Ethanol for proper diffusion and lightness
- Additional Ingredients: Water (to balance the intensity and provide a more refreshing spritz)



3. Woody

Common Scents: Sandalwood, Cedarwood

- Filling Components: Essential oil or fragrance oil
- Base: Ethanol to help with even dispersion
- Additional Ingredients: Dipropylene glycol (DPG) for better blending and a smooth release



4. Spicy

Common Scents: Cinnamon, Clove

- Filling Components: Essential oil or fragrance oil
- Base: Ethanol to enhance scent diffusion
- Additional Ingredients: Polysorbate 20 (to emulsify the oil and water components, ensuring consistent spray)



5. Fruity

Common Scents: Apple, Pear

- Filling Components: Essential oil or fragrance oil
- Base: Ethanol for an effective spray and scent projection
- Additional Ingredients: Propylene glycol (to help dissolve the oils and improve stability)

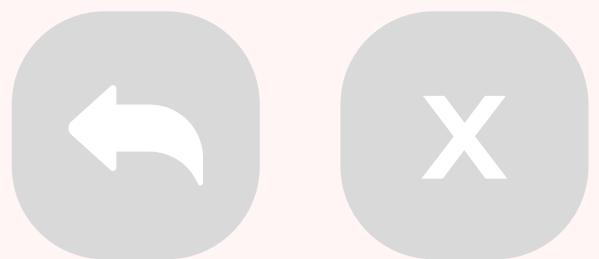


6. Green

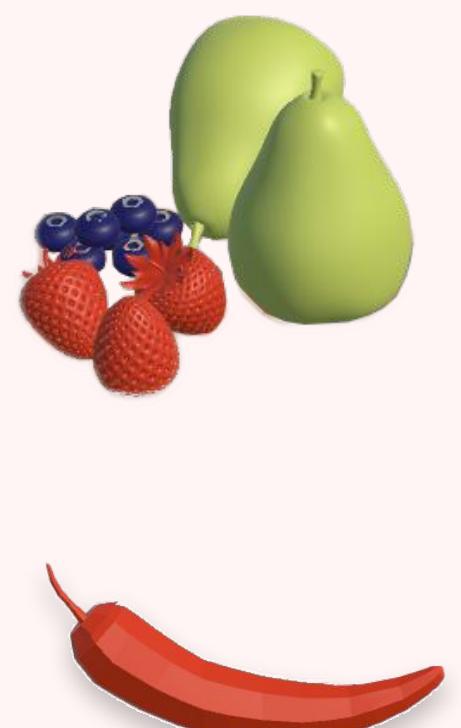
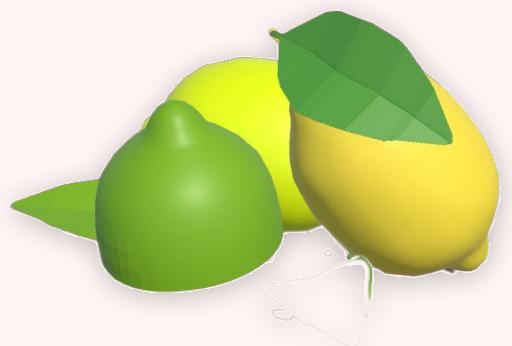
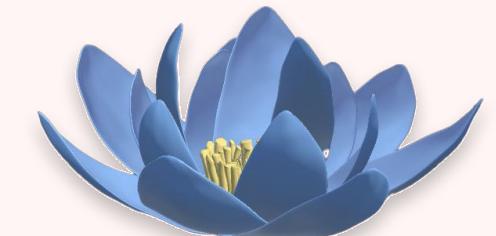
Common Scents: Cut Grass, Green Tea

- Filling Components: Essential oil or fragrance oil
- Base: Ethanol to aid in quick evaporation and clear scent presentation
- Additional Ingredients: Water (for a light, fresh finish)

Button controllers



3D objects



Floral fragrances are sensual, romantic, and suitable for both men and women. This versatile olfactory family combines well with citrus for freshness or with woody and spicy scents for intensity and mystery.



Citrus perfumes belong to the most sparkling olfactory family, creating a sensory journey of freshness, energy, and vitality. These fragrances are made with oils derived from squeezed citrus peels.



Fruity perfumes are known for their fresh, joyful notes. Modern fruity perfumes are versatile, complex, and tempting, balancing sweetness with intriguing base notes of spice and wood.



Woody scents evoke the sensations of pristine nature and a mysterious, intense opulence. Citrus notes often enhance woody fragrances, but they can be enriched by any other aroma.



Green fragrances are clean and revitalizing, often used for daytime wear. Combined with citrus, they are refreshing and energizing. Pairing with floral notes, the freshness is perfectly well balanced.



Spicy fragrances can be intense and opulent, making them challenging to wear. Often blended with citrus and aromatic shades, spicy notes add warmth and intensity to fragrances.

Cards



Visualize

On Click ()
= Runtime Only ARInteraction.CloseTextObject
floral (AR)

Default UI Material (Material)
Shader: UI/Default Edit

Navigation Automatic Visualize

On Click ()
= Runtime Only ARInteraction.CloseAll
floral (AR)

Inspector

1. Floral Static Untagged Layer Default

Prefab 1.Floral Overrides Select Open

Transform

Position X 0 Y 0 Z 0
Rotation X 0 Y 0 Z 0
Scale X 10 Y 10 Z 10

Animator

Box Collider

Edit Collider

Is Trigger
Provides Contacts
Material None (Physics Material)
Center X 0 Y 0 Z 0
Size X 10 Y 10 Z 10

Layer Overrides

Layer Override Priority 0
Include Layers Nothing
Exclude Layers Nothing

Add Component

Inspector

Use smooth transition

Event(s) when target is found:
On Target Found ()
List is Empty

+ -

Event(s) when target is lost:
On Target Lost ()
List is Empty

+ -

AR Interaction (Script)

Script # ARInteractionHandler

Three D Object 1.Floral

Text Object info

Close Button x

Back Button indietro

Box Collider

Edit Collider

Is Trigger
Provides Contacts
Material None (Physics Material)
Center X 0 Y 0 Z 0
Size X 80 Y 80 Z 100

Layer Overrides

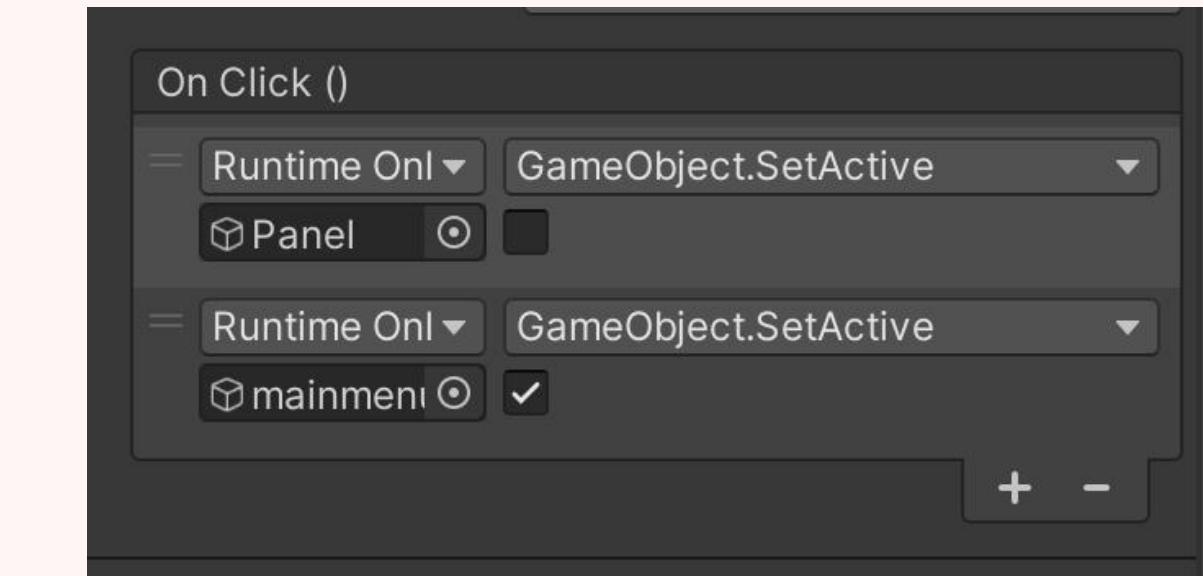
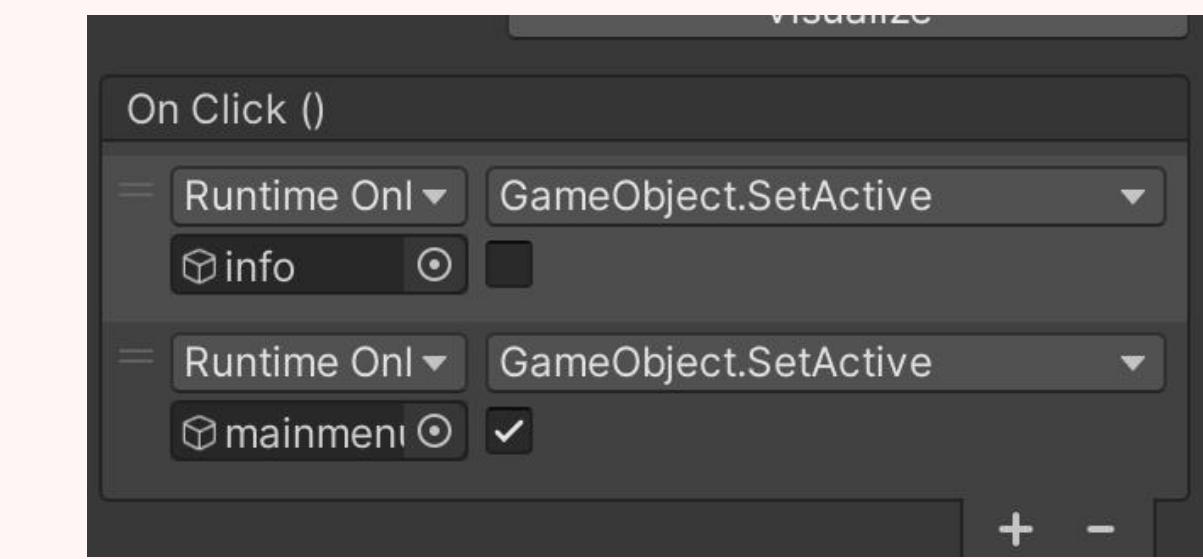
Layer Override Priority 0
Include Layers Nothing
Exclude Layers Nothing

Image Target Preview (Script)

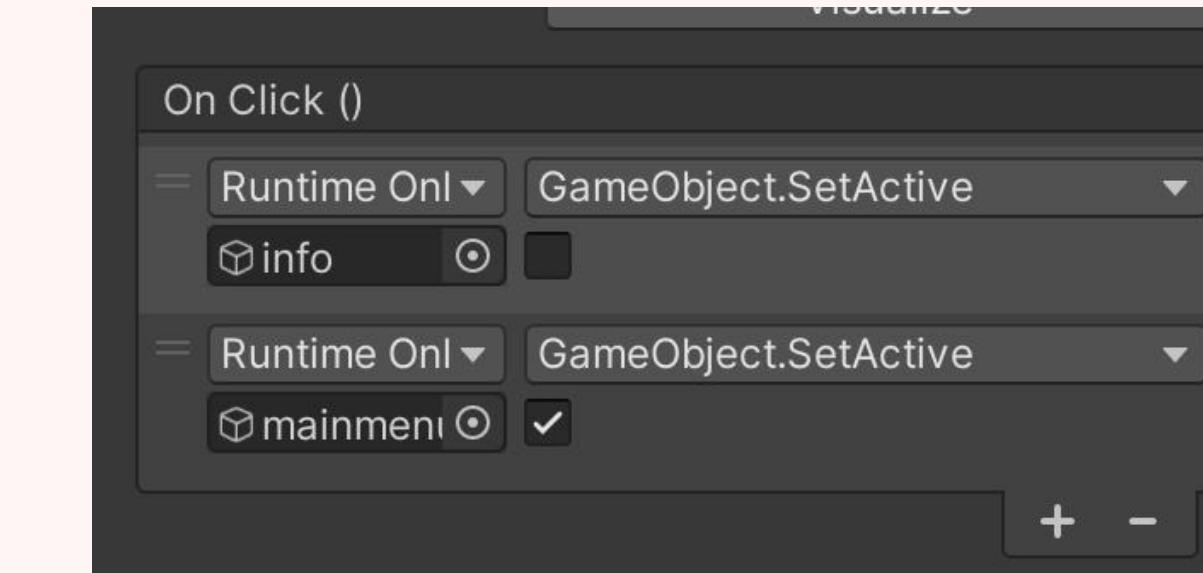
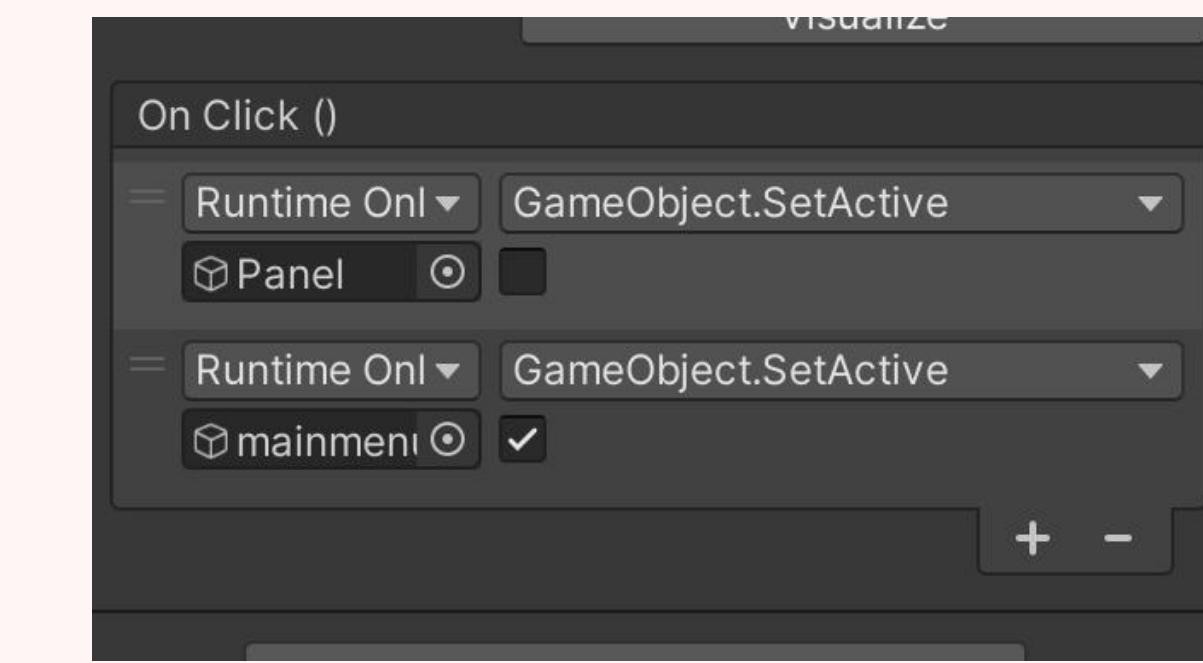
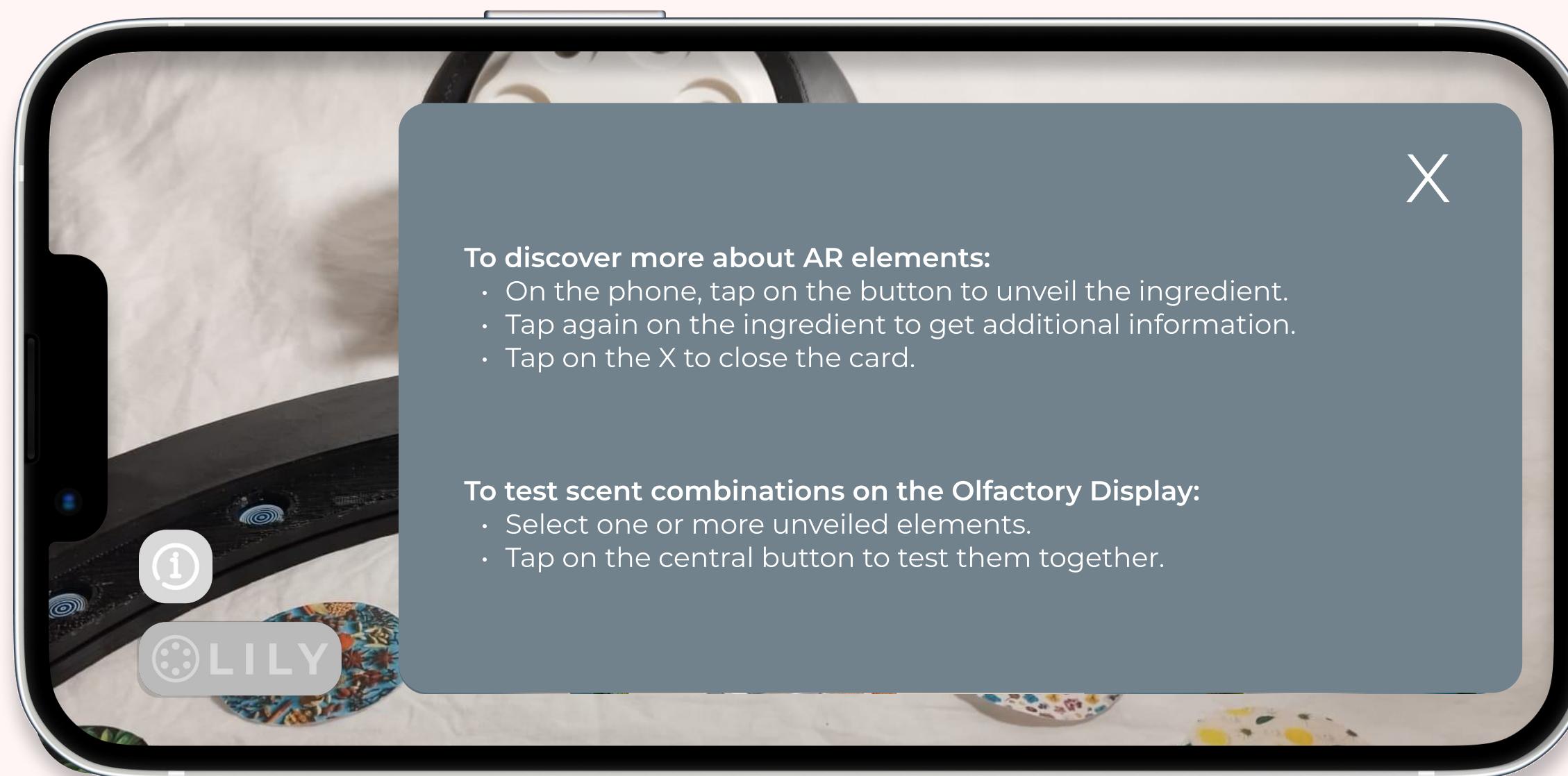
Enable Visualization

Add Component

Info/Project info



Info panel/Project panel



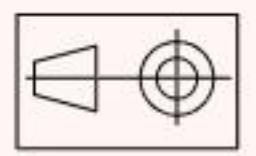
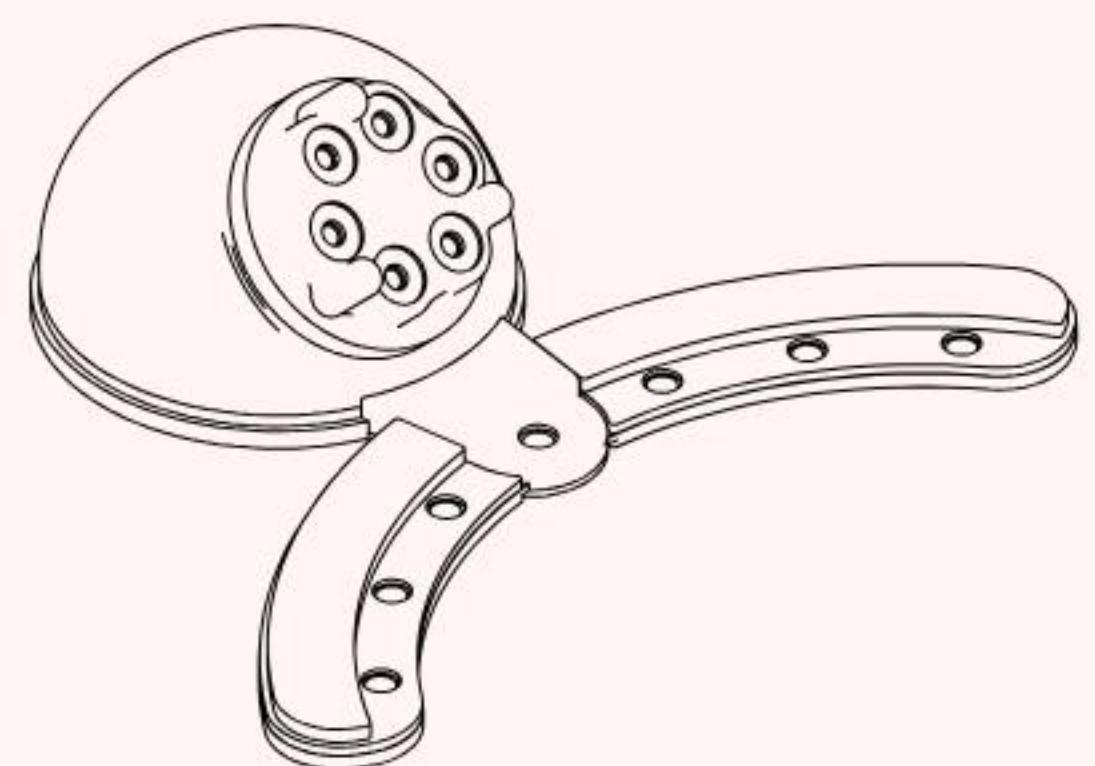
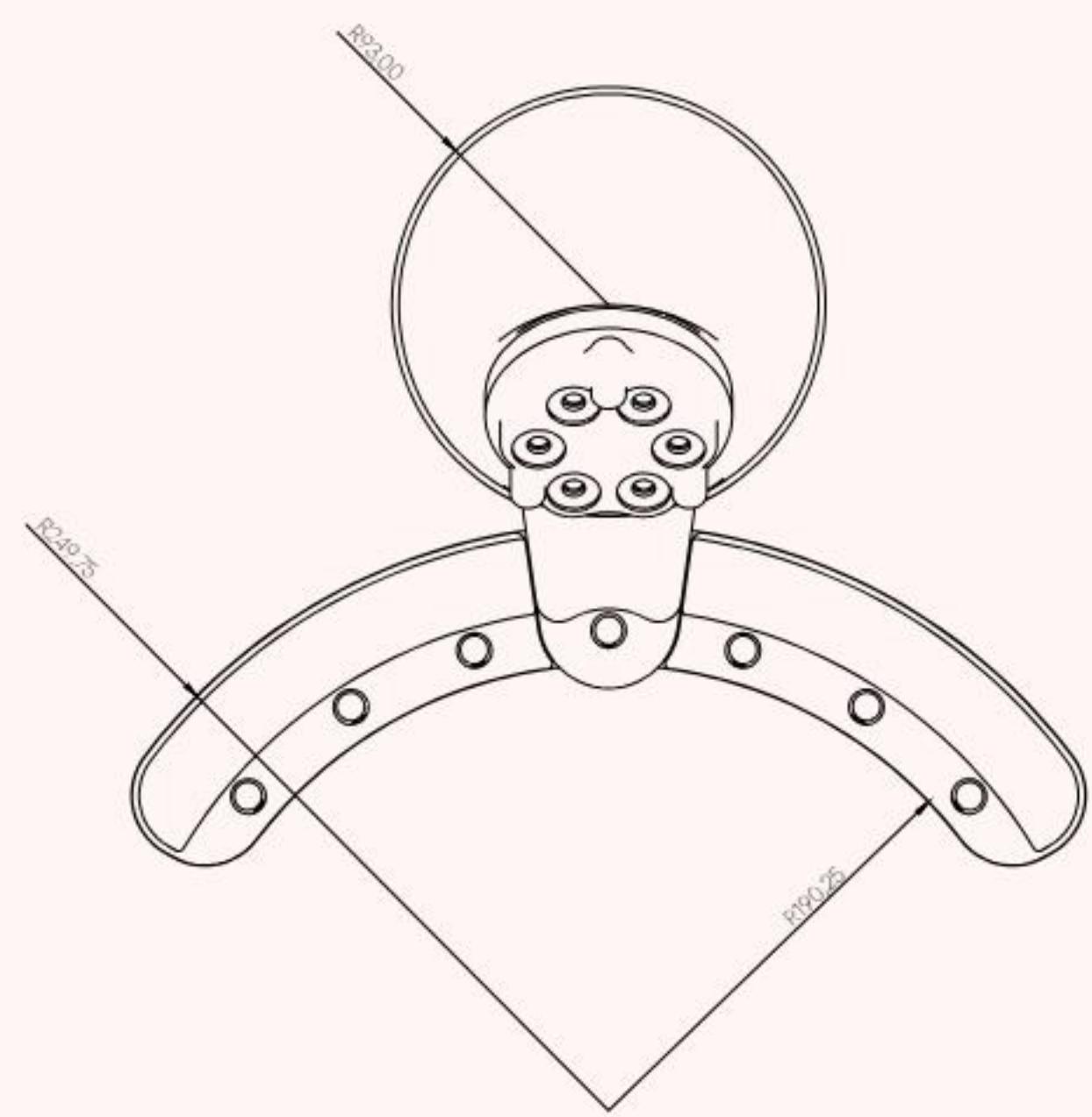
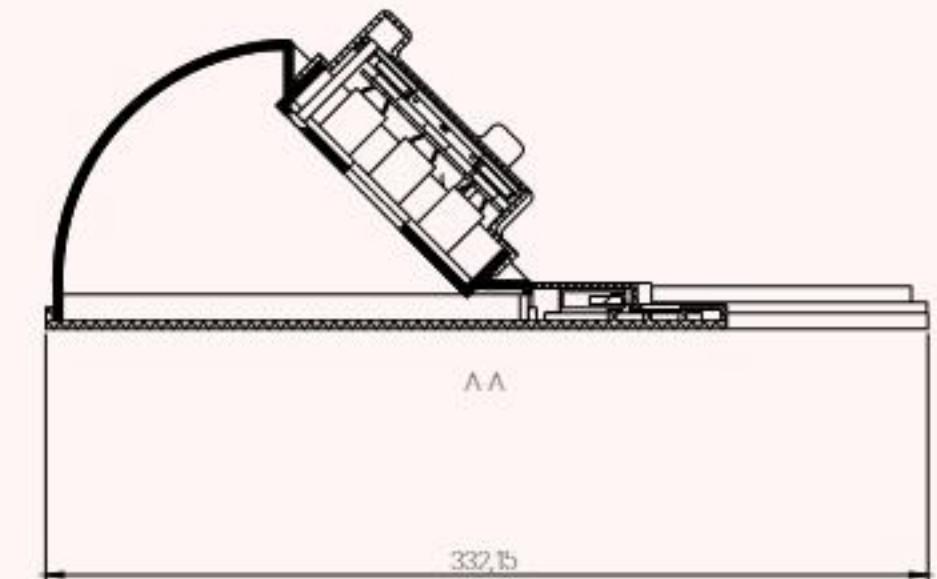
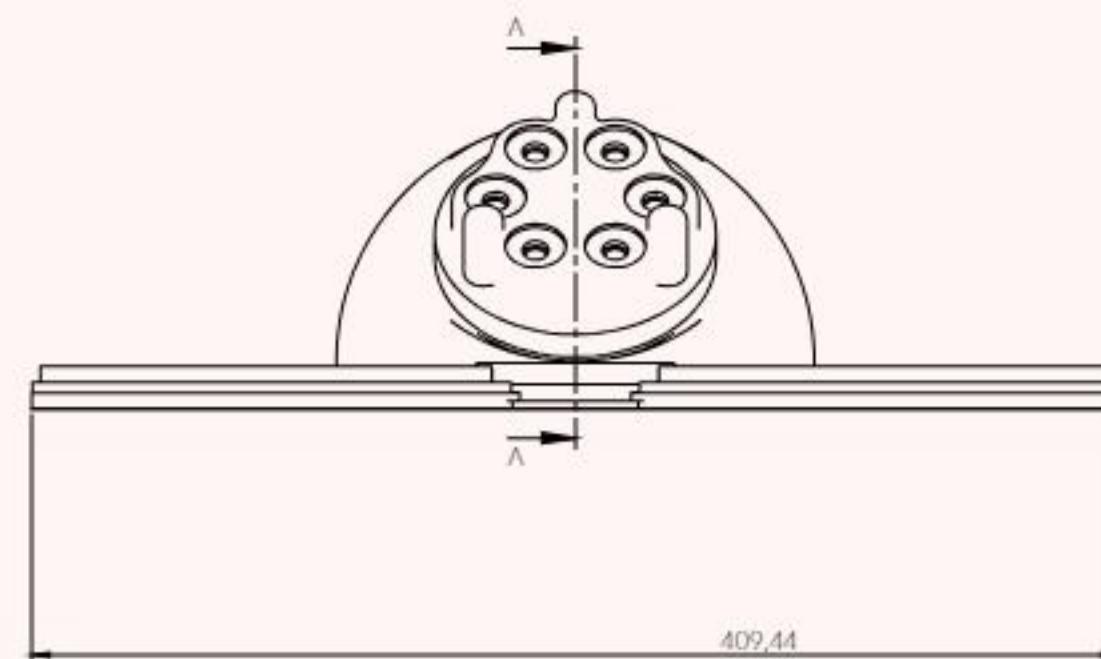
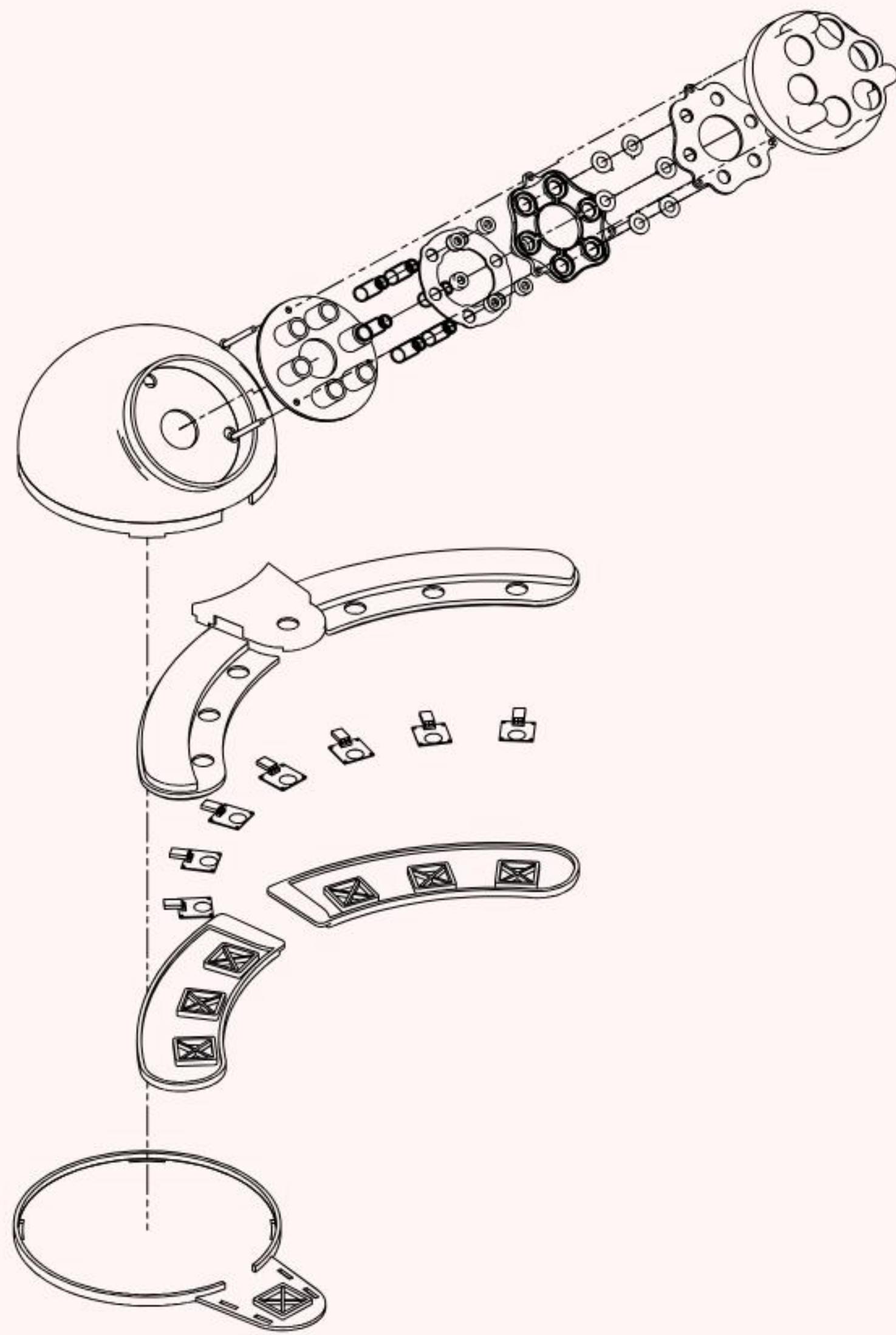
TECHNICAL APPROACH





EXPLODED VIEW

TECHNICAL DRAWINGS



DEVELOPMENT PROCESS

VERSION I

- Determined 45° to user
- Removable nozzle
- Unnecessarily large
- No control Interface
- Inspired by Lily



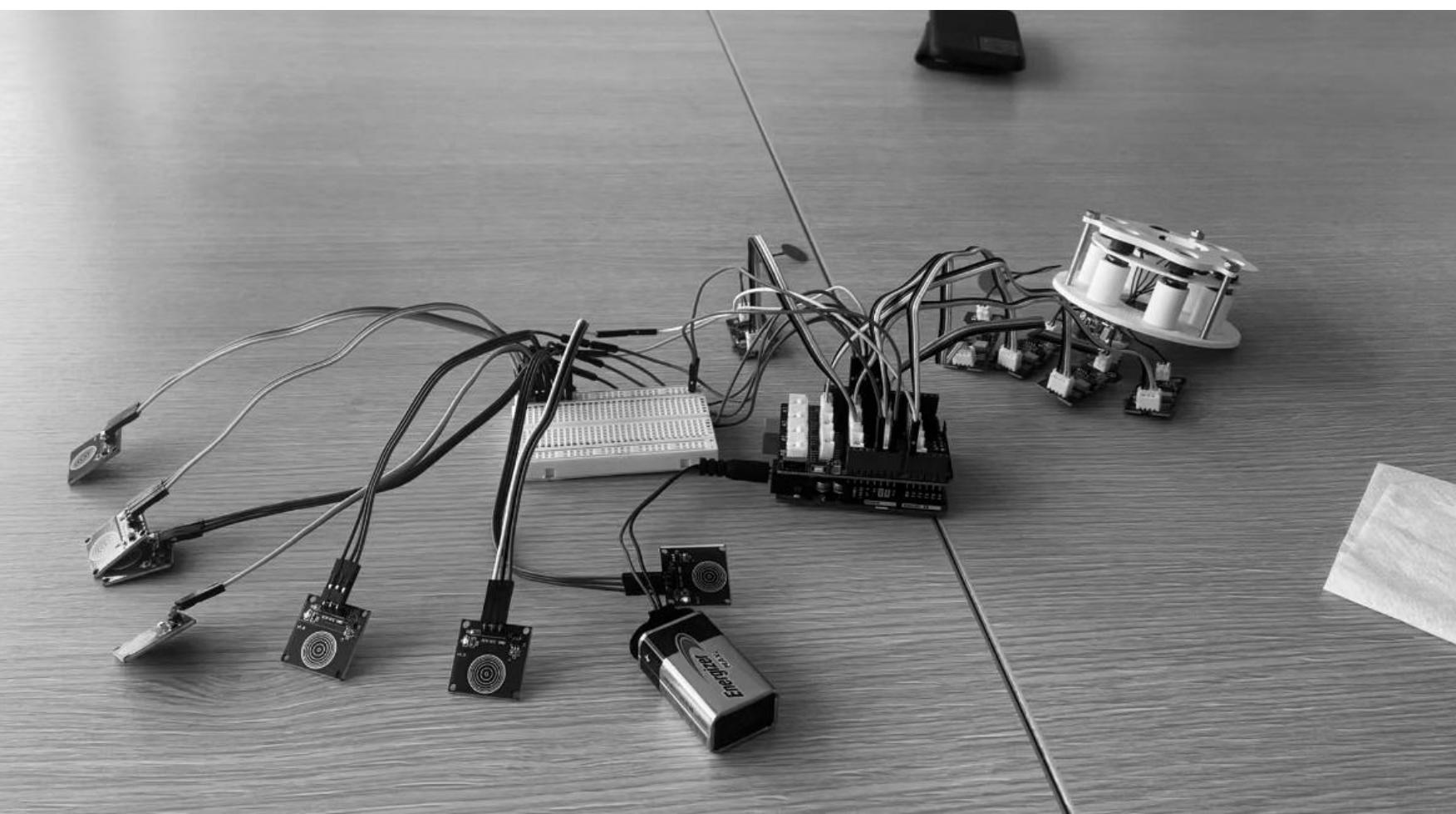
VERSION III

- Decreased size
- First semi-circular interface
- Only atomisers removable, but difficult
- Finding: 3D printed parts not suitable as cartridges
- Interface not optimal for interaction



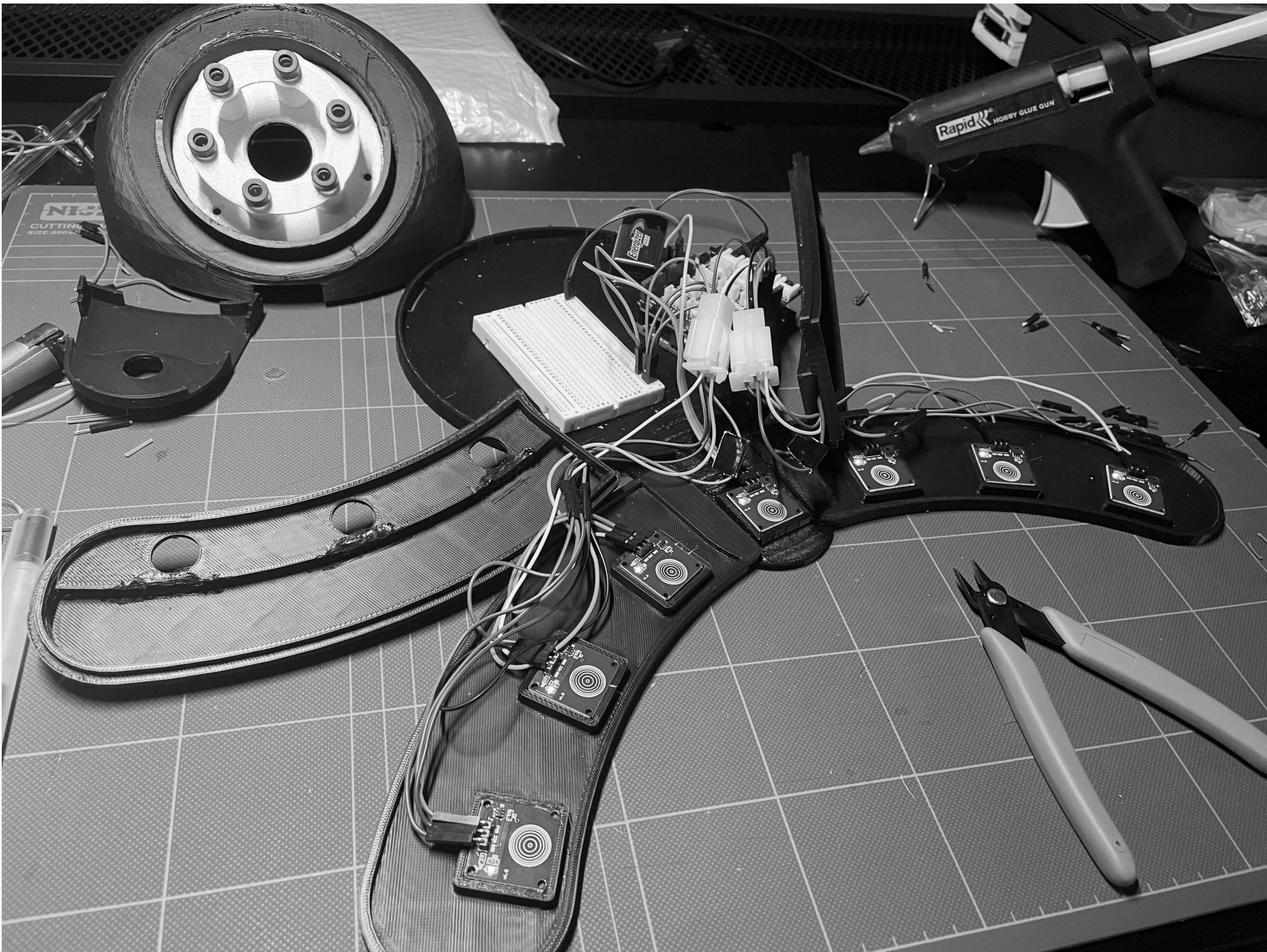
VERSION III

- Focus on Nozzle
- Nozzle fixed and easily disassemblable
- Cartridges & atomisers can be taken out as one
- Dimension error, atomiser caps would not press-fit
- **New Cartridges prevent spillage**
- Introduction of capacitive touch sensors
- **Success:** First successful code test with all components

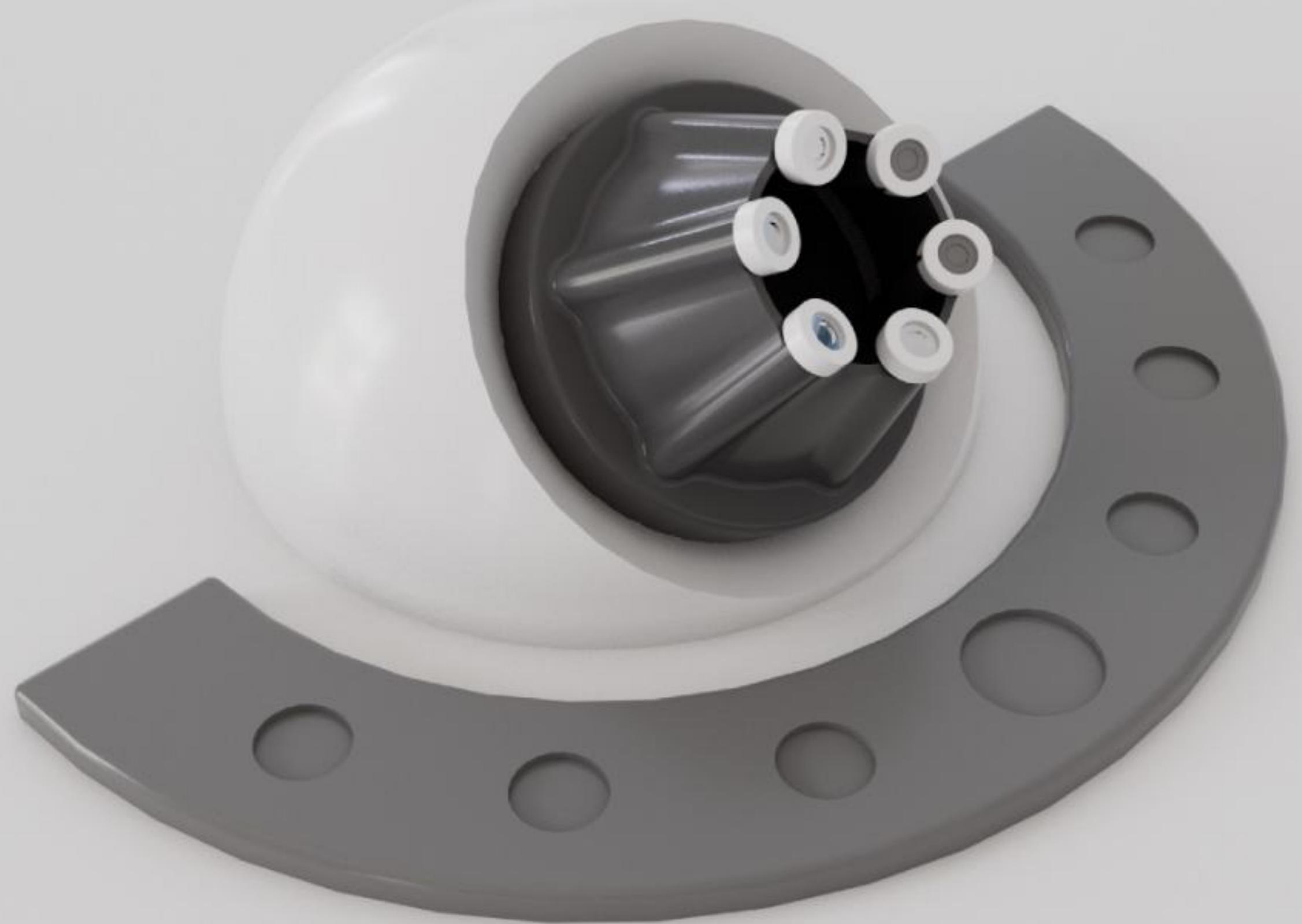


VERSION IV

- Final Design
- Integration of all components in 3D-printed hull
- **New atomiser plate keeps them in place**
- **Control-Board split in 2 & connected by single plug for easy disassembly**
- **Nozzle Cap hides screws**
- **Press-fitted design for easy separation**
- **Successful code test with all components**



OLD



NEW



VIDEO 2

**THANKS FOR
YOUR ATTENTION**