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CART 360
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# Project Proposal

## Project Description

Our project explores expressive interfaces. We aim to question, analyze and visualize the effects of sounds (nature, environmental, relaxing, noises, etc.) on our reactions and interactions.

To elaborate, our project immerses the explorer in a sonic experience that stimulates the user. The user will be invited to react and express their feelings while the sounds are being played by interacting with a stretchy fabric (interweaved with sensors) with a small tensile structure. We believe the nature of the sounds, whether calming or aggravating, would impact how the explorer will interact with the textile. The user can explore a couple of touch gestures, such as pressing, punching, smoothly sliding fingers over it and more. These gestures/interactions will be translated visually on a screen through colours and shapes. The experience and the outcome would be distinct abstract imagery based on the user's interaction.

Based on the nature of the sounds, the project could be installed in open public spaces or placed inside more reserved and closed spaces where sonic stimulation will be done digitally. The outcomes could bring opportunities for public exhibitions where these abstractions are recorded and displayed, or they could be used as visual data to explore human behaviour and in surveys. The target user is not limited to a specific group; the experience is open to anyone with the curiosity to explore.

The experience will bring closeness and consciousness to how we might unconsciously react to the effect of sonic stimuli and our environments by visualizing and translating the interactions into more understandable data.

As the experience encircles a variety of possibilities, the artifact would either challenge or help the user based on their chosen sound ( if played digitally). A more relaxing sound would help the user calm down and have a rather pleasing experience, while conversely,

noises and environmental ambient sounds might be more provocative and challenging. Ultimately, both scenarios would help the user be more conscious of their reactions. As an intentional design strategy and to invite the user to interact with the artifact, it will be installed in public spaces or interactive exhibitions so that the context would represent its use clearly. Moreover, the artifact would provide a welcoming structure and accommodate the user for their experience.

## Electronic Component Evaluation

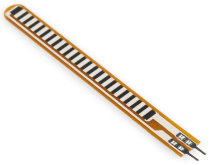
Part one: haptic/movement sensing

- Ultrasonic sensor: detect movement based on the position and distance.

source: https://i5.walmartimages.com/

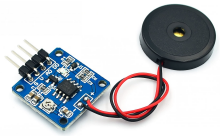
- Resistive/capacitive sensing materials and e-textiles: detect pressure, bending and stretching actions.


conductive surfaces, source: https://content.instructables.com


flex sensor, source: https://www.teachmemicro.com


force sensor, source: https://www.amazon.ca

- Force sensor: detect the level of force applied to the material


shock/tap sensor, source: https://ae01.alicdn.com

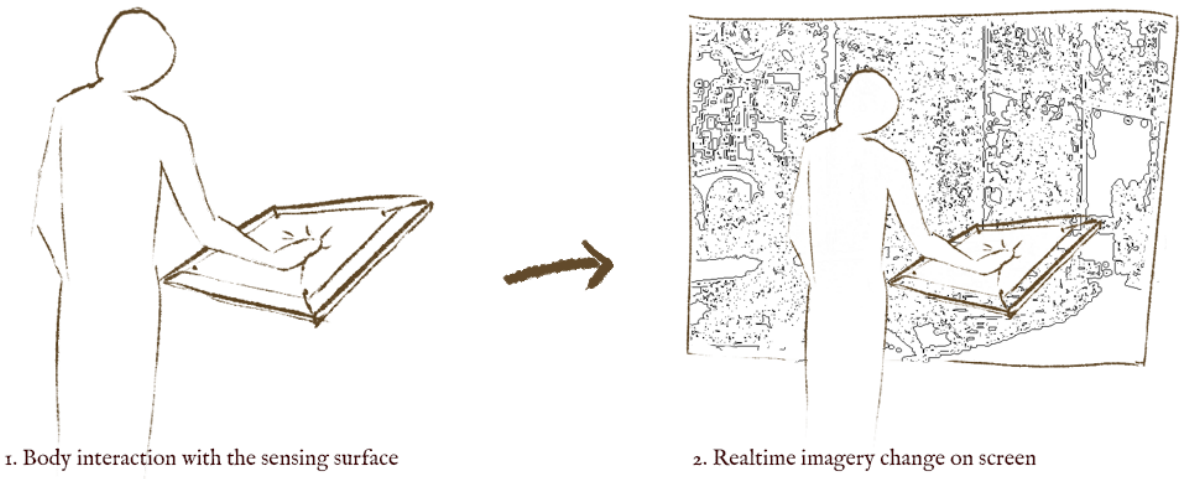
Part two: visual and audio output

- Audio: A soundtrack from a pre-made list chosen by the user and played by TouchDesigner.
- Visual: using the information retrieved from the sensors as variables to produce changes in computer-generated imagery with TouchDesigner.

The sensing components in the circuit are paired with the output components in order to create a self-regulating system that, in this scenario, represents the spirit level. Similar to our tangible world, internal and external forces applied to a spiritual world/entity affect its behaviour. The commonality in fluid and organic transformation is a theme we decided to explore in our interaction system. Since humans embody both tangible and spiritual realms very well, we chose to center the interaction on our digital self-regulating system with the human learning system to portray how tangible influences travel to the spiritual level and vice versa.

The sensing artifacts are used as a single-way connection from the tangible to the spiritual world, while the human's sensory organs connect with this computer-generated spiritual portrayal.

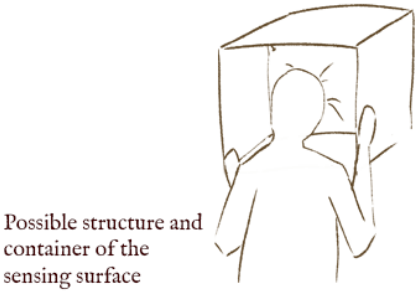
### Illustration of the storyboard



1. Body interaction with the sensing surface

2. Realtime imagery change on screen

Sensing Surface, microcontroller and computer



Possible structure and container of the sensing surface

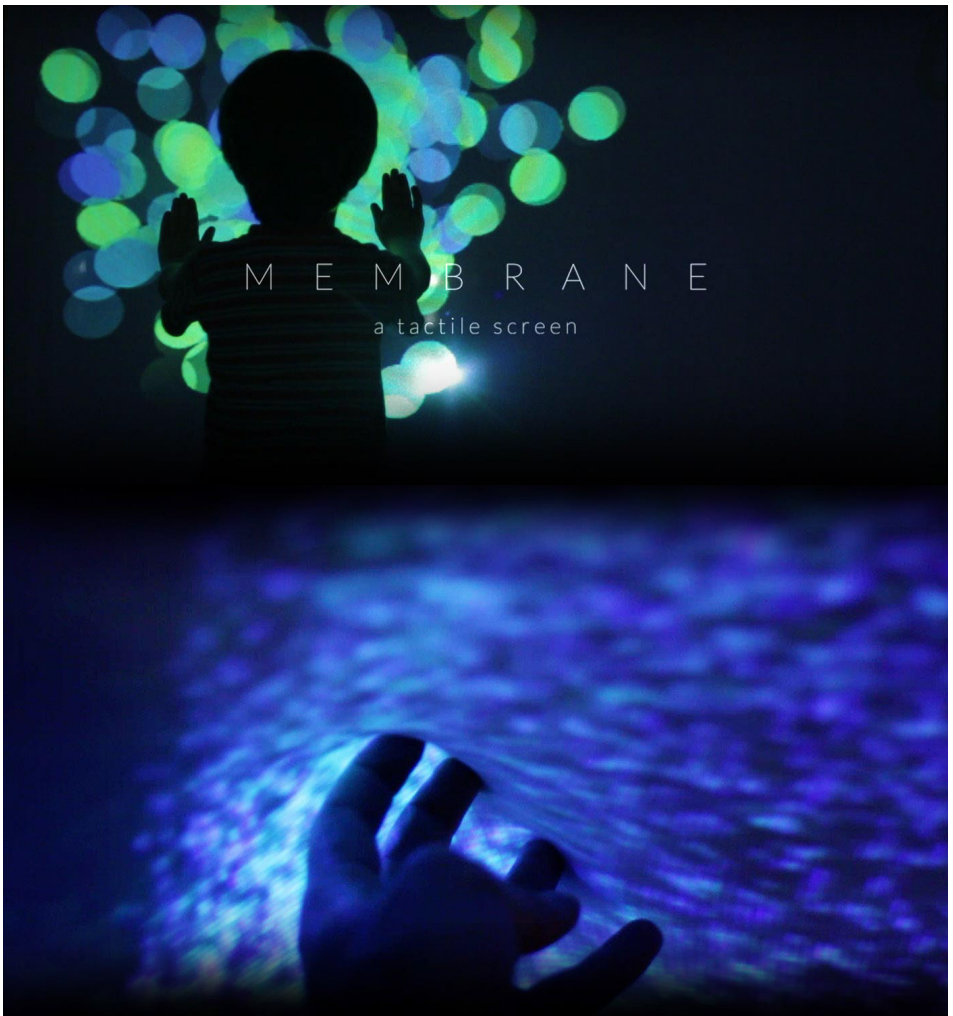
While a background soundtrack plays, people can interact with the sensing structure with any part of their body in any way: they could punch it, swipe it, poke it, or put their head on it to imagine the structure as an entity they are conversing with. Those interactions will bring changes to the generated imagery so they can visualize the internal processing of this entity.

## Inspirational projects

Our chosen projects explore various aspects of our concept. Below you can find projects manifesting visuals, touch design or mood visualization in immersive environments, which collectively compose our idea.

- **Membrane - an interactive textile experience by MELT**

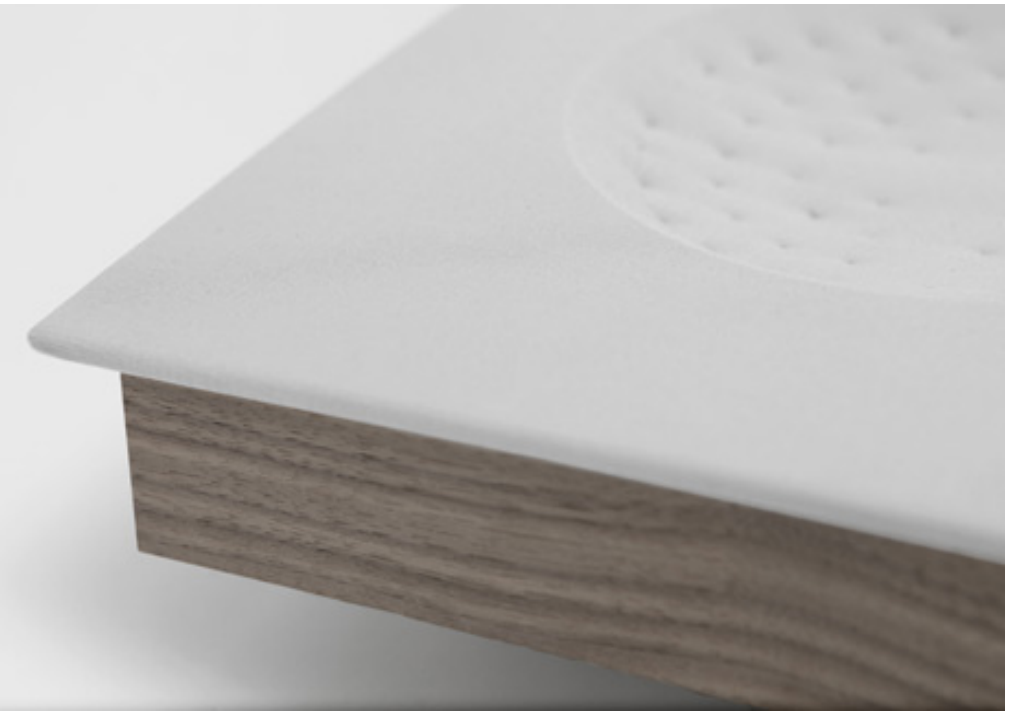
Membrane is a human-size and tactile touch screen made of fabric and designed by MELT. This interactive installation brings a lifelike technology that reacts and responds to touch. In this installation, the organic structure and the feel of the fabric to the touch, coupled with sound generation by analyzing the pressure of your touch, generates distinctive audiovisual explorations (MELT). (link to the video: https://vimeo.com/67897675?embedded=true&source=vimeo_logo&owner=4990387)



- **TTI by Eunhee Jo**

This artifact is a tactile speaker. The designer has employed a fabric control panel and speaker that moves with the sound of music, a distinctive approach to traditional speakers. With the control panel (on the right) for this Tangible Textural Interface (TTI) speaker and using a variety of hand gestures, the user can adjust the volume, skip tracks and more. On the other side of the speaker, the surface pulsates and responds according to the beat of the music (Emilie Chalcraft, *Tangible textural interface by Eunhee Jo at show RCA 2012*). (link to the video:https://vimeo.com/44646607)

The control pad and hand gestures



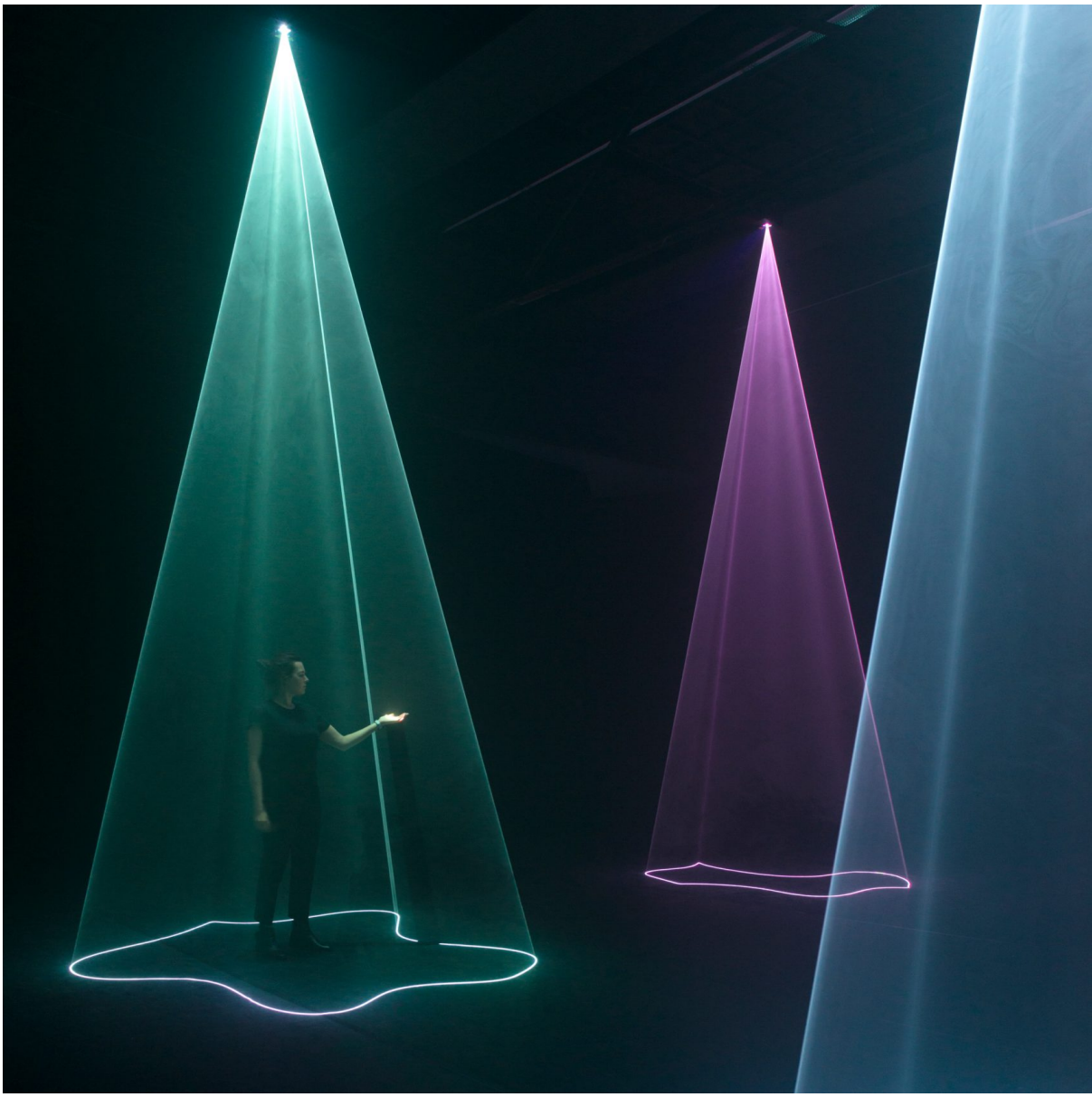
The speaker part
that moves and reacts to the beat

- **Aura installation by Studio Nick Verstand**

Aura is an immersive audiovisual installation that materializes and translates emotions into light compositions. To capture the visitors' emotions while interacting with the installation, they were equipped with biosensors that captured brainwaves, heart-rate variability, and galvanic skin response. Music was employed to trigger emotions, and then the visitor's emotional data was analyzed and reinterpreted into diverse light beam colours, forms and intensities projected onto them. This installation manifested the emotional interaction visible to other visitors (Ali Morris, *Audiovisual installation transforms emotions into beams of light)*. video link: (https://www.youtube.com/watch?v=8FkBA3xTne0&feature=emb_imp_woyt&themeRefresh=1)

visitor interacting with the installation

The installation responding to each visitor's emotional data with distinct light colors



**What's unique about our project?**

Our project encircles the methods and strategies discussed in our inspirational projects in a collective way. It explores touch design and fabrics, data visualization, installations, immersive audiovisual experiences and experiences that bring consciousness to our unconscious reactions. It could either be an exploratory experience or an experience designed for surveys regarding sound effects on reactions. Either way, it is a tool that brings mindfulness to our feelings and the sonic environment we are surrounded by through playful interaction.

## Works cited

Ali Morris |25 November 2017 12 comments. “Audiovisual Installation Transforms Emotions into Beams of Light.” *Dezeen*, 12 Jan. 2022,www.dezeen.com/2017/11/25/aura-installation-translates-emotions-into-beams-of-light-studio-nick-verstand-dutch-design-week/.

Emilie Chalcraft |28 June 2012 4 comments. “Tangible Textural Interface by Eunhee Jo at Show RCA 2012.” *Dezeen*, 12 Feb. 2022, www.dezeen.com/2012/06/28/tangible-textural-interface-by-eunhee-jo-at-show-rca-2012/.

“Membrane Experience - by Melt - Virtual Reality & Multimedia Experiences.” *EXPERIENCE - by MELT - Virtual Reality & Multimedia Experiences*, MELT, www.bymelt.com/portfolio/41-membrane_experience.