

Extending the Akkaplatta Movement Experience

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ABSTRACT

A design project was conducted to design new sensory experiences for the “Centrum för sinnesstimulering” in Stockholm using soma-design related practices and methods. The process and resulting design presented in this pictorial was influenced by the somatic experience of being in the woods and the interplay between moving the body and the world around it. The design seeks to enhance existing technology at the center by providing a sensory experience based on the experiences of the designer. The technology enhanced is the device called Akkaplatta, which allows people to drive their wheelchairs around a predetermined track. The experience of movement in the forest was translated to the Akkaplatta context through the use of visuals moving with parallax and accompanying soundscapes. The visuals moved according to the movement of the user on the Akkaplatta and the soundscapes were triggered by stopping underneath the visuals, enhancing the sense of control moving and stopping gives the user.

Author Keywords

Soma design; Akkaplatta; Control; Movement;

CSS Concepts

•Human-centered computing~Interaction design~Interaction design process and methods

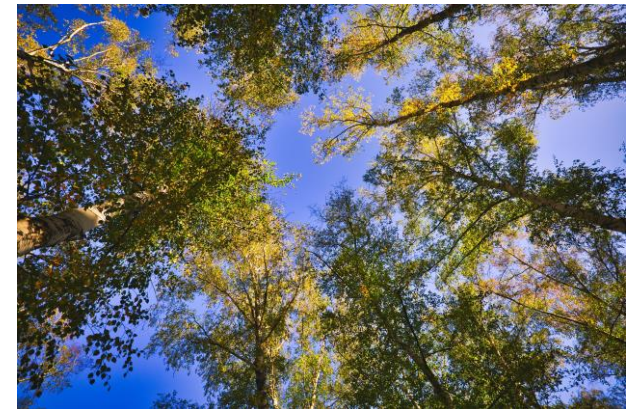
INTRODUCTION

This pictorial details a design project conducted with “Centrum för sinnesstimulering” (or “Center for sensory stimulation” in English) using soma-design practices. Soma design has its roots in the theories of Shusterman about somaesthetic appreciation, which Höök et al. [3] incorporated into the strong concept they call somaesthetic appreciation design. They wanted to bring in the lived body into established theory of embodied interaction design.

Soma design practices revolve around building interactions and experiences that stem from lived and felt experiences of the designer themselves, Höök et al. explores this first-person perspective in [2]. By paying attention to the soma during the design process the experiences gathered serves a dual purpose of fine tuning the designers somaesthetic appreciation as well as providing ideation and influence for the design itself.

This design project was heavily influenced by the felt experiences had when walking through a Scandinavian forest. The interplay between movement of the body

in the woods and the flora and fauna itself was used as a basis for extending sensory experiences had when using the Akkaplatta device at the center. The center aids in habilitation for people who have multiple disabilities that affect cognitive- and/or motor-function, the Akkaplatta is one of many of the available experiences at the center that revolves around movement.



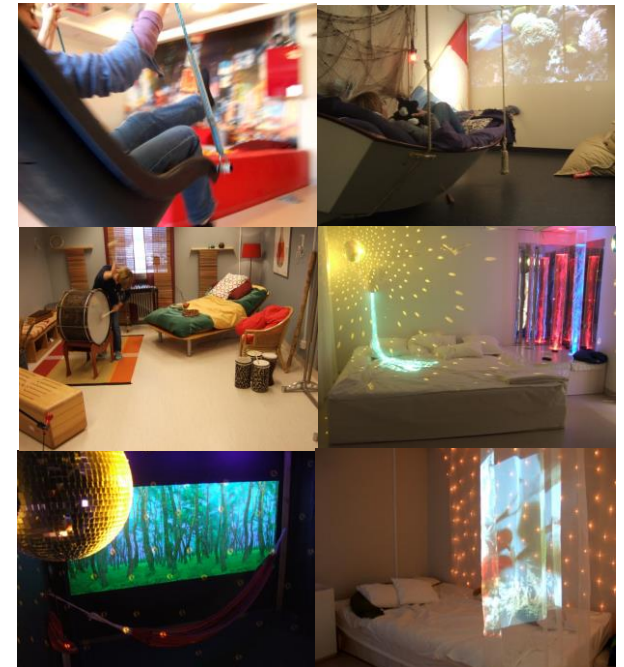
DESIGN BRIEF AND EXPLORING THE DESIGN SPACE

This project focuses on designing for people with severe intellectual disabilities, for whom many has some sort of motor function impairment. The design should be directly or indirectly in line with the mission of the Habilitation services of the Stockholm region. They describe this mission as maintaining or developing (for their patients) motor functions, communication, social abilities, cognition and generally the ability to navigate through everyday life. The design was also supposed to incorporate, and/or reflect about, somaesthetics potential role in designing for disabilities.

The first introduction to the design space happened through a guided telepresence tour of the facilities of the center for sensory stimulation. Due to precautions regarding the SARS-CoV-2 outbreak of 2020 a visit to the center required symptom-free visitors, which I could not participate in.

At the center there are themed rooms that provide a multitude of interaction and relaxation experiences. These rooms are connected through a corridor that houses what is called “Slingan”, a track for a device called the “Akkaplatta”. The Akkaplatta facilitates control of starting, moving, and stopping for wheelchair-using patients who may not be able to have this control otherwise. It is also used for training patients and companions in using the technology, so that they potentially could utilize it in their homes.

One aspect of what the center staff introduced as important was the relation between cause and effect in the experiences at the center. Ideally a small amount of cause, or user input, would result in a much larger amount of effect, or feedback from the experience.



All images on this page are of the center and are courtesy of [Habilitering.se](https://www.habilitering.se)

Sensations

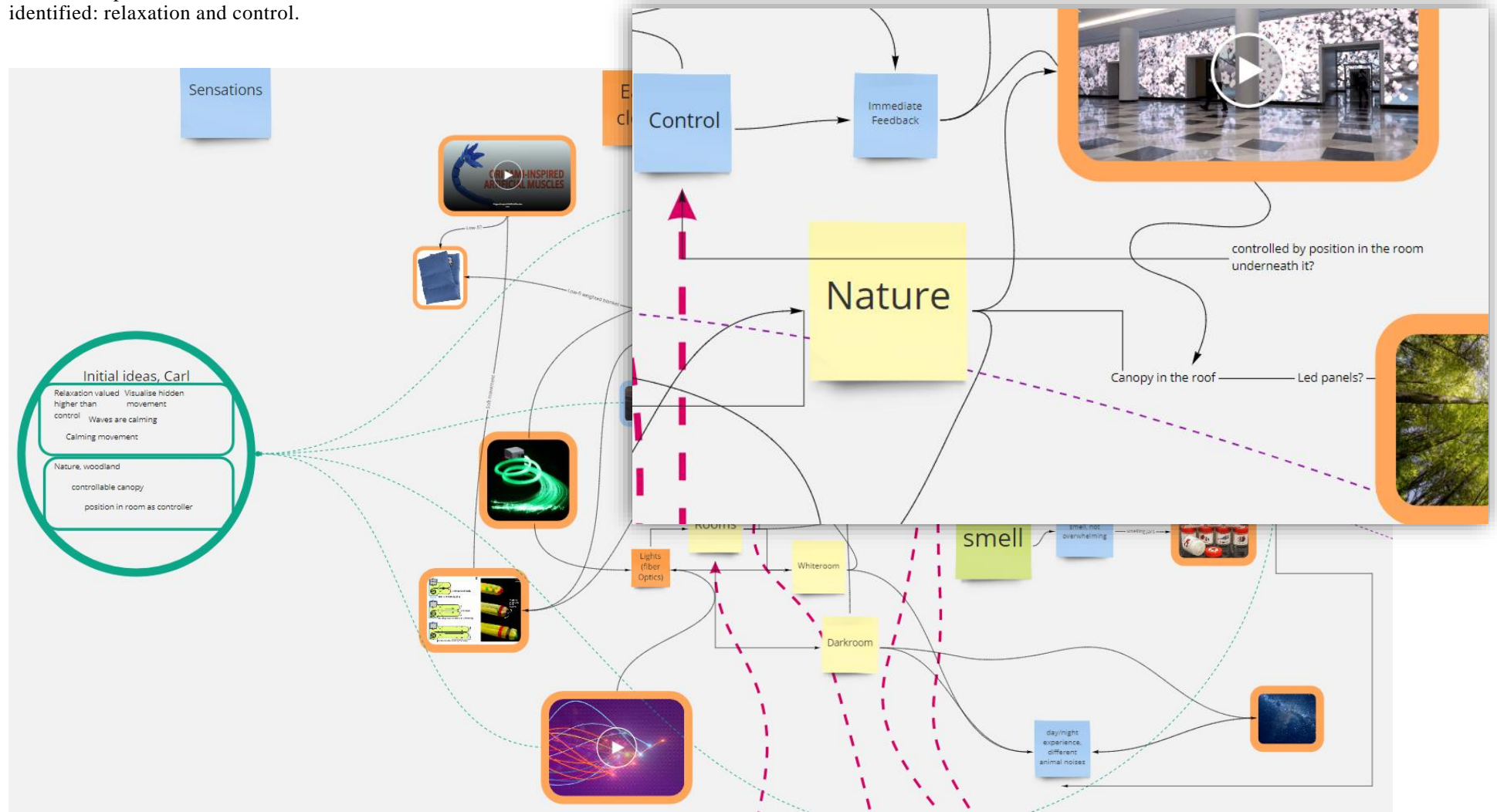
Initial ideas, Carl

- Relaxation valued higher than control
- Visualise hidden movement
- Waves are calming
- Calming movement

- Nature, woodland
- controllable canopy
- position in room as controller

Low IT

The diagram is a complex conceptual map with several interconnected nodes and flows. At the top left, a blue box labeled "Control" is connected by a solid arrow to a blue box labeled "Immediate Feedback". A curved arrow points from "Immediate Feedback" back to "Control". To the right of these is a large yellow box labeled "Nature". A solid arrow points from "Nature" to "Control". A thick, dashed red arrow points from "Nature" down towards a cluster of boxes at the bottom. This cluster includes an orange box labeled "Lights (Fiber Optics)", a yellow box labeled "ROOMS", a yellow box labeled "Whiteroom", and a yellow box labeled "Darkroom". A solid arrow points from "Lights (Fiber Optics)" to "Whiteroom", and another from "Whiteroom" to "Darkroom". A solid arrow points from "Darkroom" back up to "Nature". A thick, dashed red arrow points from "Darkroom" down towards the bottom right. On the left side, there are four small, rounded rectangular images with orange borders. The top one shows a play button icon and the text "INSPIRED MUSCLES". The second one shows a green, glowing, coiled fiber optic cable. The third one shows a play button icon and the text "INSPIRED MUSCLES". The bottom one shows a play button icon and the text "INSPIRED MUSCLES". Various other lines, including solid black, dashed green, and dashed red, connect different parts of the diagram, suggesting a complex system of relationships and feedback loops.



SOMA DESIGN INFLUENCES

When designing interactions with soma design, the designer draws from their own interaction- and sensory-experiences. It requires bodily understanding to explain how things feel. One of the bodily experiences explored during this design project was a so called “Slow Walk” through nature. It is meant to disrupt habitual movement patterns and enable the designer to feel how the body moves and reacts to different walking surfaces, the sounds of your body mixing with the sounds of the forest, what nature does to you and what you do to nature. We were asked to try and filter out the visual stimuli of the forest, as to experience the rest of the sensations stronger, but I chose to disrupt the visual stimuli in another way: By looking up at the treetops above. In one way this led me to disconnect to my body, but only visually as I did not see my body anymore.

At the same time I got this strong feeling of body movement, and how moving the body can control what you see. I felt in control of the visual parallax of the treetops, when I moved it felt as if they moved in response. This resonated with me as an experience where little input (only a few steps of movement, or just leaning your body away from its initial position) could create a big amount of visual stimuli, just as what the center wanted. The change in scenery is also one of stronger indications that your body is moving through space. In [4] Macnaghten and Urry explore embodiment in nature, specifically woodland nature. They interview and discuss how it feels to be in this type of nature with various participants. Something that seems to provide a strong sensory experience for their participants is movement in the woods, both moving through the woods as well as watching nature move on its own.

Change of visual stimuli in nature as influential is echoed in of how Ståhl et al. [6] explored the changing and dynamical nature of leaves and melting snow as influences for their design work. The influence that nature had on their work was in many ways visual. Vision is part of the bodily experience and even though it can be put aside to provide a method of estrangement that can bring about novel experiences, it should not be shunned.

In the previous part of this pictorial the topic of relative positioning as a mode of control was mentioned. This is since this slow walk was taken before the mapping of the design space with the critique-group. The realization of what had felt special about moving under the canopies and “making them move” did not become apparent until it was discussed during the mapping sessions.



Notice how much of a visual difference the same layers of tree-branches create just a few steps apart.

I wanted to translate this feeling of how bodily control over your own position in space could affect the visual experience above you. Initial ideas of how to do this related to the existence of themed rooms at the center. Specifically their nature room. But what made the experience interesting to me was not the specificity of the forest or nature, it was the relationship between movement and vision. It felt more important to create or enhance a feeling of movement and control. Therefore I started to explore what movement possibilities there was at the center and one that stood out was the Akkaplatta system.

There were two major reasons for this. The first one came about during my research when I came across an art piece called “Tango” created at the center by artist Felix Gmelin [1]. It is a modified track for the Akkaplatta user to drive along as if they are dancing the tango. This is an example of how already existing technology at the center can be repurposed to further enhance somatic experiences, in this case refining the movement experience into a dancing experience. The images of the art piece also drew my attention towards the patterns that the Slingan track creates on the floor. Because I was already primed about thinking of movement contextualized by my forest experience these tracks reminded me of walking paths in the forest.

The second reason came from looking at videos on YouTube of people driving the Akkaplatta in their homes and at various habilitation centers and schools. Many of them had visually stimulating, and sometimes other sensory-stimulating, contraptions hanging from the roof that you could drive under. Looking up at something interesting as you move, as I did in the forest, seems to be an experience that resonates with Akkaplatta users as well. Academic papers about the Akkaplatta are hard to come by but in one paper [5] by Modh she describes a survey about everyday use of the Akkaplatta and its meaningfulness to the users. In an interview with a companion to a user it is described that they noticed that the user would often stop at a seemingly uninteresting part of the track. But the companion

later noticed that at certain times and during certain days the roof at this part of the track would have spots of light that the user seemed to look for during the other days.

Akkaplattan stood out as both a versatile aid for movement, movement that can be open for recontextualization by influence of somatic experiences, as well as being an experience that is enhanced when visually interesting stimuli is placed along the path above the user.



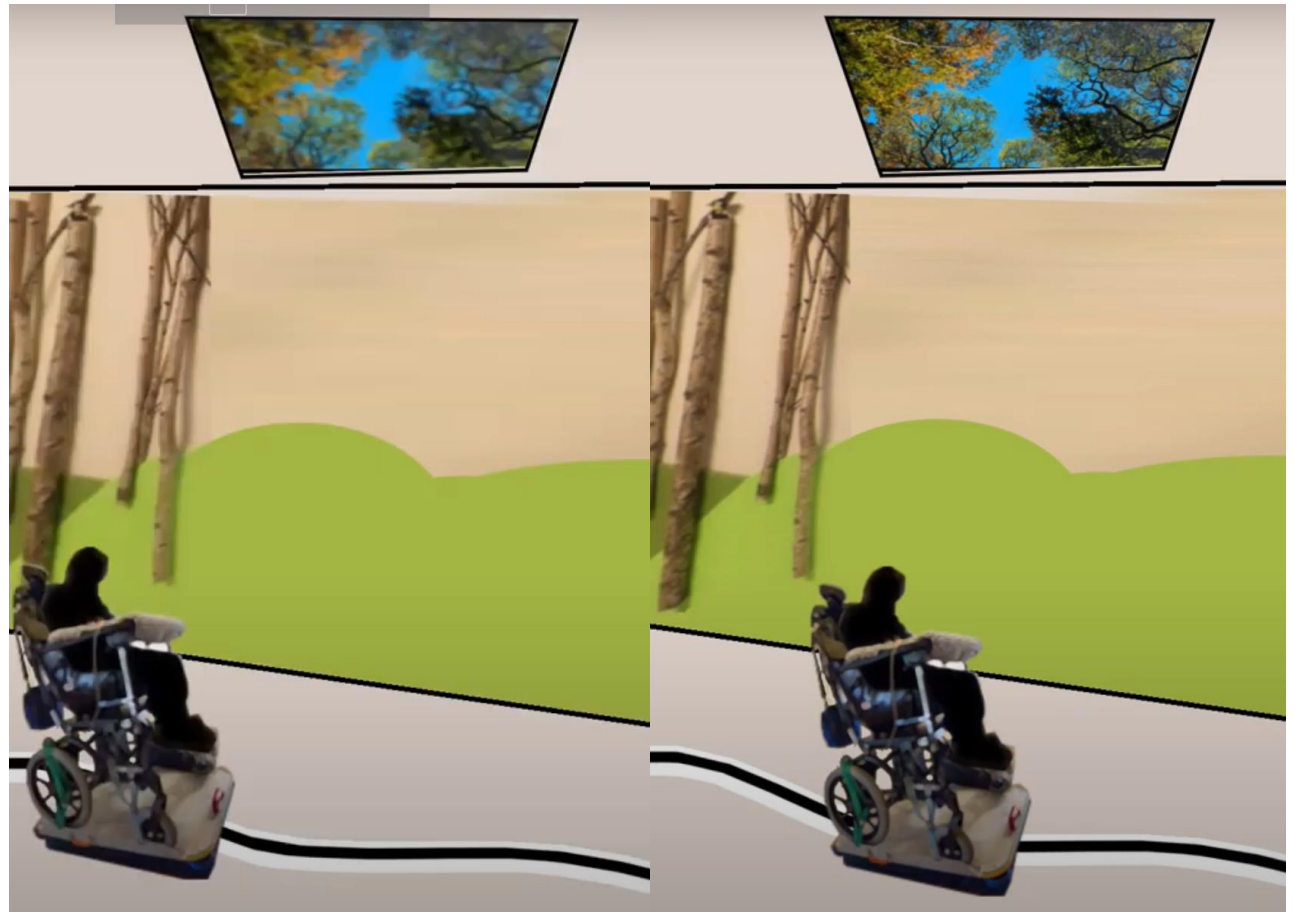
Photographs of Felix Gmelin's "Tango" courtesy of Po Hagström at <http://www.pohagstrom.org/page3/page15/page15.html>, beneath them is a stylised image of paths in the Grimsta nature reserve.

EXPERIENCE

To understand how this design adds to the Akkaplatta experience one must first understand how the basic Akkaplatta experience works. The Akkaplatta is a device which, when moving, follows a high-contrast track. It can be used with various chairs and wheelchairs that gets placed on top of it. It can be controlled by either the user or their companion. This design focuses more on the version that the user controls themselves. The controls consist of a button that either makes the Akkaplatta move forward along the track or stop. There are variations of which of these actions happen when the button is interacted with, some buttons enable movement when interacted with, and some enable stopping when interacted with. Interactions are touch based, such as pressing or touching the button.

During a presentation of a sketch of the design I received feedback about the importance of stopping the Akkaplatta. This is also something that is discussed and pointed to as important for users in Modh. The experience of control is not only the feeling of independent movement, it also entails the feeling of independent anti-movement. This expanded the scope of the design to also include stopping as an important cause that should have a strong effect. The experience could be split into two parts, movement and stopping.

The most important part of the feel of the movement experience was the sensation of parallax. The scenery is displayed on screens placed along the ceiling and the walls of the center. The scenery should move in relation to the user's movement and relative position to the screen, creating the sensation of parallax. It should feel as if the scenery is following the user's lead when you move, giving the user a sense of control over the scenery. The visuals can be created as 2d layers in a real time 3d environment, layered at different distances from the virtual camera. The virtual camera would follow along the user's movement, by triangulating the distance from screen to Akkaplatta in some way.



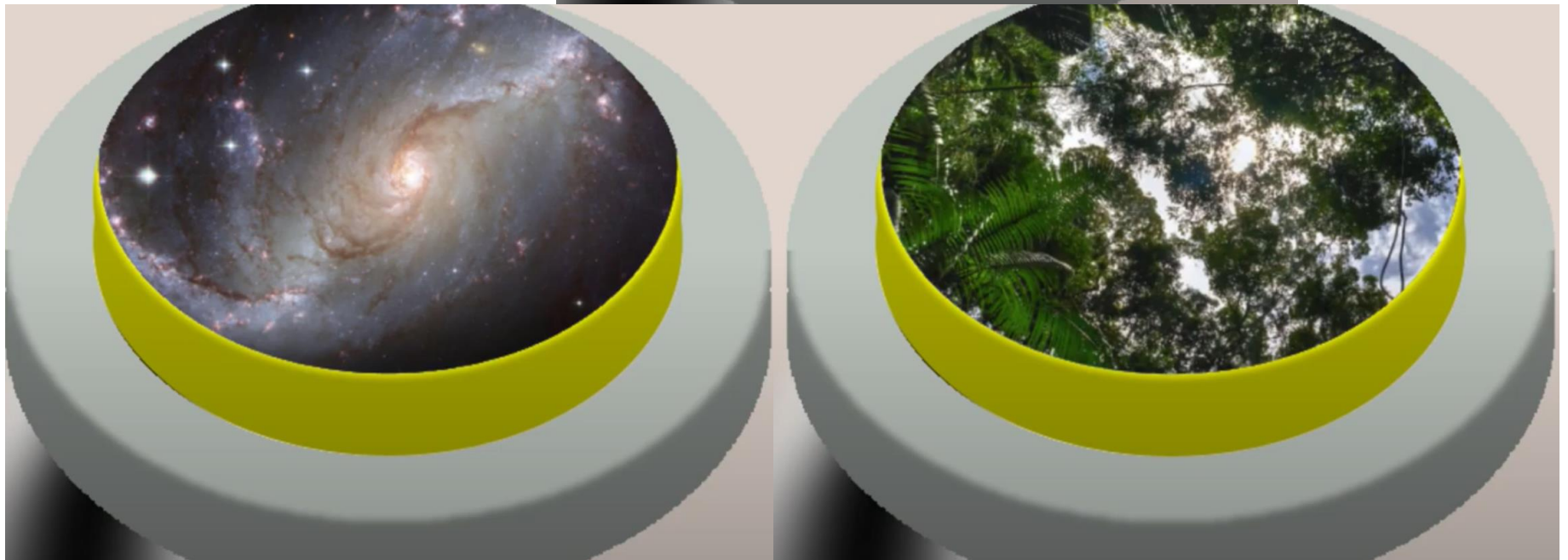
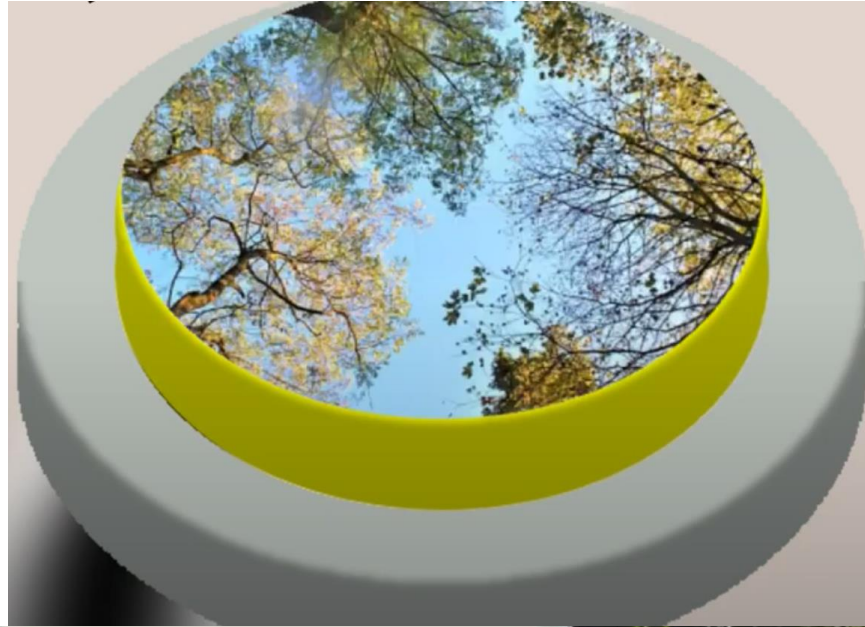
To contrast the movement experience of parallax, the stopping would have to be assigned further meaningfulness as well. Going back to the experience of walking in the forest, stopping while walking can give time to reflect about the sounds of the forest, as well as giving time to more closely examine the visuals of the surroundings. This serves as a base for what happens when you stop underneath or roughly underneath one of the scenery panels and adds a feature to the movement experience.

When the user chooses to stop (it does not do this automatically) underneath a scenery panel the view of the scenery should shift from being slightly blurred to coming into clear focus. This is the addition to the movement experience, that it is slightly blurred as to enhance the stopping experience. By inviting the user to stop, but not forcing them, beginner users might be prompted to try out stopping as a way of expressing themselves. The unblurring is supposed to evoke the feeling of examining the surroundings closer when standing still. At the same time as the view becomes clearer contextual audio starts to play from speakers placed in or near the screen. If the scenery is of a forest for example, there should be sounds of creaking trees and chirping birds, sounds that one would expect to find in such scenery in nature.

While developing the video presentation of what has been described of the design so far, I came across pleasant vibrating feelings from the audio reverberating through my desk when I browsed nature sounds. This prompted a last-minute addition to the design to include this pleasant feeling. The user is often in contact with the controller button of the Akkaplatta. By placing a small speaker in the button that plays the same sounds as the speakers above it, it creates both pleasant vibrations for the user to touch as well as bringing in a more immersive audio environment.



Something that is important throughout designing for the center is customizability of the experience. Some users will probably want to turn the entire thing off and only ride the Akkaplatta as usual which would of course be an option. But some might want to have the enhanced moving/stopping experience but might not enjoy the forest sounds and sights that were part of the influential experiences. This gave rise to the idea of the scenery and sounds of the design being interchangeable. Many different sceneries could be subject to interesting parallax movement and soundscapes. To implement this the controller buttons themselves would be interchangeable and represent different scenarios. There could be other types of forests, jungles or forests during different seasons. There could be one with a nautical theme, showing interesting clouds and playing sounds of seagulls and waves. There could even be a space button, showing constellations or galaxies with more base heavy sounds.



EVALUATING THE DESIGN

During this project there was unfortunately no possibility of getting direct user feedback to evaluate the design. To evaluate the design it will be looked at with regards to the qualities of somaesthetic appreciation design as defined by Höök et al. in [3]. They describe four key qualities as important: subtle guidance, making space, intimate correspondence and articulating experience.

Höök et al. [3] describe the challenge of subtle guidance as balancing between guiding the user's attention towards bodily or sensory sensations but not grabbing it. The Akkaplatta enhancement seeks to guide the user to appreciate the control they hold over their own positioning in space, their bodily movement. It gives subtle feedback when moving by moving the scenery according to your movement. The slight blur is supposed to raise curiosity that might invite the user to stop and look closer. There could be concerns raised about the sound-vibrating button as "too much", and it might hijack the experience when stopped, but it can be made as an optional part of the experience.

The Akkaplatta enhancement tries in some capacity to make space, in the literal sense as Höök et al. [3] puts it. When the user has stopped it is in specific spaces, and the soundscape provides somewhat of an atmosphere.

There is some semblance of intimate correspondence between the user's movement and the movement of the scenery, but this interaction is probably more aligned with what Höök et al. [3] describes as a separate entity and not an extension of the body. This might be as the visuals depicts separate entities that exist in the real world. More abstract visualizations that correspond to the positioning of the body in space might have served this purpose better.

The fourth quality, articulating experience, is present in the dichotomy between actively moving and actively being still. The experience seeks to contrast these two forms of movement. It is however, not

present through use of language and descriptions, as in Höök et al [3].

Höök et al. [3] expresses some concern about the effectiveness of modalities such as visualizations in the ceiling, as it pulls attention away from yourself and onto the visuals. But by giving the user an enhanced sensory scenario of exploring moving and stopping, and the affordances of these two states, when using the Akkaplatta the visualizations might serve as a necessary evil to help increase body awareness and control on their terms.

There has been some challenges in designing for the users who are patients at the center using these soma-based methods. One of the main aspects of these challenges is described in Höök et al. [2]. Designing with the soma puts a lot of focus on designing through lived experiences and the designer's own lived body, and Höök et al. provides some critique to this sort of first-person perspective as our own bodies are not the same as the body of another.

This blindness of how the other body experiences the interaction provides much difficulty in translating the felt experience [2]. The question of how to translate the experience of moving the body to someone where bodily movement and repositioning is usually not based on their own bodily compound actuation, but the actuation of a device or other bodies, is a hard question to answer. When designing with somaesthetics for people with disabilities, feedback from, and co-designing with them might have yielded more meaningful experiences or implementations.

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