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‘zones of flow (iv)’: horizontal immersion & interactions with water indoors

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Fig. 1. Two adults lying side-by-side inside ‘zones of flow (iv)’ during Open Studios, I-Park Foundation (Inc.), USA, May 2023.

‘zones of flow (iv)’ is an interactive immersive audiovisual installation designed to be experienced horizontally, while people are sandwiched between flows: a projection featuring water surfaces and reflections (above), a fully functioning waterbed (below), and stereo sounds (around). Visitors are invited to lie down on the waterbed and use their bodies and hand gestures to self-regulate the flows of moving images playing above them, and the surrounding sounds. The media presented in the installation brings snippets of the landscape indoors through field recordings and moving images featuring water and flows. With their bodies, people move the water that gently enwraps them underneath, and with their hands (through pressure and proximity sensing) they control and self-regulate their audiovisual experience (see <https://vimeo.com/844939019>, 2:54min video documentation).

CCS Concepts: • **Applied computing** → **Media arts**; • **Hardware** → *Tactile and hand-based interfaces*; Sensors and actuators; • **Human-centered computing** → *Interface design prototyping*; Gestural input.

Additional Key Words and Phrases: waterbed, horizontal interface, top-down projection, hand-based interaction, water-based immersive environment, stereophony, audiovisual experience, embodied interaction

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1 INTRODUCTION

Immersive and interactive installations are commonly presented as experiences where the body is positioned vertically: standing or sitting, shifting its vertical position as the individual moves. For practical reasons and to make these experiences accessible to larger groups, verticality (or sitting) makes sense, yet changes to this standardised approach of upright appreciation are rare. People find ways to sit or lie on the floor in large immersive setups (e.g. projection-mapping and full LED room experiences) but their ability to modify those experiences may be too subtle or non-existent.

2 RATIONALE

Initially inspired by a sailing trip, ‘zones of flow (iv)’ proposes a horizontal interactive experience that shifts people’s position away from the more standardised perpendicular one (see Fig. 1 & 2). While journeying across half of the Atlantic sleeping became a challenge and the experience of flows was heightened while trying to sleep inside a confined berth underneath the waterline, where the ceiling was close to the face and the water flows could only be heard around. The installation proposes an approach which, although perhaps, on one hand limits the number of people that can access the work at once (which is later discussed), on the other enables a more intimate and direct bodily experience.

Horizontality. Lying and sitting are associated with lower energy expenditure [1] and with relaxation settings, where the person can let go of their alertness. Inviting people to lie down or recline has been explored as part of artistic and research endeavours [2, 3, 8, 10, 13–15]. However, ‘zones of flow (iv)’ moves away from a solid surface (e.g. mattress or reclining chair) bringing the visual metaphor of fluids [11] into play through a body of water underneath the person.



Fig. 2. Adult lying down inside the ‘zones of flow (iv)’ installation during prototype testing at night, prior to the Open Studios.

Touch. Is perceived through the skin via – amongst others – direct contact with another body, whether inert or alive, and goes beyond hand-based touch. Haptic perception belongs to a complex perceptual system [6] that is interconnected with the other senses. In the case of 'zones of flow (iv)' the haptic system is engaged through the lying down of the body and its direct contact with the fluid waterbed, and the use of both hands to control the audiovisual experience.

Somaesthetics. To develop an artwork that is able to 'touch' another person, to affect their bodily experience, the body has to come into play from the start and become part of the design process [9, 12]. As Hook argues, things may not reveal themselves "to you until you experience" and embody them [7]. Experiencing through the body – of the artist and people – has been crucial in the development of 'zones of flow (iv)' from the early pilot to the more advanced setup.

3 TURNING BODILY EXPERIENCES INTO ARTWORKS FOR OTHERS TO FEEL WITH THEIR BODIES

The project has been developed using a practice-based research approach. Through this process of experimentation, testing and reflection – and using a somatic approach to find out what it is like to be inside the artwork – aspects such as sensory overload and the feeling of immersion have been noticed flowing through the body (or people have reported on this), which can only be revealed when you are *where the action is* [4], and you are immersed in the action.

3.1 Piloting horizontality

As a first step in attempting to convey the experience of trying to sleep while sailing – which originated the idea for the artwork –, an air mattress and an improvised horizontal screen using tripods and a stereo sound system was set up (see Fig. 3) to play a fixed-media piece that had been created already as part of the "zones of flow" series. The setup was tested with 10 people, who were invited to lie down and provide feedback on their experience. Along with on-site observations, what became clear was that not having control over the media was triggering for some people (over stimulation), and that multiple people may want to experience the artwork together by lying side-by-side. The first had not been initially considered because the intention was to transport the person to the discomfort of trying to sleep while sailing under rough meteorological conditions, and the second was a complete surprise that had not been predicted but that made perfect sense since attending exhibitions and interacting with artworks is often a social or group experience.



Fig. 3. Left: Adult lying on air mattress during the pilot; while testing horizontality and fixed-media audiovisuals in Studio 3, University of Kent. Right: Three adults lying together side-by-side, positioned across the air mattress. Both images relate to section 3.1.

3.2 Soma and interactivity in practice

In this phase, the setup involved a waterbed that cradled and supported the body's weight, giving an embodied feeling of suppleness and fluidity. Everything was sourced and developed as part of the artist residency at I-Park Foundation (Inc.), from the free-flow waterbed badder to the water, the back-lit projection screen and waterbed frame. The audiovisuals were recorded on site, while walking the land. The electronics were built using a force sensitive resistor (FSR) and Arduino, a LeapMotion controller was used, and the software was developed in TouchDesigner. As part of the process, countless hours were spent lying on the waterbed watching recorded footage (see Fig. 4, right) and playing field recordings through speakers in the studio, as well as testing the setup with fellow artist residents (see Fig. 4, left) ahead of the public view (see Fig. 5). During Open Studios, the public visited and took turns to experience the installation,



Fig. 4. Left: Adult lying inside 'zones of flow (iv)' hovering their hand above the LeapMotion controller to adjust the distortion of the image above and the speed of the audio. Right: Detail of moving image playing while being tested on the horizontal projection screen.



Fig. 5. Presentation of the prototype for 'zones of flow (iv)' during Open Studios at I-Park Foundation (Inc.), Connecticut, USA. The general public visits the installation: one person is lying on the bed horizontally while other people stand around. May 2023.

sometimes in pairs, and even toddlers and children laid down on and interacted with it. Unfortunately, given the number of visitors (see Fig. 5), many had to experience it while standing. The development and testing was documented (i.e. video, photo, audio) which along with on-site observations will feed into any future development of the work.

4 FUTURE WORK AND CONCLUSION

An aspect that deserves further attention is the interaction mode. Currently, people control different aspects of the audiovisuals (i.e. speed of sound, switching between scenes, revealing visual layers, affecting contrast), and although the full body is present floating on the waterbed (or air mattress if the venue prohibits water), its interaction with the digital content is via the hands. The use of the FSR and LeapMotion controllers was a step forward from the pilot (see section 3.1) but using a full-body sensor would be the next logical step, and potential technical solutions are currently being investigated. For this upcoming development phase, it is required to either acquire an off-the-shelf full-body pressure sensor which is normally designed for medical or commercial research settings (e.g. Tactilus®) or to build a custom-made one in house, using pressure (e.g. Velostat®) or capacitance techniques [5] so that position data along with pressure intensity and changes over time can be fed back into the installation. With this further development, the full-body sensor would become the interface for seamlessly exchanging flows between people and the artwork.

As described in section 3, 'zones of flow (iv)' is in flux. As with any practice-based research, its current state is a mere pause for reflection. The artwork in itself is never finished, but in flow as people engage with it when installed.

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