ROOM#81 – An Architectural Instrument for Exploring Human Control of Primitive Vocal Cues

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Abstract

ROOM#81 is a digital art installation which explores how visitors can interact with architectural and vocal cues to intimately collaborate. The main space is split into two distinct areas separated by a soft wall, i.e. a large piece of fabric tensed vertically. Movement within these spaces and interaction with the soft wall is captured by various kinds of sensors. People's activity is constantly used by an agent in order to predict their actions. Machine learning is then achieved by such agent to incrementally modify the nature of light in the room and some laryngeal aspects of synthesized vocal spasms. The combination of people closely collaborating together, light changes and vocal responses creates an intimate experience of touch, space and sound.

1   Concepts and Outline

In ROOM#81 we examine interactive places that explore interaction through subtle contexts (Bruges, 2010). Visitors are welcomed in a room where architectural and vocal cues are the main components that structure the nature of such space. A large piece of fabric is hung up in the middle of the room to create a soft wall separating the space in two areas. Visitors, who have never seen each other before, can access the installation from both sides of the fabric and have an interaction between themselves by pulling and pushing the fabric. Their movements in space, along with their haptic interaction with the fabric affect the sentient nature of the room, which responds with changes in light and voice modulations. Visitors experience an invisible, yet personal, vocal character that screams in agony, pleasure, or concern some- where in the room they intimately share.
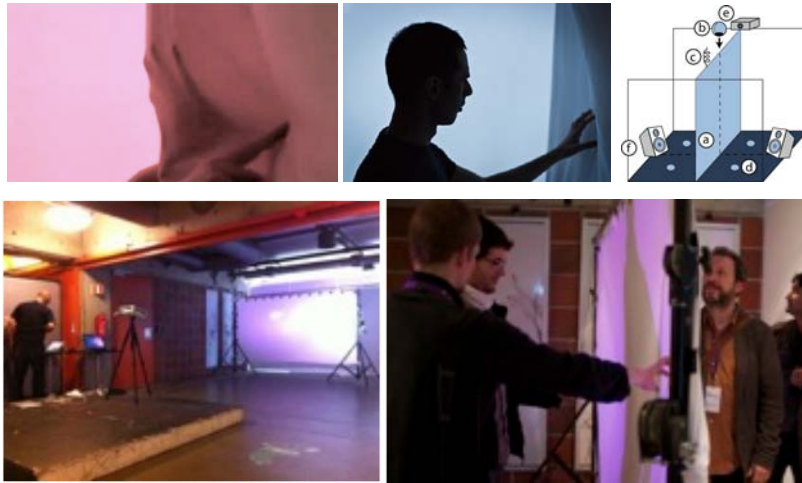
2   The Soft Wall: A Mediation Tool for Intimacy

We believe that these three simple cues – the movement of a foreign person towards you through a piece of fabric, the changes in light quality and the changes in the tension of a voice – open up a large space for aesthetic interpretation. Based on intimate and sensual displacements of the fabric, one begins to wonder the nature of the person behind it. How does this person look like? What is his/her personality? These questions make the soft wall both an invitation to play and a collaborative effort to affect the room's nature.

3   The Vocal Character: A Subjective Response

The large spectrum of vocal solicitations adds a second layer to our exploration. We can easily imagine some visitors being amazed by the sharp and quick spams of the voice synthesizer. Yet, we also think some of the visitor who might regard such sounds as painful screams, or clear sexual references. The same is true for slow and languorous sounds or whispering noises. Because people react differently to the same kinds of vocal stimuli, our array of stimuli becomes infinitely large. ROOM#81 positions itself at the subjective level of human interaction, opening a wide space for interpretation.

4   The Agent: Analogue Instrument and Social Control

With this collaborative instrument we also offer a greater social sense of control. Visitor's interaction is never directly mapped onto the vocal or light spaces, but has a non-obvious, adaptive impact on the vocal and light stimuli. Gestural inputs from sensors are used in an

ongoing machine learning process that constantly changes the behaviour of an agent. As the agent forms a model of its world and acts upon it, its "thoughts" are mapped on the vocal and light spaces. With this in mind, a visitor can only control the other person's reaction to his own usage of the fabric. As such, we conceive ROOM#81 as an analogue instrument of a tripartite nature, that is, played by two humans that discover each other through a soft wall and an architectural/vocal agent.

5   Lessons Learned From NIME 2011

ROOM#81 formed part of the NIME 2011 conference in Oslo, Norway (d'Alessandro et al., 2011), and was installed in Chateau Neuf, a cultural place for students, for three nights. The soft wall was placed in a corner, next to a busy staircase that conference visitors would use to go between concert venues, the bar, and the exit doors. During the first night we introduced the concept to passer-by people, inviting them to explore the installation. The second and third nights, we observed quietly without interfering with the natural way people would interact with ROOM#81. We present the lessons learned during NIME 2011:

5.1   The Voice Is Real

None of the participants questioned the fact that the voice sounds being streamed out of the loudspeakers were coming from anything else than a real human. This might have been due to the fact that NIME participants are used to experience interactive artwork with a sound dimension. However, visitors commented that "[the installation] uses pre-recorded real human screams that are somehow shuffled and remixed". Nevertheless, the voice used in ROOM#81 was purely synthetic. This pointed to the fact that our sound mapping, although simple, led to a highly natural and expressive human sound. Particularly, the hysteresis-based relation between vocal effort and pitch might be the property of voice synthesis that needs to be investigated further in order to better characterize this phenomenon.

5.2   A Square of White Fabric Plus a Projector Is a Public Display

The current shape of the interactive wall – a white fabric hanged on a frame with a projector pointing on it – is really likely to be perceived as a screen. Some participants were expecting ROOM#81 to be a passive projection of "imagery" that would appear once they interacted with the artwork. Viewers would contemplate the artwork waiting for the moment such projection would start. From the architectural point of view, we found that vertical framed surfaces are conceived as public displays, rather than partitioning walls. A more in-depth analysis of the affordances of interactive architectural elements is needed in order to create installations that are perceived as architectural elements.

From our observations at NIME 2011, we can argue that it is the form, material and content being projected what shapes how an installation is perceived, i.e. as an architectural element, as a public display, or as a touch inviting membrane.

5.3   Cognitive Impact of Realistic Vocal Stimuli Is Overwhelming

A significant number of visitors would perceive our voice synthesis as being real human sounds. For these people, touching the fabric was evident and their reactions quite strong. By touching the fabric they would alter "unexpected" aspects of these sounds at the macroscopic (through the agent training) and microscopic (through the direct connection of one bend sensor) levels. However, because the voice mapping was performed by a statistical agent, the voice remained consistent and natural over the whole interacting experience. As a result people felt the "awkward" feeling of affecting a real human when touching the wall. Some visitors were amused by the voice and would attempt a touch-based dialogue with the system. Others were overwhelmed by the screams, and one person even started screaming. We can state that our approach to interaction, as being not directly mapped to visitor actions, but controlled by a decision algorithm might encourage more empathic behaviours from visitors.

5.4   Anonymity and Co-interaction Makes the Experience More Engaging

We noticed a strong level in visitor's engagement when interaction with ROOM#81 was experienced between two people touching the fabric on both sides. Because people could not see each other, and interaction was subtle, people could negotiate before entering the installation to "interact together". It was this mediation and collaboration to attempt to control the voice through sensual touching what we found as being the most engaging part of our installation.

6   Conclusion

ROOM#81 is a voice synthesis and architectural cues installation that leveraged the nature of sound and space perception to explore an intimate approach to public interaction. Through careful selection of voice synthesis, materials and space we explored the nature of collaborative interaction in public spaces. ROOM#81 formed part of NIME 2011 and our observations point to the fact that it was the subtle and unpredictable nature of the interactive mapping, and the human nature of the voice what served to attract passer-by people to interact. It was the subtle interaction "through" a physical medium – the soft wall – and the sensual nature of the voice what led to a successful intimate experience for these participants.

References

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