Sound-based Thinking and Design Practices with Embodied Extensions

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ABSTRACT

The discourse surrounding intangible materials in interaction design is often directed toward computational materials [2, 9], however, this studio focuses on sonic and electromagnetic fields as intangible materials with distinctive qualities and methods of interaction. Participants explore the notion of extended body by augmenting their natural hearing abilities through body-space-object interactions. Using analog and radio-frequency (RF) sonic extenders, participants direct, block, amplify, and filter sounds, and perceive the surrounding electromagnetic landscape, thereby creating a “super sense” of heightened audition. This sonic experience explores the sensorial possibilities of the future body, where aural augmentation could take place. Using soundwalking and soundmapping as methods, participants explore transitive sonic forms that change their qualities and content over time in downtown Sydney. Participants produce a collective soundmap identifying embodied sonic extensions and acousmatic techniques, along with movements, gestures, and choreographies. This data will be used to stimulate a final discussion.
**KEYWORDS**
Embodied sonic extensions; soundwalk; soundmap; body augmentation; intangibles

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**SCHEDULE**
1. Introduction: Materials and Methods
2. Soundwalk 1: Ambient Space Exploration
   *Lunch Break*
3. Soundwalk 2: Urban Space Exploration
4. Group Soundmap; Reflection; Discussion

**DETAILED PROPOSAL DESCRIPTION**

**Sonic Extenders**
Sonic body extenders are experiential knowledge generators for sound-based thinking practices and interaction design. Although the human body has natural limits to audition, it is possible to extend these limits through aural and perceptual augmentation. The sonic extenders allow one to experience the changes in-depth perception, e.g. when the listening position is shifted or the listening device is modified. The designed objects (sonic extenders) suggest ways of directing, blocking, amplifying, and filtering sounds in our environments, as well as perceiving sounds normally unavailable to us, such as electromagnetism. The sonic extenders are grouped into (a) analog and (b) radio-frequency (RF) and have been selected and designed with particular qualities showed in Fig. 5.

**Analog Objects**
Sounds appear not as fixed, but as a flux, therefore the study of sound begins with fundamental experience—listening. Listening is a way of thinking which concentrates an intense examination on lived-body experience in its multifaceted, complex, and essential forms [10]. Embodied and situated listening is investigated within different analog objects. The experimental analog objects work as acoustically-oriented body extenders as presented in Fig. 1 and Fig. 2. These listening objects intensify the experience: dampen some sounds and emphasize others, sounds are magnified, filtered, directed, blocked, etc. Co-listening practices investigate the concepts of ‘shared sensibility’ [4] and ‘being-plural’ [6] and are used as the method for experiencing sound together with another person(s). Sonic experience is intensified by acousmatic listening, e.g. blindfolding. The sonic extenders are design facilitators and idea generators, that reflect the embodied knowledge in the act of listening. This artistic practice is aiming to develop an alternative language, variables, and methods for thinking, interacting, and designing with a sonic matter.
RF Objects
Radio-frequency (RF) sonic extenders are performative designed objects that operate as functional textile antennas as presented in Fig. 3 and Fig. 4. They receive electromagnetic frequencies in the range of 50Mhz to 5Ghz, spanning the range of WiFi, Bluetooth, GSM and GPS, and other wireless data transmissions [5]. Through the use of custom electronic circuitry, the electromagnetic waves are converted to audible soundwaves. The textile, formal, and interaction qualities of the RF sonic extenders influence the frequency reception [7], resulting in varied sonic expressions. Further, the wearer displaces their sense of audition by listening through RF sonic extenders that are placed in different locations on or around the body. This allows one to perceive electromagnetic waves at different heights and directions in relation with the body, giving rise to a body-object-space interaction. The RF sonic extenders also assist in describing the electromagnetic space that one occupies. As sound artist, Christina Kubisch notes: “you can only hear them [EMF] in certain areas. And sometimes, if you move 10 cm to one side or the other, they disappear. I think of them as electrical corridors.” [1]

Soundmapping
The theoretical framework upon which soundmaps are based derives from earlier research on acoustic ecology and soundscapes, the latter being a term first coined by Canadian researcher and music composer R. Murray Schafer in 1960 [8]. Soundscapes of Sydney will be documented within the visual-audio platforms (Google Maps and Soundcloud) by uploading recorded binaural sounds and visuals of sonic extender used for listening in the specific place. The soundmap is then represented as a graphic score with the participants’ annotations spatially distributed as the experienced place is recalled, and using different marking to signify for example biophony, geophony, and anthrophony [3]. This data uploaded into a digital map will be the end product available for public collaboration and representation as seen in Fig. 6.

TOPICS TO BE COVERED
- Sonic and electromagnetic aesthetics;
- Methods for perceiving and interacting with intangible materials;
- Body extensions and body augmentation through designed objects;
- Collective sound mapping as a method of presenting research data.
DISCUSSION OBJECTIVES

- Reflection on sonic and electromagnetic aesthetics;
- Critical perspectives on sound walking and soundmapping as methods;
- Reflection on lived-body practice towards new methods for designing with intangible materials;
- Critical feedback on the designed objects in use;
- Discussion on future body audition attained through sensorial body augmentation.

SUPPORTING DOCUMENTS

- Documentation of previous related international project Beyond Seeing (the investigation of extended hearing sense and acousmatic listening): [https://www.goethe.de/ins/fr/prj/prj/bes/en/bor.html](https://www.goethe.de/ins/fr/prj/prj/bes/en/bor.html)
- Documentation of the previous related project at the ArcInTex conference (the study of listening modes with analog and digital sound amplifiers): [https://arcintexetn.com/2016/05/30/listening-modes](https://arcintexetn.com/2016/05/30/listening-modes)

REFERENCES


