‘Unheard’ Sounds

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1. INTRODUCTION

Sound propagates through space as a series of vibrations; the physical attributes of this motion excite and engage listeners on another level. For example, when standing close to a loudspeaker, you can feel the propagation of waveforms through the speaker cone; this is particularly prominent at low frequencies. Instrumentalists feel parallel, physical sensations as their instrument produces sound. Additional haptic and vibrotactile stimulation can provide a further sensory modality, or channel of communication through which musical information can be enhanced.

This installation forms a part of the larger body of research - exploring the relationship between the haptic and auditory sensory mediums in the context of music composition. Throughout this work, the haptic communication channel is considered as an *instrument* and/or as a purely expressive medium. This will be the premier of a recent composition-installation, *‘unheard’ sounds*. *‘Unheard’ sounds*, explores the relationship between the auditory and somatic sensory systems by highlighting aspects of sound, such as masked noises and other interplay that appear less apparent in an audio mix.

2. BACKGROUND

Of interest to this project are the physical aspects of sound, particularly the physical sensation and somatic stimulation of sound imparted on listeners. The somatic nature of live musical experiences is inherent in the physicality of sound waves produced by instruments and loudspeakers. When considering the relationship between sound and touch, Glennie (1993) states: “*Hearing is basically a specialised form of touch.*” Whilst the *tactility* of the ear facilitates the listener’s perception of an ensemble’s sound, the physical sensations of these waveforms are imparted on both the body as a whole, and objects in the performance environment.

Whether the multimedia nature of performance detracts or distracts from musical experience or not

is debatable, however, the author pertains to a Deleuzian listening that suggests “*art should lead the subject to an experience of multi-sensoriality*” (Bidima 2004). For many composers, the advent of audio-visual technologies (real-time and fixed) has augmented their practice, allowing a greater control of multi-sensory listening experiences. No longer are composers limited to defining the auditory parameters of musical works.

Several artists have explored haptic installation art, in combination with audio stimuli. Heather Dewey-Hagborg’s (2011) work *Buried Sound 2: Haptic Resonance*, uses sound to produce vibration, exploring it in its physical form, as an instrument of the somatic. The work employs an analogous audio-haptic relationship where a speaker is placed directly under the floorboards of a gallery space. Inspired by the deaf experience of sound as ‘pure-vibration’, the work seeks to transform sonic material by augmenting its inherent tactility on the body. Similarly, Salick (2009) uses vibrations to invite participants to *Feel a Bit Like Beethoven*, using a wooden sculpture integrated with speakers. ‘Feelers’ place their hands over the installation, which allows them to explore the tactility of Beethoven’s oeuvre, akin to the composer’s deteriorated hearing.

Hayes’ (2012), *Skin Music* utilises a haptic-augmented chaise longue to vibrate the body, enhancing sounds natural, yet unconscious affect of the body. Sound is transmitted through motors in the chair to the body via its wooden struts. The work seeks to allow people with sensory impairments to experience sound in alternative ways. Motors are placed on the arms of the chair for the ‘feeler’ to hold on to, and also at the back of the head and the lower back. This work employs a synchronous musical accompaniment.

Organ Organ, a work by Eric Gunther (2007) is another example of music for the body, employing a mouldable 12-channel vibrotactile surface that produces low-frequency vibrations together with a 2-minute electronic music composition. The artist briefly describes his process; “*Spatial ideas led to*

musical phrases while rhythms and melodies motivated phrases of choreography on the space of the body."

These works present an interesting and diverse range of practice, and although lacking in written documentation, they clearly present as focussed explorations of the body as a sound-absorbing, vibration-reactive artefact. This idea runs through notions of the audio-haptic relationship, with a consideration of the listener/feeler's body as the instrument or vessel.

A difficulty with haptic-based art practice is that it requires a certain immediacy and bodily presence within a particular space. Installations such as these require bespoke hardware/software, often at considerable expense, and with limited instruction, difficult to replicate. A challenge for haptics hardware designers is producing cost efficient, reproducible and modular interfaces for these purposes.

3. 'UNHEARD' SOUNDS INSTALLATION

The installation of this work consists of speakers performing the auditory part and a haptic interface, attached to a chair, rendering the somatic element, producing vibrations alongside musical accompaniment. Visitors experience a new dimension of musical expressivity, feeling parallel sensations of sound on their body. A brief overview of the design of this system is given in this paper; further information and related research that inspired this installation can be found in Armitage & Ng (2015).

A haptic interface has been designed, consisting of 16 large ERM motors that are aligned in a grid array. By switching between motors different tactile effects can be imparted on the body, exploiting illusions of the sense of touch. This has been

integrated into a portable seat cover that can be positioned on the back of chairs.

For the installation, 'Unheard' sounds; an electronic work has been constructed using ideas of masking or covered sounds (see Figure 1). It considers the occlusion of sound brought about by stochastic processes in music, and how a tactile, or haptic feeling could subvert this. Haptics, synchronised to audio follow the time and duration of a subtle, rhythmic melodic line. Drones of variable, swelling loudness engulf these delicate sounds. The question for the listener is: can you still hear these sounds through your body?

4. REFERENCES

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