

SOUND LABYRINTH: EXPLORATION OF THE EMBODIED SUBLIME THROUGH AN IMMERSIVE AUDIO/VISUAL INSTALLATION

ABSTRACT

As immersive audio/visual technology continues to mature and become commercialised, the creation of sophisticated interactive systems that previously required significant infrastructure and funding comes within reach of the solo artist. With the ready availability of motion tracking systems like the Microsoft Kinect, and the proliferation of software components for creating immersive media environments, the challenge of audio/visual installation work is more than ever focused on addressing deeper conceptual issues, rather than solving technical issues.

Through the use of both representational and abstract audio, immersive sound spatialisation, multi-channel video, and the incorporation of gesture-based interaction abstraction, *Sound Labyrinth* applies theories of gesture within electro-acoustic composition, and theories of movement analysis and embodied music cognition, to the examination of the boundaries between virtuality and embodiment, transcendence and immanence, as an exploration of the “sublime within the everyday”.

1. INTRODUCTION

Immersion and interaction are two key objectives propelling digital art. This requires bigger screens, head mounted displays, multi-screen projections, 3D visualisation systems, and ever more realistic rendering systems, and multi-channel surround sound that places the listener in the scene. Likewise the quest for interactive media has matured from keyboard-driven text adventures, to body sensing motion capture systems, including high fidelity systems such as Vicon-8 [10], through to commercial gesture tracking systems like the Microsoft Kinect.

While a thorough examination of the use of gestural interfaces within immersive installation practice is beyond the scope of this paper, it is worthwhile briefly touching on key developments and concepts. *Sound Labyrinth* draws upon the concepts and techniques of the now common immersive CAVE system [8], although with greater emphasis on immersive sound than fully immersive visuals, as described in Section 3. Such immersive environments are often experienced as trancelike, meditative, or mentally absorbing [11, p. 199], and as such, are more suited to the goals of *Sound Labyrinth* than a more open gallery architecture.

The other key development utilised by *Sound Labyrinth* is the natural body interface. By removing the need for

any form of physical control apparatus, the distance between the participant and the virtual world of the art work is reduced, heightening both the immersive quality of the work, and the sense of the participant’s embodiment within the work [*ibid*]. As a work exploring the interface between the embodied and the virtual, this distance-reducing, boundary blurring technology is of great conceptual importance.

Rapid increases in available computing power, and the ubiquity and variety of user interface systems has reduced the cost of developing immersive environments. This ready availability, which brings its own challenges, does allow work in this medium to explore conceptual issues, rather than focus on overcoming technical issues.

In the following sections, I first explore the conceptual and aesthetic issues which *Sound Labyrinth* seeks to address, before turning to a description of the work itself, the specific design strategies employed, and finally reflections upon the end result.

2. SUBLIME SOUND: EXPLORING THE SPECTRUM OF REPRESENTATIONAL AND ABSTRACT AUDIO

2.1. The sublime in (sound) art

This work arises from my desire to use sound as an artistic medium for exploring the sacred, not in an overtly religious sense, but in the sense of the (transcendent) sublime: “that which is beyond the senses”. Although having roots in antiquity, the concept of the sublime as an aesthetic polarity in contrast to beauty was first expounded by Edmund Burke[5]. Kant takes up this theme in *A Critique of Judgement*[12], noting that beauty “is connected with the form of the object”, having “boundaries”, while the sublime “is to be found in a formless object”, typified by “boundlessness”.

Schopenhauer[19] further developed Kant’s concepts of beauty and the sublime, in which the sublime lies beyond the subject’s ability to either physically cope with or mentally perceive or even imagine. In grappling with this inability, the subject comes to apprehend the concept of incomprehensibility, and in this way become consciously detached from their own will¹.

What then is the relationship between the sacred and the sublime? Sacred, in its literal meaning, designates

¹In more contemporary, and more humorous terms, this concept of the sublime emerges in the writing of Douglas Adams as the Infinite Perspective Vortex

something set apart from common use, typically in association with a deity [17]. However the broader implication of the term is that it designates objects, places or actions which stand in relation to something beyond direct expression - the sublime. If, after Shopenhauer, we consider the spectrum of aesthetic experience ranging from the sensate to the sublime, where the experience of sensate beauty relies upon perfecting representation, in contrast to the sublime, which is beyond representation, then sacred music or sacred sound is that which is not necessarily beautiful (not focused on the perfection of form), nor that which perfectly represents some externality, nor even that which perfectly represents itself, but that which engages the listener with the paradox of perceiving the unperceivable, the unrepresentable, and in that way offers detachment from self. Sacred sound, rather than being the concrete signifier of particular beliefs, is the liminal, aural space of Cobussen [6], within which there is the *potential* to experience the sublime.

From another perspective, the objective of seeking to engage the sacred through sound, specifically in the context of digital sound making, is a response to Walter Benjamin's critique of all art making conducted under the condition of mechanical reproduction [4]. Benjamin speaks of the transition from art being purely valued for its ritual function, often tied to a specific (religious) location, to being valued for its economic function as a globalised, reproducible commodity. In a time when the reproducibility of music has reduced even its economic value, reconnecting sound to a specific, it is therefore interesting to approach sound making from the perspective of a site-specific ritual: the installation.

Benjamin speaks of mechanical reproduction stripping an artwork of its uniqueness, diluting its "aura". This aura is observable in the reverence accorded to objects (or for that matter, compositions) dedicated to some transcendent Other, and to a similar extent, to secular art works that are valued for their uniqueness: not merely by virtue of being handcrafted, but by virtue of being truly original *instances* within the *generality* of their form. If virtuality, or arguably, transcendence, is a generalisation of the specific (i.e. the generative ground from which the specific arises), then in contemporary terms, Massumi [16, p. 82] suggests that it is the inclusion of "transcendence become immanent" in an work which lends uniqueness and interest to it. Perhaps, in Benjamin's terms, what is added is not just interest, but "aura".

How then is sound a medium through which to explore the sublime Other? To what extent can sound be used to explore the generative ground, the virtual space, of the sublime, that Massumi alludes to?

That sound art is an ideal medium for exploring the theme of meaning which emerges from apparent chaos, or continual flux, is taken up by Cox [7]. Cox examines Leibniz' concept of noise as symptom of the limit of our perceptual capacity. Leibniz argues, for example, the *noise* of the ocean is a consequence of our inability to consciously process all of the perceptual input we re-

ceive from each individual wave. If our perceptual capacity were greater, then the apparent chaos would be seen as order. Cox takes Leibniz' concept further, suggesting noise is "the ground, the condition of possibility for every significant sound, as that from which all speech, music and signal emerges and to which it returns", thus identifying noise with the generative virtual, the sublime in the sense of the *sub-limine*, "beneath the threshold".

Noise, in the more common sense of unwanted signal, also poses an opportunity for engagement with the Other, in as much as the unwanted signal calls for an openness, a reorientation of desire, a relinquishment of control, a reception, an entering into relationship with its source [13]. The next door neighbour's party, and the prophet's revelatory condemnation of societal injustice: both impinge upon a subjective contentment with the silence surrounding the status quo and offer an opportunity to engage - join the party, repent.

Sound art, as a field of expression that actively engages with the virtual (the abstracted, potentialised gesture), and disrupts silence without necessarily offering a concrete representation of the Other, is a medium like no other in which to explore the transcendent sublime.

It is from this understanding of the aesthetics of the sublime that I approach the issue of sacred sound design: a practice of sound design that acknowledges a transcendent sublime but rather than attempting to either directly represent it, or express it through absence, engages in a continual questioning of the present moment, prompting awareness of the formlessness beyond perception, which is the ground of being.

2.2. Gesture and embodiment

Given the objective of exploring the sublime through sound art, to what extent can sound design transcend cultural context? The dialectic of essence and existence, virtual and actual, potential and event, becoming and being, finds its nexus in the embodied consciousness. Not the mind-body dualism of Descartes, but much more so the body-mind continuum of Marc Leman.

For Leman, knowledge emerges out of need to *act* in the environment, not just collect information for its own sake, and hence the focus of the embodied cognition approach is on action. Key to the embodied perspective is evidence for a close coupling between the cognitive processes for movement and perception. Leman [14, 77-102] provides extensive discussion of the evidence, including the behavioural observation of infants' innate ability to perceive gestures and replicate them, and the neurobiological observation that some of the same neurons which are fired to create a gesture (e.g. grasping-with-the-hand) also fire when the subject observes another performing the same action. These are the so called mirror neurons.

The tight coupling of movement and perception at a cognitive level gives rise to the idea that just as our movements arise from intentions (simulation of the movement), so perceptions of the external world map back to inten-

tions because of the trace left by the shared cognitive processes. This action-oriented ontology suggests that even at the social level, the actions of others are understood in terms our own intentions, i.e. our own simulated actions. The “moving sonic forms” of music are likewise attributed with intentionality because of the coupling of perception and movement. Thus, because individuals develop their own action-oriented ontology in a similar way by virtue of a common physiology, if not common culture, semantic communication is possible through music [14, 92].

This perspective is significant in the context of the discussion so far, for it provides both empirical evidence for and an explanatory theory which allows for a basic level of “objective” meaning to inhere in sound due to our common cognitive strategies, while still allowing for individual and cultural differences. In this sense, an embodied cognition approach to music meaning provides some resolution of the debate between formalists/structuralists and phenomenologists/post-structuralists.

Smalley links spectromorphological forms of sound art to the morphology of human movement [21], an insight which is backed by work of Leman. From a compositional perspective, Smalley identifies several levels of gestural *surrogacy* - degrees of abstraction away from both the source material the gestural archetype.

- primal gesture: basic proprioceptive gestural awareness, not linked to music making
- first order: recognisable sonic material subject to recognisable gestural *play* without *instrumentalisation*
- second order: traditional instrumental musical performance
- third order: where a gesture is inferred or imagined in the music, but both the source material and the specific gesture are uncertain.
- remote: where “source and cause become unknown and unknowable as any human action behind the sound disappears”, but ... “some vestiges of gesture might still remain”, revealed by “those characteristics of effort and resistance perceived in the trajectory of gesture”.

In this regard, my approach to exploring the sublime through sound plays with both the spectrum of sonic material, from the representational to the abstract, and the spectrum of gesture, from the primal to the remote. In this way the spectrum of immanence-transcendence is likewise explored.

In the next section, I examine the *Sound Labyrinth*, an immersive installation in which the dimensions of sublime sound are explored.

3. SOUND LABYRINTH

Sound Labyrinth is focused on the relationship between sound and the body and the sense of meaning or “sacred-

ness” that emerges from that relationship. The centrepiece of the project is an installation which uses ambisonic sound and immersive video projection set within large geodesic dome. As an installation, participants are able to explore a number of different sound worlds located within the space of the dome. These sound worlds comprise field recordings and sound designs by the author and material contributed by three poets: Nazid Kimmie (Australia/South Africa), Melike Ülgezer (Australia/Turkey) and Rebecca Lemaire (India/Belgium).

The audio elements focus on sounds which relate, in broad terms, to the concepts of the sacred and the sublime, as well spoken word material relating to these themes. In addition to these specifically constructed sound worlds, the dome space also incorporates contributions from the public, submitted via the project’s web site or collected during sound walks conducted in conjunction with the installation.

The interactive mechanism of the installation allows participants to explore this sonic material as they move around within the dome, with the quality of the sound responding to their posture and gestures. Video projection within the dome provides additional context for the sound/gesture experience.

3.1. Audio/visual Infrastructure

The physical structure of the installation comprises a 6.5m diameter, three frequency geodesic dome frame with a translucent white material cover. Within this frame, a 24.2 channel sound system is installed, along with 4 channel video projection.

The 24.2 channel system consists of 24 matched mid-range Grover Notting CR-1 reference monitors [1] and 2 powered subwoofers. The 24 mid-range speakers are laid out in three levels: 12 speakers in the bottom layer evenly distributed around the circumference of the dome (approx 1m from the ground), 10 speakers in the mid layer, approx 2.5m from the ground, and 2 speakers directly overhead approximately 0.5m either side of the centre of the top of the dome. The crossover between the mid-range and subwoofers is at 100Hz, making the low frequency speakers slightly localisable. Hence two subwoofers are used, and are distributed on either side of the dome so as to not disrupt the overall sound image. The signal structure for the system is shown in Figure 1. Figures 2 and 3 show the layout of components in plan and elevation views respectively.

Spatialisation of the audio content is controlled via Max/MSP, using the ICST ambisonic externals [18]. Fourth order Furse-Malham encoding was found to give the best result in terms of sound image.

3.2. Audio content and spatialisation

The starting point for the audio content of the *Sound Labyrinth* lies in field recordings presented in a representational style, recognisably source-bonded.

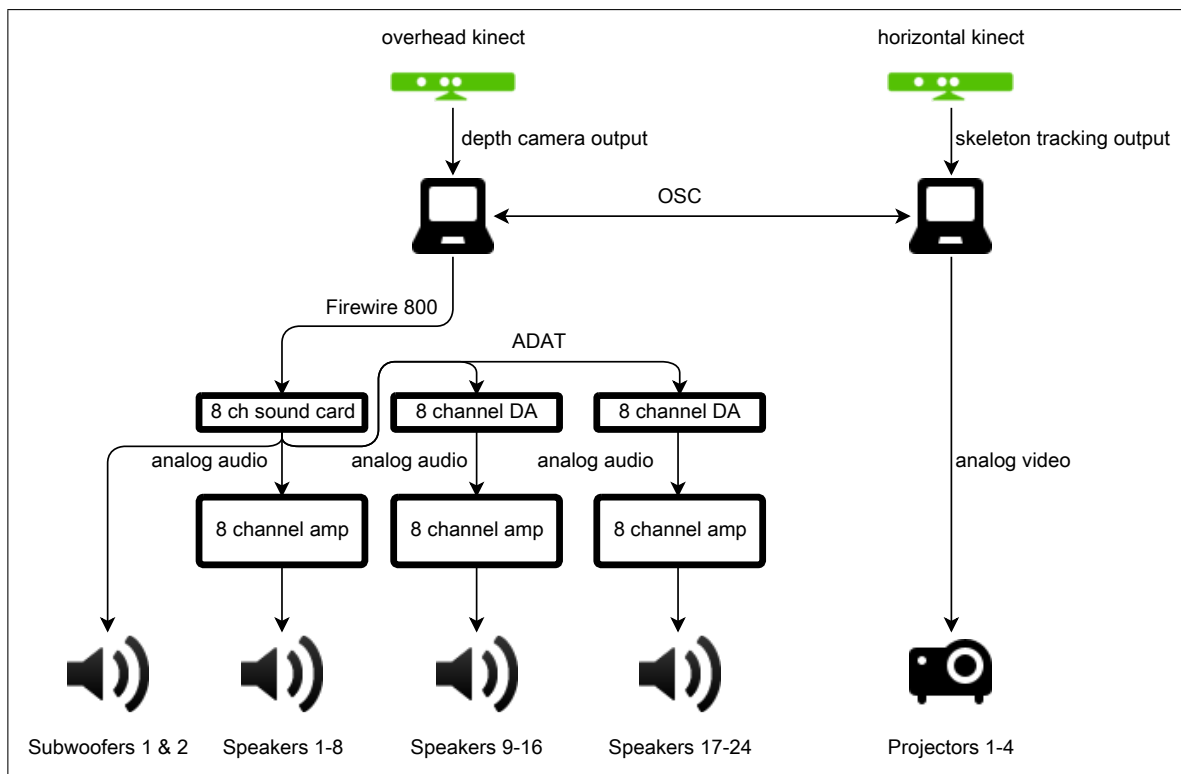


Figure 1. Signal flow in Sound Labyrinth

This material is used to construct a (hyper)realist soundscape: a distant creek bed, slightly to the right of the entrance, with bell birds in the middle distance, and wind chimes to the left. As participants journey through the physical space, the soundscape content shifts, allowing the visitor to pass through urban streetscapes, waterfront ports, desert zones, storms, cathedral interiors, and whatever spaces and locations may be represented by material contributed by the public.

This material functions representationally and symbolically, evoking experiences of the natural and built environment, the sublime in the everyday.

Hidden within these sonic landscapes are fragments of poetic spoken word performances, multi-lingual expressions of the experience of engagement with the transcendent sublime, the prophetic voice of the Other. These spatialised voices are spatially elusive, moving in opposition to the participant, always remaining out of reach while the participant is in motion, but coming to rest in an immersive surround spatialisation if the participant stays still.

In addition to the representational field recordings and narrative/poetic spoken word, synthetically generated sound in the form of spectrally shifting drones, is used to mark entry into a zone of abstracted audio content, in which the participant's gestures and posture inter-actively effect the soundscape. Gestural interaction is two-fold:

- at a passive level, the participant's trajectory through the representational soundscape is generates a spectrally sorted granular buffer constructed from the sequential concatenation of triggered field record-

ings

- at an active, intentional level, the participant can scrub through this granular buffer

The significance of the gestural control aspects of the installation are discussed further in Section 4, however before discussing these aspects, it useful to cover the basic gestural sensor infrastructure.

3.3. Sensor System

Sound Labyrinth uses two Kinect depth sensing cameras: one installed overhead in the centre of the dome, and one installed horizontally at far side of the entrance (see Figure 2). The overhead camera provides input into a Max/MSP patch which uses a cv.jit based blob tracking algorithm to provide participant locations as XY coordinates via Open Sound Control (OSC) to the main sound management and spatialisation patch. Figure 4 provides a more detailed view of the analysis and spatialisation subsystems. The depth-sensing feature of the Kinect camera simplifies the blob tracking algorithm, as the camera subsystem can be set to ignore data below a threshold depth, eliminating the need to separate the subject from the background.

Position within the dome is used to smoothly transition between different soundscapes. The Max/MSP *nodes* object provides a zone-based trigger system which can also provided weighted output from each proximal trigger zone, allowing interpolation between triggered soundscapes.

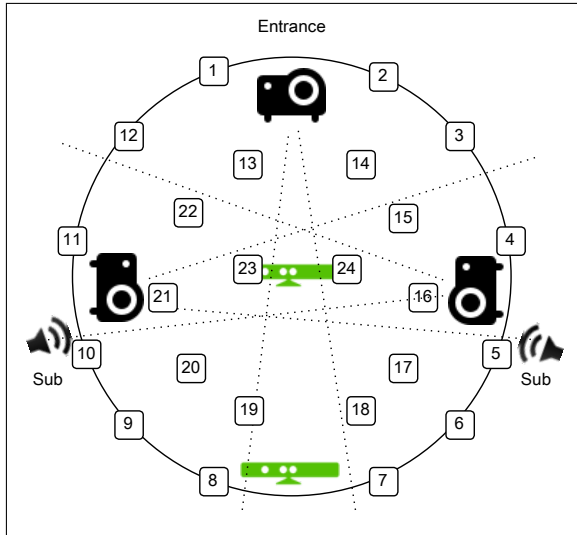


Figure 2. Speaker, projector and sensor layout

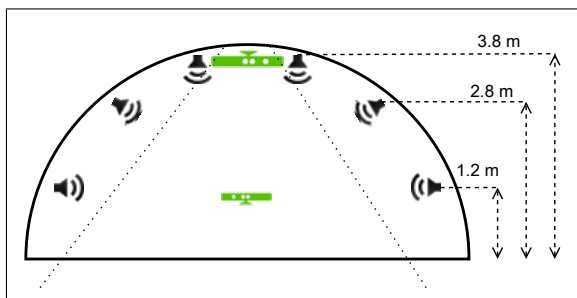


Figure 3. Speaker and sensor elevation

This approach provides a natural mechanism for exploration of the *Sound Labyrinth*, as triggered material fades in and out of hearing in response to position, alerting the participant to some level of agency within the system.

The horizontally installed Kinect is used for gesture tracking of a single participant at a time. The effective range of the Kinect means that participants are only tracked in the rear half of the dome closest to the Kinect. Improvements in the gesture tracking subsystem mean that the system will automatically recognise and calibrate to any humanoid shape within range, without the need for a specific calibration gesture. Hence, engagement of the gestural interaction is seamless with respect to the rest of the installation.

When the participant is within the tracked zone, the visual projection immediately above the Kinect switches to a display which mirrors the participant's gestures. This visual cue assists participants recognise the gestural input capability of the system, by prompting them to interact with the visual display, and thus leading them to discover an additional layer of audio interaction.

3.4. Visual Elements

The visual elements of *Sound Labyrinth* consist of three display zones: one immediately above the horizontal Kinect sensor, as described above, and another two on either side of the entrance (see Figure 2). A fourth projector is used to highlight the structural elements of the dome itself, using full dome projection from a spherical mirror installed close to the entrance.

The visual elements of the installation are designed to heighten the participant's sense of immersion in an alternate environment. The two lateral display zones act to visually evoke the sound worlds being explored, expanding the space contained within the physical dome to also include (the memory of) distant locations, while the distal display zone looks into an abstract realm, inviting exploration, and the full dome projection superimposes an ephemeral "virtual" dome structure on top of the physical structure, hinting at the enfolding of the potential into the actual.

Each display zone is responsive to the position of the participant within the space, changing content as the virtual soundscape change, providing a multi-sensory clue to the participant's agency within the installation. Visual content for the display zones is handled by a separate system running VDMX[2] for content management and playback and Mad Mapper[3] for geometry adjustment. OSC data is sent from the main sound control patch to VDMX in order to trigger changes in content from each display zone.

The content of each display zone reflects the audio content of the soundscape, sometimes directly, such as images of water and reflection used in conjunction with the creek soundscape, while other scenes use more abstract visual impressions, such as layered footage of street scapes and abstracted images of night time traffic used with urban ambience.

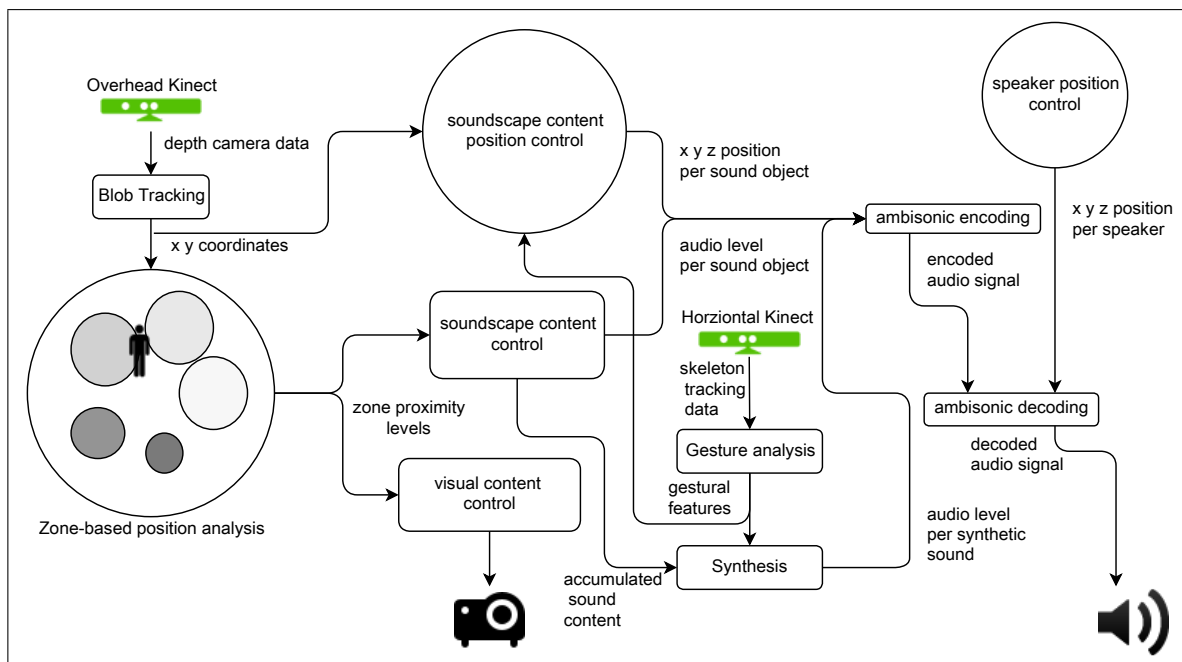


Figure 4. Analysis, spatialisation and synthesis subsystems

4. GESTURAL INTERACTION AND EMBODIED EXPLORATION OF THE SUBLIME

In taking up the concept of the embodied sublime outlined in Section 2, the intersection of the abstract/virtual and the embodied/actual is the space upon which *Sound Labyrinth* focuses. The compositional approach is one of gradual intensification of this intersection. Elements of the installation's soundscape respond to simple movement within the space, gradually progressing from that of a natural environment, to a landscape which is more abstracted (desert winds, snatches of poetry, synthetic drones) as the participant delves deeper into the space of the dome.

At the point of greatest sonic abstraction, the participant encounters a new mode of interaction: one that responds to gesture, rather than just location. Through linking physical gesture and sound abstracted from the participant's own journey through a more concrete, representational soundscape, there is an intensification of the inherent connection between sound and movement posited by Leman. The participant's gesture is imprinted upon the (latent) sonic material, bringing it from the abstract into the actual. In parallel, the participant is immersed in sound: abstracted, virtualised material is not just triggered by movement, not forced upon the participant, but "brought to life" by them, in a sense, emerging from their movement.

There is a form of cybernetic intersubjectivity that emerges as the participant, sensing the connection between sound and gesture, intensifies their exploration of the sound world available to them, while the installation, sensing the participant responds to their gestures, either directly, or in oblique reference. Given the casual nature of the relationship, this temporary fusing of participant and installa-

tion as a combined performative system would fail if the mapping between gesture and sound was not grounded in the embodied intelligence of the participant. Without an awareness of the relationship between gesture and sound, the sounds generated in response to gesture could feel alien and disconnected, and fail to invite further exploration.

4.1. Correlating moving sonic forms and moving physical forms

It is therefore critical to base the gesture-sound mapping upon an analysis of movement and an analysis of sound which work together to enable the kind of multi-level surrogacy described by Smalley. In fact, because of the immediacy of the relationship between gesture and sound, surrogacy is no longer the appropriate term, as the sound gesture is not *replacing* the physical gesture, but is being overlaid in superposition.

This is not to say that, in Smalley's terms, that the nature of the interaction is only at the level second order surrogacy - that of the musical instrument. The intention of the gesture analysis process is not to create an interactive system which acts as a *hyperinstrument* based upon the participant's body, but to observe potential relations between physical movement and sonic forms. The intention is that the sound design for the interactive system is *informed* by the body's relationship to sound, but not to necessarily *represent* that relationship directly.

Rather, in *Sound Labyrinth*, the observed relationship between sound and body, both qualitative and quantitative, are used to select sounding elements which bear strong correlations to physical movements of various types. In this sense the interactive element of the system operates in

Motion Factor	Movement Quality	Synthesis properties
Time	Quick	short percussive sounds (short onset, short continuation)
	Sustained	sustained sounds (longer onset, long continuation, long decay)
Weight	Light	low density sounds with harmonic content and greater reverb, higher pitch
	Strong	high density sounds with greater noise, less reverb, lower pitch
Space	Direct	steady pitch and spectra, less reverb
	Flexible	varying pitch and spectra, more reverb

Table 1. LMA Motion Factors and sound synthesis properties

a improviser/collaborator paradigm, rather than in a performer/instrument paradigm.

Drawing upon Laban Movement Analysis (LMA) [22] I sought to identify correlations between Laban Effort Shapes, as a canonical set of movement qualities, and the spectromorphological attributes of sound developed by Smalley[21]. Marshall [15] takes a similar approach in the application of Smalley’s spectromorphology to the design of an interactive sensor-based sonification system.

In other work comparing Laban and Smalley [9], we observe that it is possible to derive some correlations between the two models: time in LMA relates to both the motion launching (or attack) and the texture quality of spectromorphology; weight relates to the rootedness quality; and space relates to contour. This mapping is imperfect, but is sufficient for us to design the sensing system of *Sound Labyrinth* to support a relatively intuitive level of engagement with the abstracted sound material through gesture. Expressing Smalley’s spectromorphological movement qualities in terms of more common synthesis parameters, we have taken the following approach to selecting synthesis / selection parameters which correspond to various LMA movement qualities. These are summarized in Table 1.

This mapping is used bi-directionally within *Sound Labyrinth*: from participant gesture to sound, as a responsive recognition by the system of participant’s embodied expression; and from the system toward the participant, as a prompt toward alternative gestures, postures and positions.

Using spectral analysis and granular, concatenative synthesis [20], the original field recordings triggered by the participant during their journey through *Sound Labyrinth* are dissected into component particles, and shaped in re-

sponse to gestural input, or in response to synthetic gestures generated by the system.

The gesture-sound mapping described in Table 1 is used to modify the granulation parameters of the concatenative synthesis engine in order to produce the desired sound quality (short, percussive; sustained; light; dense). Spectral selection of grains is also influenced by direct position, where physically higher gestures produced higher pitched material, and vice versa. The use of a mixture of direct gesture mapping as well as effort quality analysis provides both immediacy, which helps the participant recognise their agency with respect to sound generation, as well as subtlety and depth, allowing for deeper exploration of the sound using different movement qualities.

The temporal qualities of the participant’s journey through the physical space of the *Sound Labyrinth* are also preserved within the granular buffer of the concatenative synthesis engine, allowing the various sound worlds encountered to be explored at a new level of perspective - from *within* the sound material - while remaining vestigially recognisable through the temporal grouping of source-related material.

A full discussion of the generative element is beyond the scope of this paper, however in brief, the system operates as an agent-driven physical model generating its own gestures, driven by varying goals such as:

- balance the total energy in the system
- maximise the total energy in the system
- minimise the total energy in the system

where total energy is measured in terms of accumulated gestural velocity of both the participant and the system’s *virtual body* within a given time window. These gestures are mapped to sound in the same way that the participant’s gestures are, using sound as the medium for (gestural) communication between the participant and the system.

5. REFLECTIONS

In reflecting upon *Sound Labyrinth* as a work oriented toward enabling exploration of, or encounter with the sublime, a number of layers to the work emerge as significant.

If the representational sound content operates at the level of memory and association (recalled experience), and the poetic spoken word operates at a linguistic level of thought (abstracted experience), the synthetic, gesturally controlled content operates at the level of sensation (immediate experience), that is, as the level of the sub-liminal. In Smalley’s terms, this material operates at the level of first order gestural surrogacy.

The representational sound is at once specific (concrete), as a recording of an actual instance of water flowing, birds calling, thunder rumbling, etc., and general (abstract), as a *type* of any such instance, by virtue of the generalising operation of human memory extending the specific subject into the abstract object.

The same material, granularised, is at once abstract, in as much as it has been disconnected from its source and is “unrecognisable”, and concrete, in the sense of being *only sound*, disconnected from the objectifying process of recognition.

Upon this material, the specific gestural patterns of the participant, in the form of their exploratory trajectory (their specific personal history) as well as their immediate physical gestures, are imprinted.

This forms the *sublime* layer of sound content, operating beneath the threshold of thought, beneath the threshold of recognition, at the third or, even remote, level of gestural surrogacy. The participant, as an immersed subject within the immanent field of the installation, *embodies the sublime*.

Participant reactions to the work were quite varied. Common feedback from participants included comments on the meditative quality of the installation, that they found it relaxing, immersive, disorienting or trippy. Some wanted to immediately sit still, lie down, and be passively immersed in the sound field, rather than actively exploring it. Others were initially overactive in their movement and took some time to discover the subtleties of the work that are revealed from more careful movement and exploration within the space. The immersive quality of the audio was frequently commented on.

Some participants remained unaware of shift to the deeper gestural control mode, primarily because they continued to rapidly explore the space, and thus moved in and out of the gestural control zone before noticing the additional control layer. Others found the gestural zone added another layer of engagement and spent time exploring this aspect of the work.

Engagement with the visual elements of the installation was strong, always drawing comment from participants. A number of participants connected with the linguistic layers of the audio content, enquiring about the languages used and the content and origin of the texts.

The use of the geodesic dome structure itself also drew strong reactions, with some participants remarking that they experienced a unique shift in feeling as soon as they stepped inside the dome, and often connected the spatial qualities of the installation with feelings of contemplation, calmness and meditation.

From my own perspective, *Sound Labyrinth* functions as a powerful space in which to work with sound. The immersive qualities of three dimensional surround sound connected to gesture and responsive to movement within the space open up the deeper conceptual space of the interface between embodiment and the abstract. The sublime, by its nature, can never be grasped, and there is still much more to explore.

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