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DIFFUSION EVOLVED: NEW MUSICAL INTERFACES
APPLIED TO DIFFUSION PERFORMANCE

By

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An exegesis

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List of DVD Portfolio Contents

- High resolution code diagrams
- nebular performance video
- nebular performance 8 channel interleaved audio files, configured as per figure 17.1
- PDF Document of Exegesis:
Diffusion Evolved: New Musical Interfaces Applied to Diffusion Performance
- *tactile.space* demonstration video

Glossary

Audio Object – the visual representation of each audio file on the GUI.

Control Area – the circular area of the GUI inside the representation of the speakers. Within this area the movement of objects affects the audio in real-time. Outside of this space, objects may move freely without affecting the audio.

Fiducial – in computer science image technology the term fiducial refers to an object in the field of view. In this case, it specifically refers to a physical object placed on the touch table surface.

Gain Factor – rather than being a direct gain, the gain factor is a calculated value that is then multiplied by the audio signal, to give the final gain of each speaker.

GUI – the graphical user interface. The visual aspect of the interface with which performers interact, and via which they receive visual feedback.

Listening Point – the representation of the very centre of the speaker array. Generally this is centred around the position where the performer is standing.

Phantom Source – the phenomenon whereby two speakers' gains are weighted to create the perception of the sound emanating from a specific point source location between the two speakers.

Regular speaker arrays – configurations of speakers that are entirely equidistant. That is, each speaker is the same distance from the centre and from its adjacent speakers.

Spreader – an Audio Object that has been spread out into an arc shape to create a wider sound source.

SweetSpot – the area that a listener can be situated inside and get an accurate depiction of the sound field. The width of the sweet spot is influenced by the number of, and positioning of, the speakers.

Abstract

This exegesis takes a critical look at the performance paradigm of sound diffusion. In making a shift away from the sixty-year-old practice of performing on a mixing desk or other fader bank console, it proposes and outlines a goal towards intuitive and transparent relationships between performance gesture and spatial trajectories. This is achieved by a coupling of the two previously segmented fields within electroacoustic: spatialisation and interface design. This research explains how connections between the two fields and an embracing of contemporary technological developments, with a goal toward increasing the liveness and gestural input that currently limit sound diffusion practice, could extend the art form into a virtuosic and compelling gestural performance art. The exegesis introduces and describes the author's research and development of *tactile.space*, a new multi-touch tool developed on the *Bricktable* for live sound diffusion. *tactile.space* is intended as a contribution to the growing research area of user interfaces developed specifically for the performance of sound in space. It affords performers a new level of gestural interaction with the space of the concert hall and the audience members and redefines multiple standardised interactions between the performer and the space, the gesture, the audience, and the sound in a diffusion concert.