

Framing Spatial Music: Approaching spatialisation through ‘musical paintings’.

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Keywords: Spatial music, mixed-media, sound art

Abstract. This paper presents an on-going project that is concerned with the development of new formats for the exhibition of mixed-media and spatial music works in art galleries. This project was developed as part of practice-based research in composition that investigates new aesthetic possibilities of sound spatialisation.

A variety of unique spaces have been designed to the experience of sound spatialisation in galleries, from Bernhard Leitner’s architectural works in the 1970s to the present, where a variety of multichannel installations continue to be exhibited worldwide. The dimensions of these spaces can be extensive, requiring the use of many loudspeakers, but it can also be minimal. This new project focuses on the latter possibility, taking as a starting point the aesthetics of traditional painting. It attempts to recreate an analogy to the spatialisation of visual objects inside a frame, exchanging visual material for sound.

A ‘musical painting’, a term suggested by the author due to its hybrid form, is composed by the spatialisation of sound inside a small area, in which the spectators position themselves in front of the sound field to experience the composition. These pieces are comprised of an array of loudspeakers and a compact multichannel system hidden behind a canvas. This approach offers a range of possibilities to the field of composition and sound art, as it can be representative (e.g. soundscapes), performative, interactive or conceptual.

Framing Spatial Music: Approaching spatialisation through ‘musical paintings’.

In this paper, I will initially give a brief introduction to the history of spatial music and its practice within different art settings. This discussion will help contextualise an exhibition project that consists of ‘musical paintings’, an alternative way to experience sound spatialisation.

Music is traditionally an art of time, which depends on sequential events to develop meaning. Visual arts, in particular plastic arts, have been dependent on the work’s physical space, whose limits are defined by visual framing. Music, in its own terms, also has space, such as the ensemble space, the audience space, or the combination of these two: the performance space; the room in which the performance occurs (Solomon, 2007). However, the performance space does not always delineate musical limits, as sounds could be perceived without restricted boundaries. For this, music within the physical space can be formless. It is only when the composer decides to tame sound waves to navigate in a three-dimensional configuration, that music receives a space with explicit limitations. When objects of localisation are part of a composition, the performance space demands from the audience their physical perception. This creates a sense of sound field or sound image; therefore, spatial music contains an architectural ‘frame’ that can be closely associated to visual space.

The use of spatial features in music has been historically refined by the ensemble space, from polychoral music of the 16th century to the modern orchestra tradition (Roads, 2015; Rogers, 2013). Choir, chamber and orchestral pieces have distinct seating plans according to style or composition. Initially, these plans have been especially designed to group instruments, equalise acoustics and to develop contrasts between timbre. In the 18th century, many types of orchestral configuration were common: amorphous, single rows, semicircles, around tables, in tiers, etc. (Spitzer, 2004). In certain circumstances, spatialism was a result of

these factors, since several compositions of a variety of periods exhibit dialogues between instruments that produce contrasting localisation effects.

Physical space became more intentionally and widely explored along with the development of modern music. The ensemble space began to incorporate more spatial conversation through contrasting dialogues of multi-layered ensembles or through stage direction notations. The former is evident in the music of Charles Ives, Henry Brant and Stockhausen (Roads, 2015), and mobile instrumentation can be observed in the music of Luciano Berio and Pierre Boulez (Rogers, 2013).

Another approach was to change not only the ensemble space, but also the audience space, such as spreading multiple loudspeakers in acoustically prepared rooms. In 1951 Pierre Schaeffer performed a composition through a four-speaker system called a *space potentiometer* (Roads, 2015). In 1958 the Philips Pavilion sheltered Varèse and Xenakis's compositions (Rogers, 2013; Roads, 2015). Since then, many surround theatres and multichannel systems have been built around the world, such as the Audium (San Francisco), Acousmonium (Paris), the BEAST (Birmingham) among many others. The audience space was also taken underwater, in concerts organised by Michel Redolfi (Roads, 2015).

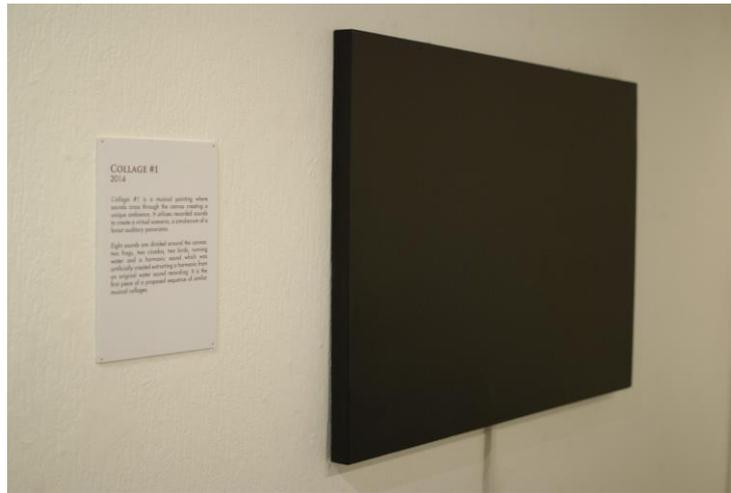
Following up the development of music in other art venues than those made for music and stage performance, new spaces to explore the aesthetics of sound spatialisation emerged. For instance, there are examples of John Cage's music produced between the 1950s and 1970s, which were performed in galleries and art schools. Some of his pieces include music for twelve radios (*Imaginary Landscape No. 4*), for eight tracks (*William Mix*) and for multiple locations inside and outside a gallery (*Variations IV*) (Roads, 2015; Grubbs, 2014). The kinetics of sound in galleries proliferated in the 1970s, when Bernhard Leitner produced several spatial installations in a wide-range of settings, creating sound fields that surrounded the audience in all sorts of geometric shapes, such as cubes, spirals, tubes and others (Licht, 2007).

In the 21st century, multichannel or multiple loudspeakers installations continue to be apparent, some recent examples are Gwen Stevenson's *Infinite Mass* for seven channels, first exhibited in 2008 (MCAC, 2008), and Nye Parry's *Exploded Sounds* for sixty channels (Parry, 2014), first exhibited in 2012.

Sound on Walls

Spatial installations do not always have to be immersive or surround the public. As observed earlier, spatial music shares with visual arts the idea of a 'frame', and in a relatively small dimension, music has been framed on walls similarly to the traditions of paintings. Some examples include the works of many emerging artists, such as Susan Philipsz, Tristan Perich and Pit Noack (MOMA, 2013; Galeria Mário Siqueira, no date).

In fact, the physical space of music can become so close to traditional paintings to reach the point of blending these two arts, and this possibility gave rise to a research project being currently conducted by myself at the University of Liverpool. In 2014 I started to gather material for a solo exhibition on the theme of *music stasis*, an exhibition entitled 'Static Music'. One of the ideas was to recreate a painting with sounds, in which sounds were contained and spatialised inside a frame. Through this concept, *Collage #1* was conceived, an eight channels soundscape comprised mainly of recordings of insects, which were processed to sound static or quasi-static. The aesthetic result was similar to the one of a traditional painting, in which spectators position themselves in front of the medium to have an aesthetic experience.



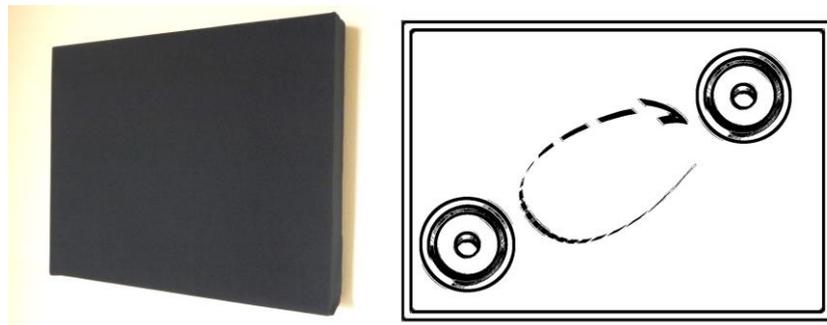
Collage #1: Frozen Night (2014)

After this first experiment, I decide to further explore more the idea of a compact multichannel space, as this seemed to offer a wide-range of spatial possibilities. Many prototypes were developed, using different types of electronics and materials. One thing that seemed to be particularly important to create an authentic analogy to paintings was to eliminate the visibility of any wires. This could be easily completed by drilling holes on the supporting walls to connect power and circuits to the back of the frame, but as not all venues offer this facility, it was necessary to implement compact components and portable batteries inside the frame. For more convenience, I added USB connections to the wooden frames, in order that the paintings could be easily recharged when necessary.

Another technical preoccupation was to make sounds as directional and clear as possible. For this, 2-inch enclosed loudspeakers were selected and canvas substitutes, such as polyester fabric, offered a less-filtered sound. In addition, volume control buttons were fitted onto the frame, offering adaptive control to the acoustics of the exhibition room.

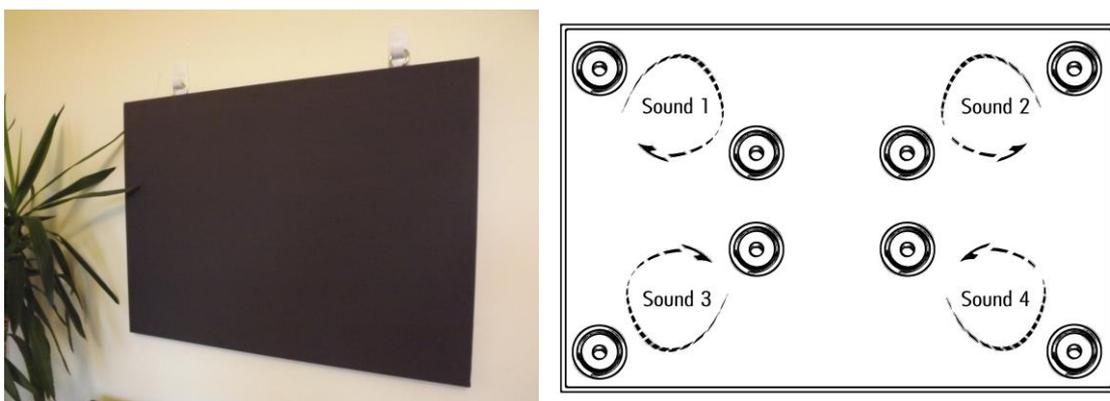
Many spatialisation techniques were experimented in this project. The idea of ‘cinematic stereophony’, as defined by Xenakis, consists of shifting a sound in a line of loudspeakers (Rogers, 2013). Several techniques for creating this effect are now known and applied to sound spatialisation. The simplest is stereophonic panning between two channels. This technique presents not only

azimuth/elevation localisation, as it can also present the illusion of depth depending on the panning law utilised. When humans listen to a sound panning from one loudspeaker to the other, a panning curve may be perceived, in which amplitude appears to decrease or increase in the centre. The most common example is a linear panning law, in which the central sound appears to move away from the listener. (Roads, 1996). Applying different types of panning laws, spatial gestures between loudspeakers can simulate a horizontally navigating sound which also approaches or distances the listener. *Spatial Poetry #1* (2016, 30x25cm) a small musical painting utilising only two loudspeakers, exhibits this feature in a circular fashion.

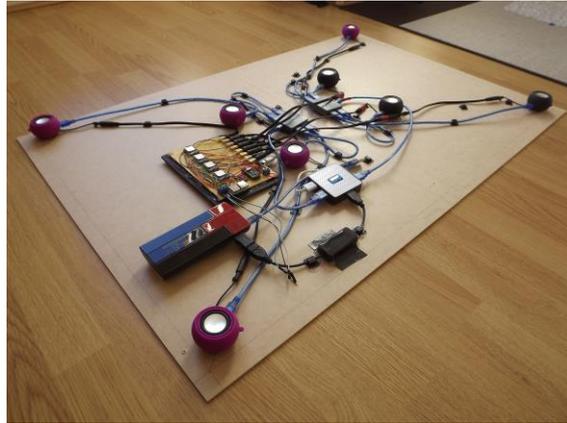


Spatial Poetry #2 (2016)

This same effect was explored subsequently in *Collage #2* (2017, 8 channels, 100x75cm). This piece is an eight-channel composition, which utilises four synthesised sounds, all shifting independently from each corner of the frame to its centre, whilst also simulating depth.



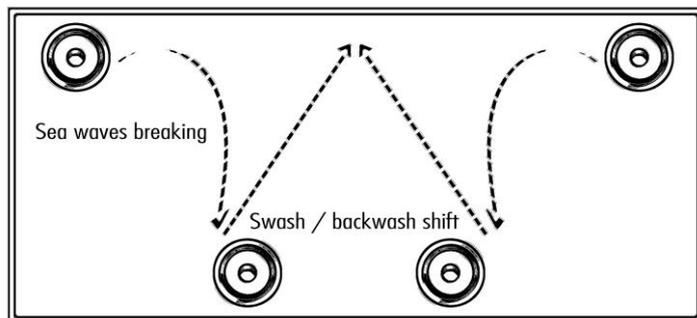
Collage #2 (2017)



Collage #2 (2017) – Internal Structure

Further experiments generated the following paintings:

- *Spatial Poetry #2 (2017, 4 channels, 50x40cm)*: a composition for recorded cello and synthesised sounds in which a synthesised chord shifts aleatory to the corners and the cello follows its path, shifting whilst performing glissandi.
- *The Seashore (2017, 4 channels, 117x35.5cm)*: a 3D soundscape simulation in which sea waves break into the centre of the canvas, and the swash and backwash shift downwards and upwards.



The Seashore (2017)

- *Bi-dimensional (2017, 6 channels, 100x35cm)*: this piece is a mixture of a pre-recorded composition and user interaction. In some sections, the painting performs a spatial recording of a surround composition for flute and electronics, while in other sections, it becomes interactive, as sounds and lights are displaced when triggered by sound and pitch detection.



Bi-dimensional (2017)

- *Battistero, Voci della Terra e del Cielo* (2017, 3 channels, 91x71cm): a recording of a site-specific composition for soprano and tenor at the Pisa Baptistery in Italy, not only represented its peculiar architectural soundscape but also brought up the idea of ‘acoustic reduction’ or ‘spatial miniaturisation’. The two levels of the baptistery were recorded and reproduced in a small painting format, redimensioning the acoustic space to a much smaller scale. The natural delay effect of sound travelling from the ground level to the superior level was simulated through three small loudspeakers, creating an interesting spatialisation effect of acoustic representation.
- *Sound Lines #1: The Earth’s Orbit* (2017, 2 channels, 80x30cm): The Earth’s Orbit represents the frequency of the Earth’s rotation around the sun, multiplying it by many octaves to find a related audible frequency and a related panning frequency. 30 LED lights display the sound trajectory in synchrony with the panning effect.
- *Sounds from Bali & Sounds from Gili Meno* (2017, 2 channels, 80x30cm): These two paintings represent unique recordings of Indonesia. This includes soundscapes of clinking fossils in a coral reef, croaking frogs in tropical forests, flocks of pigeons flying with bells, in addition to some other sounds recorded in August 2017. The visual patterns displayed are authentic batik fabrics made in Indonesia.

- *Sound Lines #2* (2017, 4 channels, 91x40.5cm): this piece explores a new approach to interactive spatialisation. At the same time an electronic composition is performed, the listener can control the stereophonic position of two lines of sound through in-built LDR sensors. The result is a quadraphonic system which includes LED lights, 15 for each line, indicating the current sound position.

This mixed-media method of displaying spatial sounds proved to be suitable for different compositional approaches, as it can be representative, performative, interactive or conceptual. As exemplified by *The Seashore*, soundscapes can be recorded and recreated in a three-dimensional display. The same could be accomplished using cityscapes (currently there is a project in development for this purpose) or any other type of acoustic environment. A ‘performative’ approach would be an original piece, carrying only spatialisation gestures or sequential sounds with finite duration, as in traditional compositions. For instance, a string quartet could be recorded especially for this short-scale performance space. Interactive approaches, such as in *Bi-dimensional* and *Sound Lines #2* can offer the user control of light and space through a variety of sensors.

For being a project in which sound environment is clearly defined by a contained space and displayed in a traditional art setting, the idea of a musical painting certainly appeals to the categorisation of ‘sound art’ (Licht, 2007). However, since there are no aesthetic limitations for these mixed-media pieces, they could certainly be interpreted in both contexts of contemporary music or sound art.

Concerning its uniqueness among so many other sound spaces, large scale installations may present complications as they tend to dominate a large area of exhibition and can be invasive in consideration to other artworks. The presented method offers a short sound field, thus being able to be displayed passively along with other artworks, as well as giving the possibility of sharing an exhibition with similar pieces. The creation of a portable physical frame for music also provokes

the idea of music becoming an object, which can be traded and used for commodity. This conveys a concept similar to Erik Satie's propositions of *musique d'ameublement* (Harley, 1994).

While this project is still in its first stages, there is a large development commitment expected for the next few years. There is a variety of materials that could be integrated and experimented. Until now, most of the visual finishing has been monochrome, not taking into consideration any other visual material. A blend with visual stimulus could also be possible; through paint, LED lights or digital screens.

This paper has presented different environments that have been used throughout history to explore spatial music, along with a novel project that has potential for further development and exhibition.

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