

Reflexionen Festival - Spatialisation in Electro-acoustic Music

June 28th and 29th

A review of the Reflexionen-Festival 2003 written for Earshot 4- the Journal of the UK & Ireland Soundscape Community

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Spatialisation is becoming an increasingly important component of electro-acoustic music, as more and more composers explore these new techniques. Sounds can now be made to come from a pinpoint in space or from all directions simultaneously. They can likewise criss-cross spaces like flies or generate huge fields of static “walls of sound” and artificial spaces. Today, sound and space merge and interact with one another.

Taking place at the Institute for New Media in Frankfurt, the *Reflexionen Festival* set out to present these new developments to wider audiences and provide a forum in which to discuss the topic of space, spatialisation and architecture in music.

Composers and electronic musicians who have explored techniques relating to spatialisation or the aural perception of space and architecture were invited to contribute. The works had to be spatialized or deal with architectural and/ or spatial situations. The music had to be composed for multi- speaker arrays and its spatial qualities had to be perceivable by a wide audience. The winning entries were selected by a jury and programmed during the festival. The aim was to present an array of unique listening spaces.

The presentation of spatialized music requires considerable time and effort, due to the complexity of the performance set-up and the large number of speakers required. A variety of techniques are used in performance today: these may be divided up into the Ambisonic approach, which includes a height component, and the more widespread “pairwise panning” approach, which is generally mixed for eight speakers on a plane.

Unfortunately we had to omit the third approach, Wave Field Synthesis, on account of its impracticality. A presentation without a height component would have required about 300 speakers. 5.1 Surround approaches were likewise rejected, as they are simply an extension of the current stereo approach and have a bias to the front center. An even soundfield in every direction was regarded as crucial.

There were two rigs, which meant that listeners were able to compare the different techniques: one was an 8-channel octagon for the 8 channel pieces and the other a 12+4 dodecahedron for the Ambisonic works. The 8-channel octagon had excellent speakers. The dodecahedron's speakers were smaller but nonetheless sufficed, as in Ambisonics the soundfield is created by all the speakers simultaneously.

The only drawback was that the sweet spot was only accessible by standing on a chair in the middle of the audience area. The general impression was nonetheless satisfactory, as localization was extremely precise at the sweet spot and sufficiently stable in other areas. The room was not excessively reverberant, which is important for a clear image.

Frank Nihusmann – ambient installation

“*Fragrance*” consisted of four stereo CDs, all of which were played simultaneously. Routed to eight speakers, the sounds appeared in different locations, overlapping with each other and adding a background sound to the space, like a fragrance. This permanent installation was designed to welcome visitors to the festival and give them a foretaste of what was to come.

Ludger Brümmer – infinite space

The first prize went to Ludger Brümmer’s eight-channel piece “*Inferno der Stille*”. The granular sounds were mostly derived from an extract of *W.A. Mozart’s Requiem*. They were fragmented into tiny particles of sound, rearranged and reconfigured to densify the content of the original work. One still could make out the sound of strings, brass, woodwinds and the choir. Stretched to vast lengths, they developed in slow motion, rising in volume and becoming increasingly dense. Now and then, these sounds derived from acoustic instruments were counterpointed by brief, metallic sounds generated by a physical modelling algorithm.

Ludger Brümmer used patterns of early reflections in his piece. As the pattern of the temporal and spatial arrival of an early reflection is of considerable importance in distance perception, he was able to extend the sonic space far behind the speakers, creating a variety of large and at times infinite spaces. In terms of direction, all the sounds came directly from (or behind) the speakers. There were no phantom images in between the speakers, but only a monumental space full of sound, which could be experienced through the imaginary windows of the eight channel speaker set-up.

The sonic spaces created in his piece evoked a dark, unending Gothic cathedral, while the extremely loud parts concentrated all the energy on a vertical line in the center.

Joseph Anderson – From musique concrète to abstract sound

The second prize was awarded to Joseph Anderson's "*Kyai Pranaja*", which was performed in the dodecahedron. The piece was made of first order Ambisonic sounds recorded with a Soundfield Microphone. Recorded during an improvised recording session, the sounds were then re-arranged and modified electronically. During the performance, the audience was immersed in the sounds. These came from above, below and all around, even though the overall image remained somewhat fuzzy – a frequent occurrence with first order Ambisonics.

The piece featured the sound of gamelan bells and ceramic bowls being struck by sticks and other objects. From time to time, the original acoustic sounds were processed, engendering abstract sounds. These gradually disappeared, making way once again for the acoustic sounds. The soundfield microphone had been placed right in the bowls: these were acoustically enlarged and magnified over the whole rig so that the listeners were immersed in the sound they produced.

Mesias Maiguashca – sonic sculpture

Mesias Maiguashca's multi-channel work "*Tiefen*" (third prize) consisted of synthetic sounds generated by feedback processes simulated by a physical modelling program. The resulting sounds contained a lot of high frequencies and sounded like e-guitar-feedback, which made them more vivid, but somewhat unpleasant to listen to. The sounds were mixed to eight channels. There were many standing waves close to sine waves, which made localization uncontrollable and dependent on the listener's position. For the most part, the ear was confused and heard the sounds coming from many different directions, even from above. On account of the listener's incapacity to localize the sounds and their chaotic arrangement, the end result resembled a sound sculpture more than a piece of music: this ever-changing tapestry of sound had neither beginning nor end and was perceivable in an infinite number of ways. Accordingly, the audience was invited to explore the soundfield by walking through it, rather than sitting on a chair.

Following the presentation of the three prize-winning pieces, a number of other entries were played, illustrating the breadth of the submitted works.

Natasha Barrett - literature and speech

This piece, titled "*Prince Prospero's Party*" (a reference to Shakespeare's "*The Tempest*"), provided an opportunity to demonstrate the advantages of second order Ambisonics. Barrett used Richard Furse's *V-Space*- program to create depth, locate sounds in 3-D space, and generate three-dimensional reverberation. Some stereo sources were also mixed in to create a broader image than the point sources of second order Ambisonics.

The sounds were sharp, clear and easy to localize, as they moved around the space. Surrounded by ghost-like disembodied voices and dramatic electronic sounds coming from everywhere but the speakers, the audience almost felt as if it was taking part in "*Prince Prospero's Party*"

Tae Hong Park – multiple perspectives

The last piece was Tae Hong Park's "*Aboji*", which featured interviews with workers about their lives. During the performance the audience sat on the floor between the eight speakers, while fragments of speech as well as environmental, synthesized and processed sounds were woven into a dreamlike interpretation of the interviewees' lives. The eight speakers placed in different positions corresponded to the multiple perspectives opened up by listening to several people speaking simultaneously.

Jan Jacob Hofmann – Sonic Architecture

The concert on the following day featured Jan Jacob Hofmann's work "*Sonic Architecture*". It consisted of six pieces using second order Ambisonics, each of which lasted about ten minutes. The electronically synthesized sounds were very diverse: hard, soft, large, small, transparent, grainy or heavy. The interactions between the sounds and their movements through three-dimensional space structured the piece. The audience was immersed in an expressive and ever-changing sonic space.

Twelve speakers were used, which is the minimum required for a second order presentation. It was surprising to hear the sounds moving so far beyond the sphere created by the speakers. At times they were even flying freely through the space. This was probably due to a combination of certain distance clues with second order

Ambisonics, including a pattern of early reflections. Thus the sounding elements were embedded in an artificially created virtual environment leading to a greater intelligibility and transparency of the spatial image.

Conclusion

As *Reflexionen* showed, spatial perception is a vast and fast-evolving area of research – not only sounds, but also the sonic environment can now be modelled very precisely by new signal- processing techniques. By bringing together different approaches, the festival encouraged comparisons and exchanges among musicians and composers. As for the audience, they had an opportunity to hone and sharpen their perception of spatial and sonic data and listen to sounds they had never heard before.

Jan Jacob Hofmann

The festival was conceived and organized by Jan Jacob Hofmann in collaboration with the INM, Frankfurt. A jury consisting of Marc Behrens (electronic musician and photographer), Peter Behrendsen (electronic musician, music journalist and curator), Michael Bloedner (architect), and Bernd Leukert (music journalist) selected the pieces.

Links:

Reflexionen-Festival: <http://reflexionen.inm.de/>

Frank Niehusmann: <http://www.niehusmann.org>

Ludger Brümmer: <http://www.zkm.de>

Joseph Anderson: <http://sfsound.org/tape>

Mesias Manguashca: <http://www.manguashca.de/>

Natasha Barret: <http://www.notam02.no/~natashab>

Tae Hong Park: <http://music.princeton.edu/~park>

Jan Jacob Hofmann: <http://www.sonicarchitecture.de>