"Crossfire" : Project for and octophonic acousmatic piece

Concept

Nowadays the evolution of technology has expanded the possibilities to manipulate the sound in space in order to create new forms of musical expression.
The work on the sound space begins on the support, where the material becomes a virtual image capable to create perceptual illusions, trajectories and different fields of depth.
Thus, the exploration of materials and processing methods in relation to this internal space is the first challenge that confronted the acousmatic composer.
The advent of the multi-diffusion systems have enriched the possibilities of working with space, allowing to localize the sound sources to create a polyphonic environment through the real space, producing dialogues, overlays and counterpoints between speakers, giving relief to sound characters in a sort of sonic theater.

Objectives

This proposal aims to explore the different ways of treating the space in an octophonic piece. The submitted work: "Cercles et surfaces", is oriented in that sense. It is a piece where I intended to develop a formal structure based in the spatial articulation.
My intention is to develop and enlarge some of the strategies applied to that piece, with a new character, strengthen the different layers in the mixing, to create a real Architecture of the space.

The present project, of approximate eleven minutes of duration, is based in the concepts of: field depth, trajectories, fixed points, roaming points, and all possible concomitants of these forms of behavior of different voices within the ensemble. Distance, reverberation, time of absorption, as well as the spectral characteristics of the materials are also factors involved in the development of the project.

Development

In a first stage I will proceed to the exploration of materials in order to create different morphologies. Afterwards I will test different strategies of spatial organization.
For example:

- half circles with one material
- complete circles, changing materials
- zigzag and diagonal trajectories with the same material
- zigzag trajectories changing materials

Alternatively those trajectories will be juxtaposed to separated objects in different directions (contrary movements, following movements, random movements etc)

In order to obtain the wished effects I will analyze the different behaviors of the morphologies in several determined situations.
In my initial research, I have made some observations in relation with the articulation of morphologies:
Masking effect
- Two sound objects placed at 5 meters and 15 meters from the listener, respectively
- The two objects have the same amplitude and the same duration.

- The object 1) comprises a band of frequencies between 950Hz and 1500Hz, the object 2) between 1200Hz and 1550Hz.

Perceptual effect: if the object placed at 15 meters is the one that has the highest band, it will be masked by the closest.

Envelope effect

- Two objects spectrally close, including a wide range of frequencies, are placed in front and background respectively.
- One of the objects has a soft attack and a long sustain, the other is rather dry.

Perceptual effect: the resonance of the first will be absorbed by the components of the second; contributing to create a wide and enveloping perceptual field effect.

Speed and location

- In circular or zigzag trajectories auditory perception depends on the size of the object and the moving speed. If it is very short objects or grains, moving at high speed, it will be impossible to determine the direction of displacement, the minimum time required to discriminate between two sounds is 20 milliseconds.

Density and displacement

- In a complex conglomerate, of more than 4 layers of contrasting material it is possible to determine the direction of movement of each voice, only if they move at different speeds and in distant locations.

This brief list of possibilities indicates the importance of an acoustic study prior to the creation of morphologies, syntax and dynamic network of the future music.

Materials

Analyzing a recording of New Year Fireworks made in a large space outdoors, I could observe several interesting perceptive effects:

- Simultaneous crossed Doppler in different frequencies and timbres
- Whistles coming from very far distances, describing long trajectories up and down
- Low reverberated explosions
- High and brilliant cracking

Etc.

The ensemble of all these effects crossing simultaneously the large space create a mass of varied sounds, producing a very impressive surrounding sensation. The relation between distance/amplitude; speed/frequency-timbre, creates a kind of Doppler envelope.
In the present project I will intend to re-create this virtual space, to simulate an outdoor ambiance, combining materials of different characteristics and distributing them into a multi-tracks format.

The choice of sound sources will follow the direction and type of trajectories, for example:

- Surfaces of great density, running in continuum in different directions.
- Granular surfaces into high, low and medium bandwidths, interwoven with:
- Medium size objects in different ranges of frequency, for complex and fast movements
- Short objects, for ornamental effects.

Etc.

These groups of materials will move in three plans of the space (far, medium and near), designing spatial trajectories as mentioned above. I plan to use some of the recorded firework sounds and sounds of other different sources, in order to obtain a large scope of frequencies, amplitudes and timbres that allow me to manipulate and to get an extended collection of materials.

Technical requirements:

Concerning the process of treatment of materials I will use my own equipment and software : Mac computer, system OSX 10.5.8, Digi003 interface with Pro Tools software plus several plug ins (Waves, Grm Tools, Kontakte, and others); and those that can provide the studio of ZKM.

Also to create the sensations of different simultaneous effects and to control the different plans of depth, I would like to explore the possibilities of the Zirkonium system developed by ZKM.

Expecting that my project will be of your interest, I stay respectfully yours,

Dr Elsa Justel

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