Applications of Typomorphology in *Acute*; Scoring the Ideal and its Mirror.

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Abstract — Acute, is a music score composed by the author of this paper, for Percussion Quartet and Fixed Media (tape) using 'Searched Objects' as instruments. This paper examines how this piece recontextualises existing research in Typology and Morphology of Sound Objects to produce a unique music mixed-media score, for the exploration of the sonic possibilities when confronting the 'ideal' (sonic object to be found) with 'the reconstruction of itself' through time (when performers attempt to recreate the given sounds) using processes of Spectro-gestural mimesis.

I. RECONSTRUCTION OF INSTRUMENTAL FORCES

A. Found Objects vs. Searched Objects:

The concept of 'Found Objects' has been extensively explored and discussed in composition and improvisation environments, especially in percussion pieces [1]. However, by introducing the idea of 'Searched Objects' as an extension of it, I was confident that there was scope for another twist, if methodologies and creative thinking from the field of Acousmatic Music and experimentation with sonic memory and experience were performers' introduced. To explain what Searched Object means in Acute's context, we start with the music score, the notation of which is totally fixed but the instrumentation not physically determined. In other words, the composer has not specified what exact percussion resources have to be used. Instead, the instrumentation is sonically provided on a Compact Disc and a chart, as a collection of 44 very short sound samples recorded and edited on a computer. Those sounds are strategically distributed among the four percussionists.

 TABLE I.

 EXCERPT OF A CHART PROVIDED TO PERFORMER ONE, INCLUDING

 EMBEDDED AUDIO. SONOGRAM AND DESCRIPTION OF THE FILE

 PERFORMER ONE

number in score audio file SOURCE DESCRIPTION WAVE / FFT -SPECTRUM PLAY DURAlow roaring start 1400 with high freq ending 6 cute_5 ms ame as cute_5 but mid-high 500 7 cute_6 ms frequencies As cute_6 but 500 8 cute_7 reversed ms glassy attack with 500 9 cute_8 dumped ending ms oins falling onto a 4000 10 cute 9 resona ms pipe/tank long sustained 6900 oaring sound with sand textures 11 cute 10

Kontakte Percussion Group [2], the performers who commissioned this electro-acoustic score, had therefore to make extensive use of their acute sense of hearing and their prior performance experience by calling on their sound memory and creativity. After listening to the sample, they had to 'Go and Search' for the necessary physical objects and 'Invent' the gestures and microphone techniques to reconstruct each of the forty-four samples, in order to determine the instrumental forces, (thus the term Searched Objects was created).

During this process of reconstruction, which involved microphone experimentation and techniques, performers were assisted by a sound engineer, who also produced the CD recording of the piece in the summer of 2007.



Fig. 1. A more detailed sonogram and ensemble leader (Miguel Angel Orero) reconstructing the gesture in the sonogram using searched objects

II. APPLICATIONS OF TYPOMORPHOLOGY; A STEP FURTHER

A. Score Recontextualisation

This score is a recontextualisation of existing research in Typology and Morphology of Sonic Objects started by Pierre Schaeffer in Traite des objets musicaux, 1966 [3], continued among others by Dennis Smalley, Spectromorphology, 1997 [4], and reunited by Lasse Thoresen, Spectro-morphological Analysis of Sound Objects, 2001-04 [5].

The musical score, including the computer part (fixed media) is a journey for creative exploration of theoretical concepts such as Sound Spectrum, Spectral Brightness and Pulse, using live sound objects which function as another layer of a fixed media part. The fixed element (the tape) was created exclusively with the already mentioned 44 very-short materials, aiming to find beauty and musical expression in the matches and divergences between the

original recording (the ideal) and the mimetic sound designed live by performers (the imitation of the ideal).

B. From Spectromorphological Analysis to Notated Sound

Although Thoresen developed this theory of Spectromorphological Analysis of Sound Objects for the analysis of acousmatic music pieces, my intention was to reorient his findings towards writing a musical score (notated sound). I wanted to describe in an precise way, how after solving the Searched Objects puzzle, the final instrumentation should be intervened and how performance would highlight timbral, textural and morphological aspects of the sounds, which finally constituted the heart of the music composition.

TABLE II. CLASSIFICATION OF SOUND SPECTRUM NOTATION IN $\ensuremath{\textit{ACUTE}}$



Table 2 Score legend is a chart for performance instructions to define Sound Spectrum, based upon typomorphology vocabulary.

C. Scoring the 'ideal' and the 'copy of the ideal' thoughout the Typomorphology of Sound Objects

The idea of exposing the 'ideal' or 'model' (the recorded sound provided) to its closest possible 'copy' (the encountered object and methodology to reproduce the original sound) is informed by early pioneer Film work by Andrej Tarkowskij [6][7], (Solaris, der Spiegel etc). As a matter of fact, what Tarkowskij does is to contextualize in his media the theories of Marx and Hegel, where Marx criticises Hegel's thinking that the 'ideal' determines the 'material', and suggests the inversion of the primacy of the 'ideal' (consciousness, thought, ideas), over the 'material' (world). In other words, the material determines the ideal and not vice versa (opposite to the starting point of Acute). Marx goes beyond his own thinking, and denies the very existence of the 'ideal' as a separable entity [8].

In Acute, the 'ideal' is given, (the 44 brief samples' guide to reconstruct the instrumentation) and it must determine the 'material' (physical objects / sound sources allocated to attempt to reproduce the 'ideal') as in Hegel.

To give another twist to the theory, I consciously transformed some of the given brief samples with loose reference to its source and made them nearly impossible to reconstruct by acoustic means. As with Marx's ideas, I wanted to question the possibility of achieving the 'ideal' by creating it as some sort of abstract form but still scoring it as precisely as possible, using the principles of typomorphology.

The score pushes this strategy even further and makes its sonic discourse out of *sculpting in time* [9] both 'source' and 'mirror' and exploring the thin line between the two.

In this electro-acoustic music composition I wanted to investigate the scope for sound exploration when chasing the creative sonic possibilities resulting from a process of spectro-gestural mimesis between the computer-generated sample and the acoustic sound imitating it. I found refinement of musical expression in the divergences between 'model' and 'copy' but also in the similarities and the coherence between the acoustic and fixed media materials (the tape).

D. Notated methodology; a brief explanation:

Performers need a headphone monitoring system to hear the click track and voice track. In Figure 2 below, Mk i cues are rehearsal marks and key points of synchronization between tape and instruments. P1 (Performer one), will play the set of Searched Objects number 8 (which refers to sample 8 reconstructed by the performer) at 1 min. and 10 sec. The little triangle attached means to execute 8 with a Sharp Onset. Dynamics are forte to piano subito and a pause is needed. The sound spectrum to be achieved should have more noise content than pitch. Then object 8 needs to be performed in ascending tremolo and dynamics for less than two seconds. After 1:13, the same kit (8) should be performed but searching for a sound richer in pitch and harmonics (the kit should have both choices) and should be executed creating an 'unstable' continuo for 4.5 seconds.



Fig. 2. Score except including the Tape part and one instrument

E. Structural Rhythm

The articulation and structure is entirely driven by rhythm. However, it is not just understood as rhythm in musical terms but as *pace*, informed by Tarkowskij's methodology, which is not focused on the Temporal Editing but on the Rhythm of the Scenes (sculpting in time); in Acute terms, it refers to the pace of different Sonic Scenes with a characteristic typology.



Fig. 3. Score: Sonic Scene excerpt of Acute with an embedded pace.

The full score on pdf format and an mp3 version of the piece can be downloaded from here [10].

F. Aspects of Typomorphology being observed and notated:

- Sound Spectrum in discrete and continuous form explores different degrees of pitched, non-pitched and complex-bell-like sounds, including onset of offset variations, (see Table II).

- Spectral Brightness (including degree of darkness and morphing in discrete and continuous form)

 TABLE III.

 CLASSIFICATION OF SPECTRAL BRIGHTNESS IN ACUTE



- Exploration of dynamics (including variations of Onset/ offset) and degree of Textural Granularity, among others.

TABLE IV. CLASSIFICATION OF DYNAMIC RANGE AND ONSET IN ACUTE



- Interlocking and Gesture: between live percussion sounds (imitating the sources) and fixed media (constructed with those sources). Sculpting-time techniques included strategies to blur the differences between the 'image' and its 'mirror' and to explore musical expression in the divergences.

III. CONCLUSIONS

This paper has discussed the implementation aspects of Schaefferian Typomorphology in a mixed-media piece for percussion called Acute. With the introduction of the concept of Search Objects (after Found Objects) in this context, the author proposes a new route for creative expression, informed by Tarkowskij's ideas and methodologies in Film, when exposing the *Ideal* to *its Mirror*. Similarly, the score utilizes vocabulary and grammar from areas of Spectromorphology to precisely notate sound and gestures, which imitate the original aural models generated and transformed employing computer and recording techniques. An explanation of the existing methodology to read and interpret the score leads to some detailed examples about how to notate in time concepts such as Sound Spectrum, Spectral Brightness and others which belong to the Schaefferian vocabulary.

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Fig. 4. Recording Session of Acute. Kontakte group reconstructing Sound Sources as Instrumental Forces

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