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Tool / Game / Environment:

The Interactive Multimedia Thesaurus & Playroom

The Multimedia Thesaurus and its expansion into the Interactive Multimedia Playroom (IMP) are both designed to facilitate the development of an array of tools, techniques, and strategies for exploring sounds and their latent and potential correlations with space, light, colour, image and movement.

As an integral part of the objectives involves the development / refinement of a vocabulary suitable for discussing our perceptions of and responses to sound in artistic contexts, it seemed ironic that when called upon to give a verbal report at the EMS-05 conference, immediately after the inauguration of the physical installation, I appeared 'tongue-tied'. However, even at the time, I believe that my speechlessness was recognized by colleagues as an understandable reaction to the dizzying array of possibilities of the adventure, rather than as a sign of failure.

The project itself is described in detail elsewhere; a brief description given in the Appendix, in conjunction with a few images, should help orient or remind the reader.

The inauguration itself did succeed in reaching its objective of stimulating good discussion and even more good reflection, as has been confirmed by talking with several of the participants and visitors subsequently. Several of us were startled by the potent effect of transforming sounds from their usual state of invisible and ephemeral to that of (apparently) tangible and persistent. The ability to physically move and place, revisit, and replace a sound clip in a three-dimensional space has a clear attraction; the question of why we are not simply working on the computer in virtual screen space has disappeared since the physical installation has made its appearance.

The presence of the *frelia* installation and its creators¹ was particularly interesting in its underscoring of two basic design principles of the Playroom & Thesaurus : human scale and usability. We invited *frelia* as the project seemed to be very close to something we wished to include in the Playroom - an instrument that would allow for manipulation of sounds according to intuitive gestures - and its playful qualities seemed close to those of the Playroom. The physical shape of *frelia* was not necessary to the manipulation of the sounds - which could be done with the incorporated Wacom tablets - but by extending the stylus into a large stick which demanded full body movement to manipulate, it transformed the actions into more performative ones. This helped engage the participant and also seemed to permit a finer tuning of the results. Likewise, the size of the 3-D grid manifest in the Thesaurus clearly turns the rather academic process of sorting clips into a game. One of the experiments which remains to be done is to see whether in fact people make slightly different judgements on the

¹ Robin Mandel and Ali Momeni ; *frelia* was originally commissioned by the Music Technology Group for the ICMC 2005, Barcelona.

room-sized grid than they do if responding to the same stimuli on a small computer screen, where they have to move things virtually.

Fortunately, participants and visitors were very tolerant of the extremely primitive qualities of the prototype, although we noticed that the more performance-oriented people were more irritated than the theorists by the high latency of the barcode-reading process. It emerged that their irritation was due to a sense of the project's potential as a kind of real-time compositional or performance tool if the latency problem were corrected.

The potential of the project to move in many directions was the essential cause of a great excitement, slight bewilderment, and resulting inarticulateness which emerged at the report. It was also for some a cause of a certain frustration, as the directions for advancement were so diverse that it was unclear which path should be taken. As we have been somewhat unwilling to choose one path over another, we have continued to experiment with demonstrating the installation in a variety of settings and disseminating information about it.² The intention at this point is to develop the project in whatever ways match both the expertise of those team members who have time and energy to invest and the objectives of the various funding agencies which can be found to support the research.

The project holds several implications for the musicology of electroacoustics. Naturally, most of the aspects of the project which are not specific to the electroacoustic world are still relevant for us as well. For example, the development of an environment conducive to discourse among experts is not only beneficial for electroacoustics as much as for other areas, but it also encourages discourse between those in electroacoustics and those in other areas of music (as well as the other arts), and thus helps break down some of the barriers which are often sensed between ea and "traditional" musicology. Likewise, the presentation of excerpts from ea works amidst others from the instrumental concert repertoire, pop music, film music, etc. can illuminate one genre by another and thus focus attention on commonalities and distinctions between different styles.

The setup of the project has been designed to facilitate the incorporation of psychological research into electroacoustic music analysis (and vice versa). Perceptual studies are not by any means foreign to electroacoustics, and we can imagine several reasons for this. To some extent, it may seem quite reasonable that those working in the early days of computer music who needed to describe sound on its atomic level in terms of frequency, amplitude, temporal duration, etc. would find it a small leap from acoustics to psycho-acoustics; the once-familiar text by Winckel³ supports and reinforces this little leap, and Meyer-Eppler's knowledgeable contributions to the Cologne school likewise underlines the proximity of the fields. One could go farther and suggest that those who pursued electroacoustics in the early days were by nature more prone to, or at least comfortable with, thinking about music and sound in systematic and often scientific ways, and thus more at ease with using other fields of study as potential means of studying music. Once a composer, teacher, or student recognizes the usefulness of analogies from information theory for the transmission of music from composer

² The initial version of the Playroom was inaugurated in the fall of 2005 in the Hexagram facilities at Concordia University in Montreal. It has since been demonstrated in four other settings in Montreal, and a portable version was shown in Barcelona (ICMC) and Aveiro, Portugal (DeCA in Festa); a verbal presentation has also been given at the University of Prince Edward Island. One future installation is confirmed (Oboro Gallery, Montreal - April-May 2007) and invitations for other installations have been received from various venues internationally.

³ Winckler, 1960/1967.

to listener, for example, the distance between music and psychology decreases.⁴ Those who wished to explore the difficulties encountered by the “traditional” listener, whether in the absence of tonality or in the absence of performers, also found it useful to study the factors influencing perception. Ligeti, for example, drew on psychological arguments for his working out of compositional strategies depending more on statistical fields than on discrete pitches, in response to his recognition of the cognitive difficulties of hearing series in 12-tone music.⁵

A central concept of the IMP is that it is designed to encourage awareness that there are, or should be, a variety of available analytical approaches. I have previously argued my case⁶ that electroacoustics could profit from such awareness, while several colleagues in the musicology of ea - as witnessed by the EMS presentations - are demonstrating their ability to propose some particularly revealing strategies that can contribute to the understanding of instrumental works.

During the development of the physical format of the IMP, we found it useful to imagine the participants’ interest as being drawn to focus either on the mood of a particular segment, on its physical sonic characteristics, or on an association produced by the listening experience (which could itself be related to an impression of the sound-producer, a link with movement, or more vaguely to an emotional response). A participant may have a tendency to respond to the majority of examples in a single one of these modes, but the excerpt itself may also prompt the usage of one mode over another; this led us to talk of “salient characteristics”. We began to imagine a more complex sorting area than the one cube represented by the chains, in favour of three cubes or more, each adapted to one of these modes. The participant would then make an initial choice to place the clip on the “mood cube”, the “sound cube” or the “association cube”, for example. This kind of imagery of multiple cubes is a strong argument in favour of developing a virtual version, as it might permit an interesting visualization of data if two or more of the cubes shared an axis label.

Given the existence of mapping of mood and some sonic characteristics onto 2- and 3-dimensional charts, we had imagined that the cube represented by the chains would be quite appropriate. However, we discovered that some categorizations were clearly awkwardly presented at best on any kind of axis; those who would like to express association of sound with colour, for example. Although one could represent all colours in a circle with luminosity as the vertical axis, for example, this would give little option for describing multiple or shifting colours or patterns. We are currently studying other investigations into this area. In addition, we found it useful, when setting up the installation for demonstration purposes, to arrange the clips on “pre-sorting” rods or in bins [see Figure 1]. Thus, people could choose clips by such categories as “urban”, “signal”, “human”, “nature”, etc. Although it is our intention to have a descriptive page in a database associated with each sound, partly in order to allow this kind of pre-selection or filtering, the physical set-up of the pre-sorting categories implies more flexibility of interpretation of the association.⁷

⁴ My introduction of the principles and examples of auditory scene analysis (see Bregman, 1990, and Bregman/Ahad 1996) to the first-year undergraduate class in electroacoustics at Concordia was sufficiently successful to become integrated into the curriculum.

⁵ Ligeti, 1958/65.

⁶ Mountain, 2004.

⁷ In fact, some clips have stimulated lengthy discussion among team members over their “correct” placement on these pre-sorting rods.

A non-negligible aspect of the project, which remains untested, is the evaluation of perception of particular configurations and specifications of sound based on the speakers and their placement. Thus, groups of people could be asked to sort a small selection of clips according to fixed axis and bin labels, with different speaker systems and placements, to study the influence of the sound reproduction on the identification with a particular characteristic or set of attributes. One imagines that some sounds and some terms would be more susceptible to change; energy level and tempo might well be perceived as similar regardless of the reproduction quality, but clarity of texture or level of dissonance might be affected.

We discovered quite quickly that the term “complexity” tended to be interpreted differently depending on whether or not the participant was educated in electroacoustics; those with an ea background (especially students) often tended to assume that the term referred to timbral complexity, whereas others would associate it with melody, harmony, rhythm, or sheer recognizability. Thus, the sound of rushing water was often identified as complex by those who focussed on the micro level, whereas others found it very simple due to the overall lack of change.

Probably the most important aspect of the project for ea is its emphasis on aural analysis. As musicologists in our area are by necessity the pioneers in this field, the project also helps demonstrate the high relevance of writings and other resources (such as EARS) in our field, while also providing an excellent opportunity to test out some of the terms and concepts proposed in those works.

It is too early to gauge the impact on electroacoustics of the image and movement aspects of the project, but they may help us better understand the “something-to-hold-onto” factor. In addition, it seems that we need to have better critical tools for articulating our reactions to the growing number of video and other mixed media works being presented at conferences and festivals of electroacoustics, such as Elektra and ICMC. Some of these are clearly more effective than others, but can we say why? Perhaps more importantly, do we agree with each other on which ones work and which ones don't? I have a hunch that some correspondences are very natural while others are less so, but that hunch needs testing. Fortunately, it seems that the IMP will be able to provide an excellent context for such testing.

In summary, we believe that the IMP is moving towards the fulfilment of its objectives, and we welcome more researchers from different disciplines to participate. The objectives are lofty, but we are convinced that the activity of creating the paths and exploring them are rewarding in terms of understanding, improved communication, and sheer enjoyment for most of the participants.

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APPENDIX - project summary

The Interactive Multimedia Playroom is presented as an installation whose focus is a playful tool called the Multimedia Thesaurus, designed to encourage the exploration of the ways in which individuals and communities may interpret and describe sounds. The Multimedia Thesaurus has a physical manifestation of hand-held objects, bins, and chains. The hand-held objects ("clips") are each labelled with a unique barcode which, when scanned, triggers the computer to play a short sound or to show a (silent) video clip or still image on a screen. Each sound and image clip has an associated database entry in the computer, listing various types of information relating to the clip – from source and copyright information to objective and subjective descriptions of its characteristics. The physical framework of the Multimedia Thesaurus itself can exist in various formats ranging from a small set of sorting boxes to a large area of a room where chains hang in clusters or in a grid.

Participants (usually in groups of two or three) choose a subset of sounds and images with which they wish to play, and then "sort" them into meaningful groups according to similarity of salient characteristics. Sorting into bins is considered the basic version of the game; arranging the clips by hanging them in different positions on groups of chains allows for more subtle differentiation. A more complex format is the sorting of the clips into a 3-dimensional space onto chains representing a cube, in imitation of the 3-D grid traditionally used by psychologists to present similarity ratings. Labels for sorting may be selected from recommended lists or invented by the users, and may consist of colour swatches, diagrams, words, etc. Some axis labels refer to specific musical or visual parameters, while others refer to more general characteristics, mood, association, etc. The clips themselves are being selected to provide a full array of musical styles and instrumentation from repertoire around the world, as well as everyday sounds, speech (of various languages and emotional states), and sound effects. Each time a person or group "sorts" a set of clips, this information will be added to the database, allowing for the accumulation of rich data banks.

A user (or "player") can also scan a still image or video clip, and while looking at it, scan a sound clip to study the interaction of the two. By isolating short fragments of sounds and video, and by associating the usually-ephemeral sounds with hand-holdable objects that are infinitely re-scannable, users find it much easier to compare, trying different configurations (same sound with several images and vice versa). In addition, the playful and generally inviting nature of the project encourages people to play, and hence to enter into discourse about sound and image. By doing so, the words used to talk about the images and sounds become naturally more refined, as we move towards more articulate means of expressing our perceptions and reactions.

More details can be found on the website <www.armchair-researcher.com>



Figure 1. Sound clips on the pre-sorting rods and clustered with a video clip



Figure 2. The Thesaurus chains



Figure 3. The Z axis - complexity increasing towards ceiling



Figure 4. Discussions emerging from the placement of a clip by one person.



Figure 5. Robin Mandel & Ali Momeni in front of *freliä* - IMP team members in background.

