PLAYFUL TOOLS, SERIOUS QUESTIONS

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1. INTRODUCTION

The *Interactive Multimedia Playroom*[1] is a research project that explores the diverse ways in which people identify & describe sounds and sound - image combinations. The Playroom is characterized by a mixture of technology and traditional aspects in a playful and easily-navigated environment, and is set up to link closely with other research projects both locally and internationally.

The paper gives an overview of the project and suggests how it can function as a tool for investigating our perception of various acoustic properties of sounds. Short sound and image files, triggered by the user through barcode technology, are associated with descriptors in a 3-D space or in sorting bins. An installation of the project is presented in the Hexagram - Concordia Black Box during the conference, and for the first time in the project's development, there will be 3 different 3-D grids to encourage users to 'sort' the clips by mood, properties, or sound-image interaction, as well as means for indicating colour associations. The tool can function at various levels: to encourage users to discriminate between subtle differences in acoustic properties of sound, to test the relevance & accuracy of descriptors used by acoustic researchers, or simply to explore the diversity of associations with sounds of different kinds.

The current report is an update on the project, subsequent to its first major public installation. The report has two major aspects: explanation of the physical setup (through verbal and visual documentation) including several new components and refinements of previous aspects; and summaries of feedback from collaborators, research assistants, and visitors to the installation. The feedback is being received in several formats, ranging from formal data collection to observations by the research assistants (who often act as guides) on the delights and difficulties encountered by users. The report concludes with projections of future developments.

[1] Funded by Hexagram Institute for Research & Creation in Media Arts & Technologies (www.hexagram.org) - a dynamic 80-member media arts institute founded in Montreal in 2001 by Concordia and UQAM; now with several academic & industry partners.

2. BACKGROUND

The *Interactive Multimedia Playroom* is formulated to explore the various ways in which people may listen to, think about, and classify music and music-image-movement interactions. The *Playroom* was developed out of the *Multimedia Thesaurus* project, which presents users with a framework and specific banks of sounds and images to be "sorted" according to their salient characteristics. The *Thesaurus* aspect can also serve to investigate human perception of the acoustic properties of sounds, and the potential impact of visual aspects on that perception.

The project emerged from various concerns of the author in her various guises as composer, musicologist, and professor with long-standing interest in cross-disciplinary research and art-forms. In particular, her work in the composition and, more recently, analysis of electroacoustic music has led to her to appreciate the blurring of boundaries between that field and acoustics.

The *Playroom* is structured to function as a stimulant to discourse and collaboration, and is also designed to facilitate a scientific study of the area. By incorporating physical representation of 3-D grids, it familiarizes its participants with the psychologists' study of perceptual discrimination, similarity ratings, and terminology. The project employs a set of research strategies that lie halfway between those commonly used by the humanities and the sciences, designed to address the shortcomings of each.[2]

The IMP project has been presented to a variety of academic communities, including electroacoustic and computer music, music perception & cognition, and music information retrieval conferences. Further background information can be found in the proceedings from these previous presentations.[3]

3. RELEVANCE TO ACOUSTICS

The Playroom can be used in a variety of ways. For those involved with acoustics, three of these seem most relevant: pedagogy, research into perception, and vocabulary.

[2] The approach is outlined in the Armchair Researcher project – see author's website www.armchair-researcher.com

[3] Details on website under "Writings".

Pedagogically, it is an engaging tool for children & adults alike, and the tangibility of the clips helps compensate for the ephemeral nature of sound. Sounds of instruments or acoustic phenomena can be demonstrated easily, and matched with appropriate visuals and terminology.

Its suitability for research into perception ranges from the specific-such as a comparison study of speakers or room acoustics-to more fundamental issues which can benefit from conversations among experts in relevant fields, including sound engineers, sound designers, musicians, cognitive scientists, etc. The project design enables interested colleagues to import clips of their own into the Playrooms giving access to wider response as well as contributing the flexibility and easy interface that is pat of its fundamental design.

Vocabulary is one of the main interests of the project participants, as many who work with sound come from different fields whose usage of terminology is often at variance, and sometimes in direct conflict. Without presuming to establish a common vocabulary, the project aims at least to sensitize participants to the diversity of interpretation in descriptors such as bright, grainy, or low; it also enables participants to grasp quickly what another person or discipline means by a specific word.

4. DETAILS OF DESIGN

The installation has various types of components: the media itself, the computers and software for triggering the playing of the media, databases, sorting labels, explanatory texts, reference material, illustrative props, furniture, the SmartBoard and video camera, and the chain grid. Although many of the components can be viewed as 'interim' in their current state, all of them are considered fundamental to the project design.

Physical handheld objects are linked via barcode to short sound, still image, or video clips in a computer bank. Each clip is also linked to a specific database entry, giving source and copyright details, characteristics, and other useful data. A user (or "player") can scan a still image or video clip, and while looking at it, scan a sound clip to study the interaction of the two. The players can also sort the clips into trays, onto racks, or onto a position on one of several chains that together represent a 3-dimensional grid representing those used by psychologists in similarity ratings.[4]

The sound clips chosen for the conference installation emphasize acoustic characteristics of timbre, amplitude envelope, pitch variation, and spatial properties; and include the representation of a variety of styles, instrumentation and cultures, as well as sounds from natural and urban environments and examples of auditory streaming and other psychoacoustical phenomena.

In order to help clarify the participants' focus, we have just introduced a new grid in the Playroom setup. Now, the user needs to choose whether s/he wishes to focus on "statistical" qualities or prefers to indicate the mood or character of the sound. The 'statistical' qualities include acoustical properties and those relating to musical structure, such as texture, gesture, harmony, and rhythm.

New developments in the project include: more automated data collection; easier re-assignments of clips, newer database forms for clip information, explicit directions for various "games", clarification of terminology, more suggestions for axis labels, and an updated website. We are also refining the physical design of the Playroom in various ways, which contribute both to the attractiveness of the space and to the clarity of response from participants.

Plans for future developments include: multiple installations in various places internationally, connected by a virtual hub on the Internet; live video streaming of sessions; database subsets for in-depth studies; and a tighter integration with cognate projects. As we are still developing several aspects of the project, we are eager to receive feedback from acoustics specialists on the designs that could maximize its usefulness for them.

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[4] See website for images and more detail.