Overview of the

Interactive Multimedia Playroom

&

NESTAR:

a

N etwork of
E xploratory
S paces for
T emporal
A rts
R esearch

OLD! but still valid...

Rosemary & Harry Mountain

The Interactive Multimedia Playroom - Overview

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I. Overview & design

the Interactive Multimedia Playroom

centres around:

A testing platform *for investigating*

sound
movement
image
words

} *& their interactions*

as well as **time** & **temporal arts** *in general*

It is supported by **an international, multi-disciplinary team of experts**
for advice on **content,**
design, &
interpretation of data

It consists of :

an expandable / customizable media database

software / hardware for easy media playback

suggestions for terminology

sorting structures (grids, sorting racks, bins, trees, etc.)

and can also include:

libraries & **guides** to relevant resources - real & virtual

software / hardware (purpose-built and third-party) for easy manipulation of sound & image by non-specialists
Frelia, Acousmographe, Smart Board, etc.)

floor sound mats

interactive maps

"A.R. Rocking Corner"

It is suitable for:

psychological experiments
perception studies (sound, sound-image, time)
mood & emotion
music, film, & multimedia analysis
artistic collaboration
music composition (& performance)
cross-cultural studies
market analysis
team-building
teaching
museum exhibits

...and is exceptionally good for helping stimulate conversations...

consists of a set of networked environments designed to heighten the awareness of the role of sound in art and research contexts. These environments allow visitors to investigate sound and its latent and potential correlations with space, light, colour, image, and movement, and are designed to stimulate discourse about sound and its interactions with image & movement, especially within artistic contexts.

The Playroom centers around an installation named the Multimedia Thesaurus, which presents users with a framework and specific banks of sounds and images to be "sorted" according to their salient characteristics. Just as the traditional thesaurus does not define words, but instead groups them by association, the Multimedia Thesaurus does not aim to define sound characteristics, but instead encourages the exploration of the ways in which individuals and communities may interpret, describe, and identify similarities in sounds. Descriptions may be made with reference to other sounds, and/or to images, colours, movements, space, moods, and atmospheres. Unlike the traditional word-based thesaurus, the Multimedia Thesaurus allows users to build their own groupings and lists of associations, as well as drawing on the suggestions of previous and concurrent users. The involvement of experts from a variety of disciplines, including auditory perception, emotion & music, rhythmic analysis, music performance, composition, film, and dance helps ensure that we will be able to adequately define the issues involved and propose innovative ways to proceed with research into this very rich, increasingly relevant, and poorly-understood field. 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 Interactive Multimedia Playroom has been designed to stimulate discourse about sound in multimodal artworks. It attempts to investigate the factors that contribute to our perception of similarities and correspondences in the sonic and visual realms, and to examine the degree to which such perceptions may be shared among large or small groups of people. It also aims to focus attention on the potentials and shortcomings of various systems of classification of sounds.

Despite the prevalence of multimedia content in today's world - from film to flashy websites – there remains a paucity of critical language and analytical methods for investigating results of interacting sounds and images. Those working within artistic collaborations are often frustrated by the lack of common vocabulary for describing essential qualities of an existing or imagined sound.

We have been building a catalogue of very short sounds, and images (still and

moving) drawn from existing musical and visual repertoire of various styles and genres, supplemented by other sounds and images created especially for the project, either "from scratch" or based on a transformation of an existing sound.

The motivation for such a catalogue is the hypothesis that an isolation of short segments and their juxtaposition with a variety of images can provide a good framework for further exploration of our perception of multi-modal artwork.

Many of the salient features of musical excerpts can be sensed within a few seconds, whereas most previous studies, for example of film music, focus on much longer excerpts according to narrative "chunking". In addition, a systematic transformation of the various parameters of an existing sound (through timbre, tempo, register, mode, etc.) permit the creation of series of sounds where the degree of similarity can be studied.

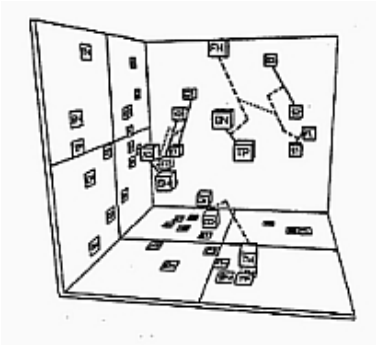
A principal objective of the project is to increase users' sensitivity to, and understanding of, the different characteristics of sounds and the effect of accompanying colour, shape, and movement. By isolating short fragments of sounds and video, and by associating the usually ephemeral sounds with hand-holdable objects that are infinitely rescannable, 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 engage, 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.

The IMP is being developed to facilitate easy access to relevant resources being developed by other research teams. Variable lighting, décor, acoustics, etc. will permit the creation of different atmospheres to illustrate how the physical space itself can impact reception. As we move towards several portable and several semi-permanent installations in different spaces (public, academic, private) in different parts of the world, we will also have an increasingly diverse population interacting with the project and contributing to our understanding.

Team members provide an international network of collective expertise in several disciplines. We are currently establishing a network of Playroom-type resource centres worldwide - see NESTAR (page 25) & Appendix A.

"The Crib in the Playroom" Oboro Gallery, April -May 2007

Installation design:



Basic structure: Physical clips 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, with source and copyright details, characteristics, and other useful data. A user (or "player") can scan a still image or video clip with a wireless scanner, 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, which together represent a 3-D grid, representing those used by psychologists in similarity ratings.

RULES OF PLAY (non-binding)

A.

1. **Pick a clip:** sound, image, or silent video
2. **Scan barcode** (with wireless scanner)
3. **Does it interest you?**

YES → Continue to B or C.

NO → Return to A.

B. **1. Scan clips of complementary* media** until you find one that seems to make a good combination (whether because it is realistic, artistic, amusing, thought-provoking, or whatever). (* if you are holding a sound, find an image or video clip; if you are holding image or video, find a sound)

C. **Choose one or more of the following:**

i. Think about it.

ii. Talk about it.

iii. Dance to it.

iv. Repeat A & B

v. Go to a sorting structure.

While at / in the sorting structure of your choice:

1. Look at existing labels (words, diagrams, pictures)
2. Accept existing suggestions,
   exchange for others,
   OR
   make new labels yourself.
3. Place the clip in a bin, on a rack, or on a chain in a grid, according to the labels.

Repeat ad lib.

SOUND CLIPS (basic edition) include a **diverse representation** of:

MUSIC *with examples of diversity in:*

- **cultures, ages, genres** (baroque, electroacoustics, folk, Carnatic, country, fusion, etc.)
- **timbres:** acoustic & mechanical instruments, computer-generated, vocal, nature, etc.
- **musical textures:** linear polyphony, multiple strata, heterophony, homophony; large ensembles, solos, etc.
- **other parameters:** melodic contours, modes, tempi, complexity, etc.
- **sound reproduction:** spatialization, recording quality, MIDI renderings, etc.

NON-MUSIC -

- **natural** (e.g. birds, mosquitoes, water, wind);
- **manmade** (cars, clocks, trains, factories)

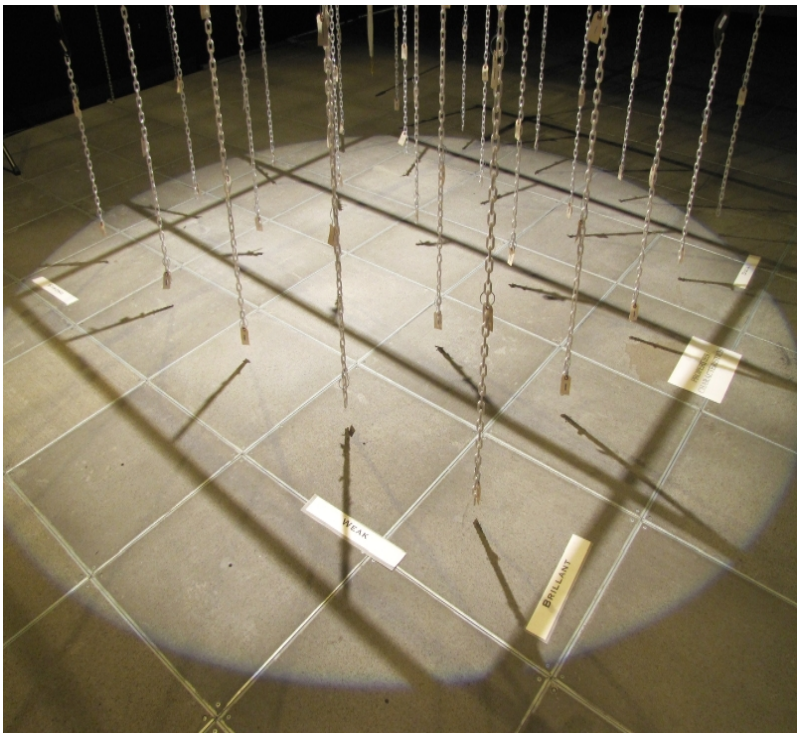
and including

- **signals / symbols** (sirens, bells);
- **associations / meanings** (typewriter, bus, gunshots, sighs)

VIDEO and **STILL CLIPS** likewise present a variety of realistic, abstracted, and abstract shapes and designs, including natural, manmade, urban, rural, artistic, mundane, complex, simple, etc.

N.B. Different sets of sound and image clips have been / are being developed for different contexts (e.g.: Quebec women composers; electroacoustics; musical textures; vocal styles & techniques).

GRID LABELS *(basic edition)* - include a variety of parameters. The labels on the trays, racks and grids can be chosen by the host or by the user. Suggestions for labels are drawn from psychology and musicology. They may refer to mood, genre, sonic parameters, visual associations, etc.



Examples:

- happy / sad;
- agitated / calm;
- natural / artificial;
- urban / rural;
- slow / fast;
- dark / bright;
- complex / simple;
- dense / sparse;
- musical / nonmusical;
- familiar / strange;
- smooth/ bristly;

etc.

CHARACTERISTICS

- fun to explore - to walk around with sounds in one's hand
- intriguing (& helpful) to visualize 3-D classification systemsentertaining to try to express perceptual associations - (a kind of 21st century charades or parlour [web?] game)
- fascinating to discover friends' & colleagues reactions & associations
- stimulates creative minds
- an "ice-breaker"
- completely configurable in terms of physical design structures and media content

II. The IMP as tool for ....

. . . artistic creation & collaboration

The Playroom is well suited to artistic creation for a variety of reasons:

- once image or sound files are assigned to barcodes, they are easily accessed and sorted in any way the artist(s) may find useful (much more easily than as files on a computer, for example);
- the sorting process, which can be a key step in the creative process but often subliminal, is brought into the open;
- the environment is especially conducive to collaboration, allowing artists to discover each other's preferences and descriptive terminology quickly and in an unprecedented way.

the challenge:

Expressing an artistic vision to others without the benefit of a common terminology or artistic references.

the IMP response:

By viewing and sorting numerous dips together, artists can discover many details of each others' associations, use of terminology, aesthetic preferences, modal sensitivity, etc. Sorting criteria labels and categories can be chosen according to the collaboration project's priorities. In addition, artists can provide their own media files to reflect their own vision. These files may be of their own work or from other sources which can help explain their ideas.

The IMP structure can be used to help conceptualize artistic ideas by allowing the artist to isolate fragments of sound and/or image and arrange them in different manners for experimentation: e.g. determining active-passive, tense-calm, dissonant-consonant, etc. This allows the work to be conceived of as the arrangement of small modules, which can contain high degrees of complexity but are then remembered as units. This aspect is enhanced by the recent software refinement which allows for variable playback speed and optional colour filters.

As tool for multimedia analysis / temporal arts research

The **IMP** was designed specifically for analysis of music and multimedia. The approach was articulated in the Armchair Researcher project (see Appendix C). Its design addresses concerns with traditional analysis methods, such as:

- **A need for more focus on rhythmic aspects of music:**

Most music analysis has focused on pitch-related aspects such as harmony, with rhythmic aspects considered only secondarily in the rarer melodic or motivic analysis. Many features of rhythmic analysis are hard to see in the notated score, even though often clear on listening. This prompted our focus on aural analysis (see below, and Mountain's doctoral dissertation, *An Investigation of Periodicity, 1993*).

- **A need for more sophisticated aural analysis**

Most music theorists study written (visual) scores, and therefore do not even consider music without a score, thereby ignoring most of the following:

- many forms and salient characteristics of jazz, folk, and rock music
- most non-Western music (Persian, Indian, African, Indonesian, Chinese, etc.);
- most electroacoustic & computer music

In addition, elements of performance expression are generally difficult to determine from the score, as they are learned by performers from their teachers, through oral tradition.

- **A need for analysis of music and sound design in multimedia works**

Music for film, dance, video, performance art, installation art, etc is rarely discussed, and when it is (as in Stravinsky, *Rite of Spring*) the non-musical aspects are rarely studied, as though they had no influence on the conception and reception of the work. This flaw seems even more pronounced when teaching courses in sound for non-musicians - within the context of communication, animation, dance, etc. How are we expecting to give intelligent comments, let alone marks, for cross-disciplinary work?

- **An interest in identifying mood, emotion, character**

Mood or emotion is often considered the prevalent characteristic of music by non-professionals (although Dr Mountain's personal motivation for composition is usually that of creating abstract sonic designs). Performance results are often improved by instructions to play with a certain mood in mind. We therefore find it unfortunate that mood and emotion are usually avoided in academic discussions about music. This seems to be a 20th-century phenomenon, perhaps stronger in North America; and probably tied to a general effort by academics to be more "scientific" and "objective." As psychologists have suggested that moods can be plotted onto a 2- or 3-D grid, it seemed that a structure like the IMP could encourage musicians to identify these characteristics - and surreptitiously encourage more discussion in the area.

- **A desire for more conversation with others prior to publishing analyses of music**

- Psychologists tend to ask several people for their opinions before offering conclusions, whereas music theorists often work in much more isolation -- on the grounds, presumably, that the required expertise is not easily found among colleagues. A basic premise of this project is that more conversation between people with different areas of expertise - theorists, artists, performers, non-musicians - could be stimulating and very possibly rewarding through the exchange of different perspectives.

The IMP advantages:

The IMP asks people to sort music clips by sound without reference to the score (aural analysis). Thus, it places all music and all listeners on a more equal footing.

The IMP allows for both casual and rigorous study of the relation between sound and image, by providing silent video clips which can be matched with any sound clip. At a basic level, the awareness this brings is striking. The interested researcher can devise studies with specific sounds and images to be paired, and can utilize labels for sorting which describe the nature of the interactions (we have drawn mainly on terms of Michel Chion but are also looking at other literature - see terminology reference sheets).

The IMP aims to keep abreast of work in many areas of music and multimedia analysis. We are linked through collaborators to important reference sites such as L Poissant's Encyclopedia of Media Arts and L. Landy's EARS (Electro-Acoustic Resource Site). We are also building a real and a virtual library (books, journal articles, CDs, etc.) with searchable database, annotated by our team members and collaborators.

As tool for psychology

Rosemary Mountain has been interested in issues of memory and cognition since childhood; her acquaintance with academic studies in psychology began during her

doctoral research when she became fascinated with the contributions to issues of perception of time and rhythm. However, she argues that several points hamper the usefulness of the psychologists' studies for music.

The issues:

Until very recently, most of the experiments in music psychology focussed on 19th century examples, probably a natural result of many psychologists having a typical music education in the form of private lessons on piano as teenagers before choosing their career. Dr. Mountain, from her perspective as composer and 20th century aficionado, became frustrated at the lack of examples and results which could transfer to 20th century works. In order to remedy this situation, she identified three strategies:

(i) Create a collection of excerpts from the 20th century repertoire which would provide rich material for psychological study;

(ii) Learn, and teach, interested colleagues more about psychologists' methods and terminology;

(iii) Establish a forum for discourse between musicians and psychologists.

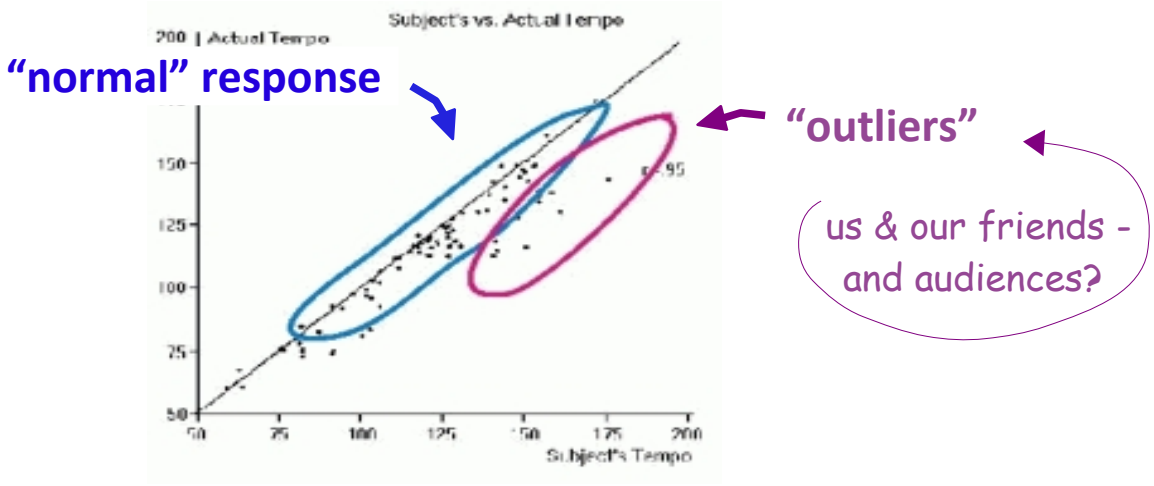
other key issues:

- Psychology experiments usually require months or years for proper preparation, testing, and analysis of results. This seems particularly unfortunate when people are waiting impatiently for the results , or when a flaw in the methodology or the question format is discovered after publication. The IMP is designed to address these points. The IMP can be used to conduct rigorous experiments. By providing an interesting environment, moving from place to place, and setting up "nodes" in different countries, the IMP creates an opportunity for psychologists to have a much more diverse array of participants But it is probably at its best as a pre-test environment, where participants are encouraged to give their opinions orally to the researcher. In this way, many ideas for test questions and formats can be tried without much preparation, thus allowing the researcher to have insight into the various possible interpretations and reactions before designing a more "rigorous" version of their experiment.

- Although psychologists interview or test a variety of subjects, it often seems that not only are the numbers too small to give a realistic reading, but that there is a tendency to ignore the fact that many groups of subjects are of the same age bracket (college) and restricted sociocultural groups (whether a town in Iowa, Ontario, or Yorkshire). Moreover, because many of the experiments are conducted in aesthetically unappealing labs, with long questionnaires, uncomfortable chairs, and often unmusical MIDI rendering of files, they would fail to represent entire segments of the population who do not voluntarily enter such environments.

- Compounding this problem, psychologists seem intent on discovering "normal" reactions to stimuli. However, answers to experimental probes often fall outside the main cluster of responses. This led us to imagine that the dots in the remote corners

of the graphs ("outliers") might represent our friends and possibly potential audiences for our own creative works. We wished to construct an environment where an unusual response would not be discarded as irrelevant.



Experiments under development using the IMP for psychology studies:

- Create databases of images and sounds of artwork from different eras of music and images of art and architecture (for example, Banquet Years, Futurists, Constructivists, Dadaists, Minimalists) and compare visitors' classifications for each data set. (Harry Mountain)

- Create a grid based on the diagram of the timbral similarity grid by Grey & Wessel (et al); categorize a database of tones produced by various musical instruments; invent instruments whose sound would fall into areas of the timbral similarity grid in which no existing instrument is categorized; in other words 'fill in the gaps'.

- Execute the multi-dimensional scaling study proposed by Dr. Annabel Cohen, which would test whether the IMP (as a 3-D installation) provides a similar mapping of the categorization of sound to that created by the usual (more abstract) psychophysical procedures that have been applied to questions of representing timbre (eg. Wessel, Carterette, Kendall, Sheppard, Krumhansl, Iverson).

- Experiments designed to enrich our vocabulary for the description of musical texture and musical gesture.

- Experiments designed to help us determine the extent to which the following are individual, group, cultural, or universal - and to what extent they can be modified:

- Experiments about mood / emotion associations

- Experiments on perception of sonic characteristics (such as degree of motion or complexity)
- Experiments determining appropriateness of specific sound-image pairings

Consultants for perception & cognition issues:

Dr. Annabel Cohen (UPEI, Charlottetown: psychology of film music)
Dr. Rolf Inge Godøy (Univ. of Oslo: analysis, composition) musical imagery, gesture
Dr. Stephen McAdams (McGill CRC: Director of CIRMMT)

As tool for information retrieval

Although the IMP project was not initially conceived of with any specific reference to music information retrieval (MIR) research, it does investigate several aspects that overlap with that field. The aim of our project was initially to further our understanding about how people think about music and sonic art, and to encourage the refinement of appropriate vocabulary and methods for describing music. However, it also offers insight into issues of classification in general. Therefore, the strategies which we are designing to stimulate discourse on these issues, as well as the actual responses we are beginning to collect, may offer unusual perspectives to the questions posed by MIR.

Information classification and retrieval in the field of music is pertinent to: internet music searches; cataloguing in libraries, CD stores, etc; storing and retrieving media files (*for ex.* when working on a creative project). Within these contexts, a better understanding of descriptors, sound/image associations, and recognition of salient characteristics of a musical excerpt will help to avoid situations like this:

leaves.wav
leaves1.wav
leaves1a.wav
leaves1a-low.wav \
leaves la-low-muffled.wav
leaves la-low-muffled-16bit.wav

It can also suggest and test new approaches to cataloguing and accessing very different types of data. One of the interesting aspects of the Interactive Multimedia Playroom is that any participant can suggest a label, and then we can experiment to see how useful it seems over the range of musical and sonic examples. Clearly, some are not appropriate for the grid format (which suggests a continuum between poles on each axis): genre and colour being two good examples. We have been grouping the other (non-genre) labels loosely into two groups: sonic characteristics, and qualities of association or character (including mood). For sonic characteristics we have been using categories such as melody, texture, gesture, chordal, rhythmic, etc. These can be used in a preliminary classification, to refer to what seems the most striking characteristic of the sound or its best description; some of them can also be used as the basis for axis labels to encourage sorting according to the

nature of the characteristic: “sparse / dense” or “less / more grainy” for texture; “smooth / angular” or “simple / complex” for melody, “regular / irregular” for rhythm, etc. Of course, with the amount of borrowed vocabulary in music, these descriptions quickly become associative too. This is not seen as a problem, but rather as an interesting way to probe the ideas of researchers such as R.I.Godøy – one of our collaborators – who suggest that our appreciation of aural information is often linked to some form of visual imagery - at subliminal levels if not overtly..

As tool for pedagogy

The IMP is proving to be useful in many different pedagogical contexts and depths, from the level of elementary school to graduate studies, and from activating a general sensitivity to sound to specific study of details. The IMP is naturally an excellent resource for newer curricula where students are studying sound and sound/image relations from either a creative or analytical perspective.

Dr. Mountain's attention to pedagogy began in her high-chool years, when she read about and led discussions on different approaches to education, models of learning environments, and psychological factors. Many years later, while completing her PhD., she spent 2 years teaching high school in the UK, accompanied by intensive workshops in teaching, where she became acquainted with the thoughtful preparation of the Music sections of the new National Curriculum. While in Portugal, she helped develop the Licentiate in Music Training, ensuring that pedagogical reflection formed an important component of the curriculum; she also taught music courses in the Education Department. These all alerted her to various aspects of pedagogy which have influenced the design of the Playroom: useful concepts, need for terminology, and the effectiveness of active participation (physical and mental) on learning.

During many years of teaching music composition, music for non-music majors, sound for animation, 20th century music history, and analysis, she began to gather short excerpts from various musical works to illustrate my usage of terms as well as the music elements and concepts. In particular, she became interested in exploring usage of the terms 'texture' and 'gesture'. The terms, though used commonly by composers and music theorists, are not yet clearly defined in textbooks; a certain amount of discrepancy exists among scholars, and performers' usage. We are therefore designing experiments to focus on finding appropriate descriptors for different types of gesture and texture. This investigation can be stimulated by comparing sonic textures with images of visual texture (and even swatches of fabric and other material), and comparing sonic gestures with gestural drawings and custom-made videos of dancers and animations.

As machine for fostering multicultural exchange

The Mountain's interest in diverse cultural traditions and geographic landscapes motivated the diversity of media clips used in the "basic set" - a diversity that is clearly central to the project's essence. The effect of presenting random media from such an assortment of settings is clearly visible in the expressions of young children in Montreal's multicultural schools, where faces will light up with delight on hearing a sound or musical excerpt clearly familiar from previous acquaintance within a positive context. This is also a key element in the project being developed between Aveiro, Dallas, and Montreal, whereby school children will create or select media clips representative of their own environment, to be uploaded and shared with the others. Adults can similarly benefit from the potency of short media clips to express and share less tangible aspects of their heritage.

As tool for market analysis

The IMP project was not initially conceived of with any specific reference to market analysis. However, it was designed to facilitate rigorous psychological experiments and to identify personal preferences of music, image, and their combinations. In addition, it has prompted speculation by psychologist Dr. Norman Segalowitz (Concordia) that we may be able to postulate new ways of understanding and testing for potential new groupings according to "aesthetic profiles". Latest developments such as an online database are greatly improving the ease of incorporating new content, and an expanding team of experts in a variety of disciplines can help industry partners choose or design appropriate content. In addition, the current development of a sensored system and virtual version (which will act as the interface between nodes but also can provide a stand-alone application) will greatly facilitate the conducting of survey to widely diverse populations, as nodes can be set up with minimal investment internationally. Given the playful nature of the tool, people enjoy thinking about and expressing their preferences; the (optional) use of axis and other sorting labels also enables a fine-tuning of interpreting and evaluating these preferences.

As tool for translation studies

It has been brought to our attention by members of the Dallas and Aveiro nodes, that the Playroom would lend itself easily to translation studies, both for those learning another language (whether children or adults) or by researchers (such as those working on dialect differences). It involves a simple extension of the initial idea: after searching for an appropriate position for a media clip according to given labels, one can then test the appropriateness of the translation of that label to tease out nuances of context and cultural shading, The labels currently exist in English, French, Portuguese, and German.

As tool for study of sonic parameters:

The Playroom's design enables easy comparison of sonic attributes of any array of examples. The combination of "portable" sounds, classification frameworks, and customizable terminology makes it particularly useful for research into areas which are primarily sonic: language, birdsong, acoustics, etc. Through the use of carefully-chosen (or specially-created) content, questions can be asked and answers given through the use of examples, despite the lack of sophisticated common vocabulary. Furthermore, terminology already in existence or suggested in the course of experimentation can be easily taught, tested, and refined.

As tool for improving awareness of acoustic ecology

For similar reasons to the above, soundscape studies and issues of acoustic ecology are also easily grasped by exploring in the Playroom. Although sonic examples are usually restricted to 10-12" in length, it is very simple to incorporate excerpts of much longer duration, enabling appreciation of different sonic environments. This is particularly effective in a large darkened space (such as a Black Box) where recordings of different indoor and outdoor spaces can more easily evoke the environment which they represent.

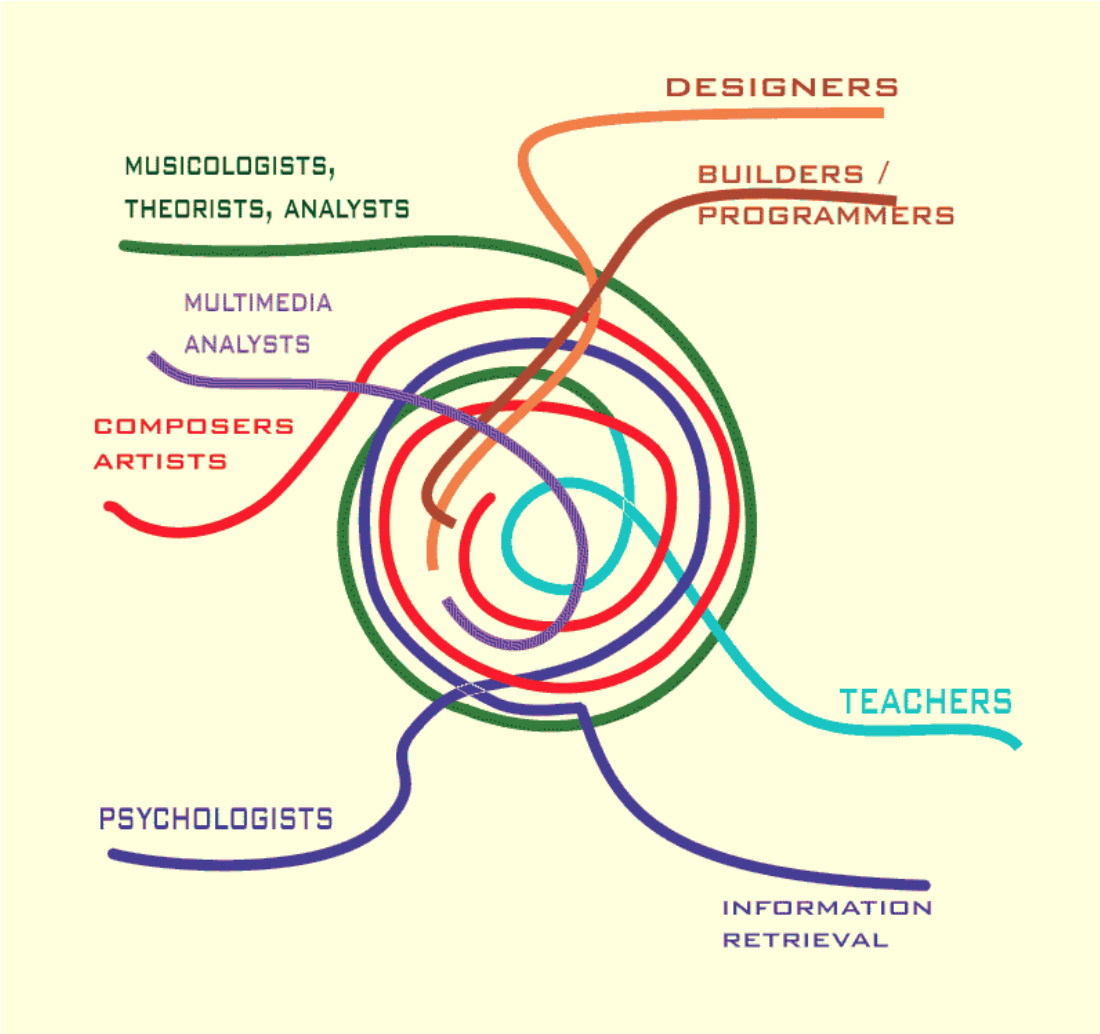
As machine for performance:

The artist can *perform* a work by arranging the clips in some particular order (such as in the 3-D cube) and then scanning them in succession, incorporating choreography as desired to design the movement from on to the next. Musicians can improvise sounds to fit with images; dancers and artists can create movements or images to fit with sound clips. (These sounds, movements, and images can be recorded for future incorporation into the media bank).

As tool for networking & team-building

The nature of the Playroom's design encourages lively, non-confrontational communication, through conversation stimulated and enhanced by non-verbal content. In addition, the tool can be tailored to a superb environment for brainstorming, team-building, etc. - due to its potential for incorporating media clips relevant to any given theme, issue, or aesthetics, and to the variety of ways in which people can interact with them.

As increasing numbers of people from different disciplines visit the Playroom and employ it for their own research or dissemination, the more that research will be expressed in ways that other users can follow, due to the commonality of the basic framework. Also, the development of several nodes or replicas of the Playroom in different world regions and contexts will facilitate trans-disciplinary testing, as well as an improved dissemination of results.



As a *bridge between verbal & non-verbal communication*

Watching participants engage with the installation has made us aware that people begin to use the media content as away of explaining concepts and moods that may be difficult to articulate. The choice of 10-12 seconds for the "average" clip length, chosen for reasons relating to the (presumed) limits of short-term memory and the realization that these very short segments contain enough information to provide a rich example for reflection, without significant changes of mode or character which could add further complexity and complicate analysis of the results. The unexpected benefit is that people can interpolate a media clips as a substitute for a phrase in their sentences, thus creating a type of "augmented conversation". A further benefit is that those who have difficulty with verbal communication can express themselves more easily with such ready access to media; this has been apparent in our work with children with mental disabilities in a Montreal school. Of course, in the original conception of the project, we proposed that we *all* have difficulty with verbal articulation of descibing sound and image, so this more recent discovery is simply a matter of scale and context.

As *machine for mental calisthenics*

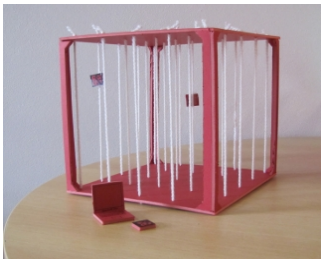
Many of us enjoy spending hours in the Playroom; it is a fascinating environment and tends to stimulate conversations: not only about perception and choice of descriptive terms, but also about personal experiences, upbringing, cultural influences, etc. These can emerge either while trying to explain one's particular perspective and influences, or may be prompted simply by recognition of a special element of the sound or image. Team members have realized that these characteristics could make it an ideal installation in community centres, seniors homes, rehabilitation centres, etc. where clients may benefit from the mental exercise it involves, in a social and non-confrontational environment.

III. *Museum exhibits:*

Prof. Lisbeth Goodman of SmartLab in London was the first to alert us to the potential of

the Playroom for a museum exhibit, on a visit to Hexagram in Montreal. [1] That potential was confirmed by various museum curators in Portugal, Texas (Dallas Museum of Art), and Montréal (Centre de Sciences de Vieux-Port) . Our colleagues in Portugal at the Universidade de Aveiro have followed up on this suggestion to design a version suited for children, to be installed at the Fábrica Live ScienceMuseum, Aveiro, Portugal, in summer 2012.

IMP-CUBED: The first offspring of the Interactive Multimedia Playroom, IMP3 ('IMP-cubed') was presented in Aveiro, Portugal in the fall of 2009. It was built mainly by Inês Rocha as part of her thesis[2] for a Masters in Multimedia at the University of Aveiro, under the supervision of IMP collaborators Dr. Ana Veloso and Dr. Oscar Mealha. Ms. Rocha designed a new interface specially adapted for children (ages 7 - 11), and also developed some games to be played in the structure.[3]



IV. NESTAR: *A Network of Exploratory Spaces for Temporal Arts Research*

We are aiming to establish a network of resource centres to promote research into

[1] It is interesting to note that they inaugurated their own space as a "Playroom" a few months after that meeting. The name of the Playroom was inspired by Oscar Mealha in Aveiro in the late 1990's, when we were discussing the importance of brainstorming for research.

[2] Estratégia de jogo com interface tangível para uma instalação multimédia [Game strategy with tangible interface for a multimedia installation]

[3] One of the games, "Five in a Line", won an honourable mention at the international Videogames conference held at the University of Aveiro in Nov. 2009.

temporal arts, building on and refining the Playroom structure and concerns. [4]

The goals are:

- to enhance the physical and technological aspects of the Playroom;
- to expand into a network of full resource centres;
- to develop specifically relevant content;
- to increase the exposure & entice more participants to explore and participate in experiments;
- to explore the structures and strategies as potential for artistic creation & collaboration;
- to analyze findings;
- to begin pooling and disseminating results;
- to expand the team to include more musicians, artists, and researchers;
- to enhance communication among team members and interested guests, to facilitate easy exchange of ideas and content, in a combination of virtual and in-person communication.

[4]To this end, we havebeen applying for funding from a variety of sources. An *International Opportunities Fund* grant from the Canadian government agency Social Sciences & Humanities Research Coucil was received in 2010.

A Network of Exploratory Spaces for Temporal Arts Research (NESTAR)

Temporal arts refers to all art that depends on time to be wholly manifest – thus including film, television, video, performance art, music, theatre, and dance. Despite the ubiquitous presence of music and media in today's world, there has been little systematic study of the relationship of music and sound (ingredients of most temporal artforms) with movement and other visual information, nor of their impact in terms of our perception and reception of specific content. It is our belief that all temporal artforms may share some important aspects which can be revealed by similar analytical tools and methodologies. Therefore, we aim to draw attention to them as a distinct group, and to design appropriate environments, structures, strategies, methodologies – and even questions – which will advance the study of temporal arts in general. The eventual goal is to establish a centre where researchers can explore, experiment, and exchange ideas about sound, image, movement, and time in art – with reference to issues of language, perception, communication, and learning. The team will have a strong physical presence in Montreal, but will also enter into dialogue with collaborators internationally via a virtual space, enabling real-time interaction with other physical nodes of the same project.

(from the [*unsuccessful*] *FQRSC application)*

NESTAR centres would house the following:

- **the Interactive Multimedia Playroom**
  (full "resource centre" + virtual version + links to other nodes)
- **lecture series / performance series / workshops / visiting artists**
- **publications**
- **experiments & studies** (current & proposed):
  - art & music history
  - music analysis
  - mood association– sound / image / movement / colour
  - gesture
  - musical texture
- **lecture / meeting series** (informal & formal):
  - topics: time / temporal art
  - sound–image– movement interaction
  - classification & retrieval
  - networked communities
  - cognitive studies (auditory / temporal / multimedia perception)
  - individual research projects
  - other cognate areas
- **publications:**
  - newsletter – quarterly (becoming monthly?)
  - newsflash ...
  - website (with intranet)

COLLABORATORS:

schools:	Montreal	*Fais ta Valise* project, coordinator M Mickaël Lafontaine
		École Saint–Pierre Apôtre, coordinator Mme. Doris Ouellet
	Dallas –	Dallas International School, liaison Dr. Frank Dufour
museums:	Aveiro, Port –	Fábrica Ciencia Viva, coordinator: Drs. A Veloso / P. Trincão
	Dallas	(Museum of Art, Dallas – to be confirmed)
art galleries––	Montreal	Oboro Gallery – spring 2007
industry –	Smart Technologies (donation of SmartBoard)	

We will campaign for support from local and international communities, in the form of:

collaboration

funds

space

library & media content

translation

legal services

publicity

... and any other gestures of encouragement...

Team members who have agreed to support NESTAR:

Dr. Rosemary Mountain (founder)	Dr. Sudhir Mudur
Harry Mountain (founder)	Cilia Sawadogo
Diego Agudelo-Gallo	Dr. Ana Veloso
Sandeep Bhagwati	Dr. Marcelo Wanderley
Dr. José Luis Carles	Emily Pelstring
Dr. Annabel Cohen	Andre Arnold
Dr. Ricardo Dal Farra	Ian Hattwick
Dr. Frank Dufour	Julian & Max Stein
Dr. Rolf Inge Godøy	Solmaz Shakerifard
Dr. Oscar Mealha	Nimalan Yoganathan

V. Future developments & long-term goals:

Future developments: virtual version - sensored version - network of nodes

The Interactive Multimedia Playroom has been in existence for several years, and has generated interest in many fields and countries. Partners in Portugal, England, New Zealand, and the US are interested in developing different "nodes" of the Playroom, and establishing contact between nodes through a system of sensors and a virtual, web-based version of the three dimensional grid, currently represented by plastic chains.

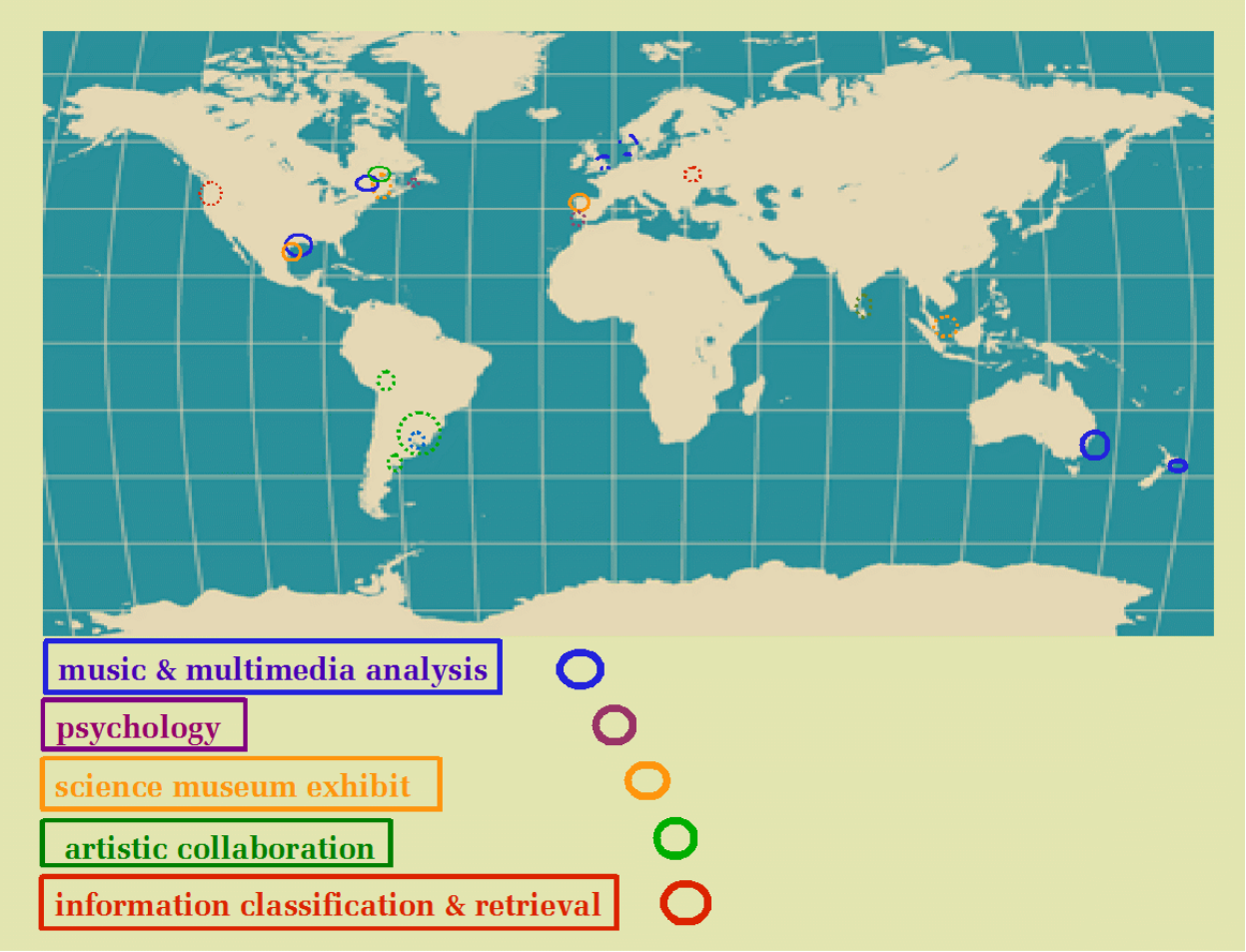
The creation of this Virtual Playroom will maximize its appeal for potential collaborators in different regions. Users will be able to upload and share their own ideas instantly and from remote countries. Therefore, collaborators would not be limited by geographic location. The creation of the Virtual Playroom will be an important step toward the Playroom's development into a networked community. Virtual Playroom will be linked to physical installations at the various international nodes, perhaps via an RFID sensor system. Sensors will be inserted into key points of the physical setup to permit the instant entry of a clip's placement into a computer. A link will be established between the local computer in our center and the web-based virtual Playroom to permit remote viewing of a given clip's placement through LED lights embedded in the grid.

We already have graduate students capable of serving as technical consultants for this work, both in Montreal and in Aveiro, Portugal. Preliminary budgets estimate that the cost of building the physical grids with a sensor system and embedded LEDs will range between $6,000 and $9,000 (CAD).

The essential concepts and design of the Interactive Multimedia Playroom are being continually reviewed and updated. The project design improves itself naturally as those of us working on it further our collective understanding of the issues and factors involved. Meanwhile, the nature of the project is proving successful in encouraging participants, whether team members or visitors, to spend extensive time reflecting on the latent associations we have regarding sound and image, and ways to articulate them. It was considered essential to have such diversity of disciplines represented on the team and through selection of installation locales, to ensure that we are not too hasty to jump to any conclusions about how "people" listen, articulate, associate, and communicate.

We are not as interested in the "average" or majority response as we are in our own and our colleagues' responses to music and image. I suggest that this priority, along with the emphasis on collaborative discussion about categorization, may provide insights to research being undertaken by members of the different disciplinary and interdisciplinary communities. In addition, the design of the Playroom as a "flexible framework" can easily function as an adaptable testing-ground for work-in-progress.

a growing network....



nodes under construction:

Montreal,Canada (i) music & multimedia analysis (ii) school-disabled children)

Dallas, USA (school & museum - children / university - multimedia)

Aveiro, Portugal (museum exhibit - children)

Madrid, Spain (music - architecture)

Long-term goals

a. in the academic / scientific realm:

- develop / refine a vocabulary for critical discourse of sound in multimedia (and, by extension, temporal arts in general);

- develop a nucleus of researchers with enhanced awareness of sound and its potential in communicating specific ideas, moods, and images.

- enable a significant pooling of research tools, data, and results by developing a shared framework & resources

- develop curricular tools & strategies for multimedia creation

- contribute to a better comprehension of sound & multimedia perception / reception

- contribute to a better comprehension of classification / indexing/ data mining

b. in the artistic realm:

- develop optimum environments for the composer / sound artist / multimedia artist to explore possible configurations - a kind of 3-D sketchpad

- provide an elegant means for enhancing collaboration between artists

c. in the commercial / business realm:

- develop interactive museum exhibits

- develop pedagogical materials for education

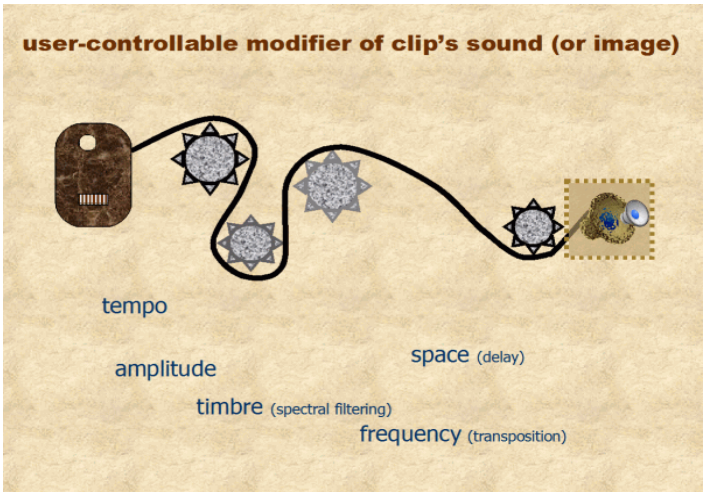
- develop a team-building system

- develop user-adaptable software for organizing (media) files

Other dreams:

As the network expands and centres proliferate, we hope that different places will be able to house the resource centre in very different environments. This will allow us to study the impact of those environments on the reactions to the media. Additionally, a multi-level space with various "nooks and crannies" may permit a much finer classification system. In the interim, virtual spaces of considerable complexity may be designed (or appropriated). We also believe that it will facilitate development of a new type of file-organizing / navigation software to replace the standard tree structure with a more organic virtual 3D model.

We are also interested in developing playful mechanisms for altering sounds and images, to allow intuitive modification by non-specialists through analog physical controllers (e.g. an exercise bike which controls the speed of an audio &/or video clip).



VI. Summary

Characteristics of time & sound are rarely discussed in our ocular-centric society, due in part to a lack of a suitable vocabulary, yet they exert a profound influence on our perception of many artworks. This project aims to help develop & refine a shared vocabulary and establish some common references for discussion and analysis, as well as to enhance critical reflection on time-based arts. It is designed to improve communication among artists and associates generally, and to heighten awareness of issues relating to performance and sound that are often overlooked by people outside those areas.

As more users participate in the project, certain words, sounds, and images will be found particularly well-suited to expressing fundamental categories and correlations, and will thus become naturally integrated into a working vocabulary for description and analysis. Preliminary stages of the project include frequent meetings of artists and musicians to discuss specific artworks by members which incorporate sound and some other element. These discussions are being documented by sound and video for future reference. The idea is that through critical dialogue, we will be able to establish a preferred set of terms and definitions for description of such artworks. This will in turn lead to an organic growth and refinement of an appropriate vocabulary, as well as an increased sensitivity to sonic elements of an artwork. Recommendations for "axis labels" will also be drawn from these discussions.

The project is gathering a core of highly-qualified researchers from areas of dance, film, animation, music, theatre, and architecture, as well as in areas of perception & cognition and media technology. In addition, international consultants and the creation of a website will allow the project to be available to interested players internationally.

The project is expected to **accelerate the progress of understanding our perception of sound and music** in multimedia contexts by directing the attention of the "users" to the way in which they think about music, as well as by exploring the commonality of responses. The research tool itself encourages multiple classification systems rather than searching for a single "best" solution, allows for continual refinement of responses, and welcomes collaborative investigation. It also illustrates the role of aesthetic design of a laboratory and its apparatus, and challenges the notion that playfulness is antithetical to purposeful research.

Appendix A: Collaborators

Probably the most valuable aspect of the project is the diverse expertise of those who have volunteered to participate in the project development, whether as consultants or experimenters. Dr. Annabel Cohen and Dr. Stephen McAdams have vast knowledge of psychological studies (in the areas of film music and auditory perception respectively); Dr. Louise Poissant and Dr. Leigh Landy are both leaders of projects which aim to define terminology (Encyclopédie des Arts Médiatiques and EARS respectively); the other team members are all active and noted artists / researchers in design, dance, sculpture, film, and music.

Collaborators, consultants, hosts:

Dr. Rosemary Mountain (founder)
Harry Mountain (founder)
Dr. Ana Veloso
Dr. Frank Dufour
Dr. Ricardo Dal Farra
Dr. Rolf Inge Godøy
Dr. Sudhir Mudur
Dr. Annabel Cohen
Dr. Louise Poissant
Dr. Marcelo Wanderley
Dr. José Luis Carles
Cristina Palmese
Dr. Luis António Gutierrez
Dr. Erin Manning
Sandeep Bhagwati
Dr. Stephen McAdams
Dr. Oscar Mealha
Doris Ouellet
Mickaël Lafontaine
John Coulter
Emily Pelstring

OUT OF DATE !

Research Assistants (~~current/~~recent)**:**

Julian Stein (BFA Electroacoustics--Concordia)
Maxwell Stein (BFA Electroacoustics--Concordia)
Ian Hattwick (PhD Music Tech-McGill)
Solmaz Shakerifard (MEd -Music - McGill)
Randolph Jordan (PhD Hum--Concordia)
André Arnold (PhD Design--Concordia)
Ameesha Joshi (MFA Studio Arts: Film Production--Concordia)
Nimalan Yoganathan (BFA Electroacoustics--Concordia)

Anyone wishing to joind the team is encouraged to write the team leaders at:
playroom@inbox.com

Appendix B: presentations & publications - Past & Upcoming

Since its inception, the Interactive Multimedia Playroom has been presented both conceptually and in physical installations in a variety of contexts:

Sept. 2003	"Flexible Frameworks: The Multimedia Thesaurus" presented at the V triennial *ESCOM* conference (*European Society for Cognitive Studies in Music*), Hannover, Germany, – see *Proceedings of the 5th triennial conference of ESCOM.*
Sept. 2005	"MMT Travel Kit" - demonstration presented at the *International Computer Music Conference*, Barcelona
Oct. 2005	"Tool/Game/Environment: The Interactive Multimedia Thesaurus & Playroom" *EMS-05* (*Electroacoustics Music Studies*) conference, Montreal, as both paper presentation and installation.
2005-2006	Various presentations of installation to Hexagram guests and sponsors, including municipal, regional, and federal government agencies and ministries, Cirque du Soleil and Daniel Langlois R&D teams, London Science Museum, etc.
May 2006	Installation of the IMP at UQAM – Pavillon des Sciences in the context of Montreal's first annual *24 Heures de Science*.
June 2006	"Report on the Interactive Multimedia Playroom and Hexagram" - *Deca In Festa* –Department of Communication and Art, University of Aveiro, Portugal – also to the Director of the Fabrica Centro de Ciência Viva Science Museum of Aveiro.
Aug. 2006	"Report on the Interactive Multimedia Playroom" - University of Prince Edward Island, Dept. of Psychology,– to students and professors from various disciplines.
Oct. 2006	"Name that mood! Describe that tune! Invitation to the IMP" – poster and demo at *ISMIR [International Society for Music Information Retrieval]*, Victoria, BC, Canada
Apr-May, 2007	first major public installation of the IMP - "The Crib in the Play*room*" – Oboro Gallery, Montreal, Canada.
July 2007	installation of the IMP presented as special event at the *Society for Music Perception & Cognition* conference, Montreal.
Oct. 2007	"Playful Tools, Serious Questions" paper presentation and full installation of the IMP for the conference of the *Canadian Acoustical Association*, Montreal.

March 2008	presentation of the IMP as part of a symposium-concert entitled: "Music of all ages... and genders" with Nicole Carignan (UQAM), Mireille Gagné (Canadian Music Centre) and France Leblanc (MAESTRA) at Univ. de Québec à Montréal.
June 2008	presentation of a paper entitled "Sorting Sounds: testing tools & strategies" at the *EMS*-08 (*Electroacoustic Music Studies*) conference, Paris. GRM/ Sorbonne - reporting on usage of the IMP for classification of electroacoustic music.
July 2008	presentation of the Interactive Multimedia Playroom as part of a symposium-concert entitled: "Music of all ages... and genders" with Nicole Carignan (University of Quebec at Montreal), Mireille Gagné (Canadian Music Centre – Quebec) and France Leblanc (MAESTRA) at the *ISME* conference (*International Society for Music Education*), Bologna, Italy
May 2009	installation of the Interactive Multimedia Playroom with three grids, each dedicated to a separate area (sound-image relationships, sonic or visual parameters, mood or association) and separate areas clarified (with colour coding and pamhplets) for different disciplines. Mainly by invitation, the installation allowed us to present the project to various potential partners including the Centre de Sciences (Vieux-Port); musicians from prominent local ensembles I Musici and La Nef; and assorted researchers.
January 2010	installation of the *Interactive Multimedia Playroom* to host four groups of school children from Montreal schools, as part of the *Fais ta Valise* programme.
May 2010	presentation of the *Interactive Multimedia Playroom* at the Hexagram Black Box, Concordia University - as a featured presentation of Concordia research during the 2010 Congress of the Humanities and Social Sciences.
March 2011	long-term installation of the IMP at the school Saint-Pierre-Apôtre, Montreal
May 2011	presentation of the *Interactive Multimedia Playroom* to potential partners at the Dallas Museum of Art and the Dallas International School, Texas, USA
July 2011	installation of the IMP at the Avanca | Cinema conference / festival, Portugal
July 2012	installation of the IMP at the Avanca | Cinema conference / festival, Portugal

upcoming

winter 2012- 13	installation of the IMP as pilot year-long exhibit in the Fábrica Ciência Viva science museum, Aveiro, Portugal
March 2013	installation of the IMP at the Univ. Autonoma (Music) and Technical Univ (Architecture), Madrid, Spain

Appendix C: Related projects

The *Interactive Multimedia Playroom* grew naturally out of Rosemary Mountain's research into new strategies for music & multimedia analysis and how to choose the most appropriate approach for the specific work and the context of the investigation.

The *Armchair Researcher* project, articulated in 1998-99, presented her initial reflections on strategies and suggestions of topics to be investigated. It included a set of "SAQs" [seldom-asked questions] to prompt reflection. The questionnaire & more information, can be found on the website:

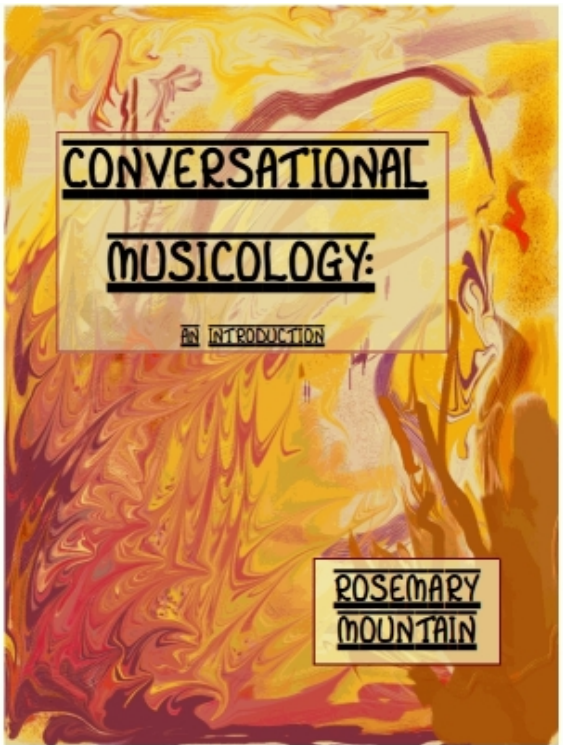
http://www.armchair-researcher.com

Tool Kit for Music Analysis -

This project is intended to present and evaluate the many different ways of looking at and listening to music. It aims to clarify the diversity of approaches to and objectives of analysis, and recommends strategies for choosing the most appropriate tools for the intended purpose. It is designed to be presented in a book / website / DVD-Rom format, allowing for direct access to online articles and websites, and permitting a multi-dimensional presentation of numerous examples, especially those which exemplify the less familiar forms of analysis. It would be complemented by an annotated bibliography & resource directory, pointing the investigator to relevant books, articles, scores, recordings, webpages, journals, and organizations for further clarification and support. As an essential part of the work was originally developed for use in auditive analysis, the Tool Kit can also serve as a guide to the listener. A preliminary version, which will serve as a call for participation for the fuller version, is being developed as *A Template for a Tool Kit*.

Conversational Musicology -

This project is designed to allow the author to proceed with the material of the *Tool Kit* without having to wait until she has amassed all the expertise needed for that project (quite possibly beyond the scope of a lifetime). Rosemary coined the term “Conversational Musicology” to suggest an approach she believes is urgently needed in the fields of music and multimodal artworks (which usually involve sound, and almost always involve time). In fact, she argues, it's an approach we need in many fields where the degree of specialization has led to an increasing lack of communication. It can be thought of as loosely modeled, at the conceptual level, on what we call "Conversational Spanish" or "Conversational German": a popular methodology for learning a language which both motivates and is motivated by a desire to jump into a foreign culture and start navigating in it, sharing information and ideas with its people. It begins with some basic vocabulary, cursory knowledge of syntax, and some stock idiomatic phrases.



In such an analogy, *Conversational Musicology* extends the 'basic vocabulary' element to include all kinds of terminology - as well as concepts and repertoire - with the various shades of meaning as manifest in different 'camps': historian, theorist, composer, performer, listener, sound engineer, critic,teacher - further separated by genre or type (electroacoustics, jazz, serial music, Brahms). The syntax could then be understood as the methodologies used (socio-cultural, pitch-based, semiotic, etc.) and also the style of presentation of research findings (formal high-brow academic tone versus an online forum,or a conversation during rehearsal). The 'stock idiomatic phrases' could be interpreted as the most quoted bibliography and biases of each camp.

One of the major problems with multidisciplinary investigation is that so often the researcher is confronted with specialized terminology and reference to unfamiliar scholars and bibliography that considerable time is required just to discover whether the ideas being discussed are relevant to one's own research or not. We have noticed this not only between music and auditory perception studies, music and other performing arts, music and cultural studies, etc. but also between sub-disciplines within music. In particular, Rosemary was disheartened to realize that significant research emerging from the study of electroacoustic music is scarcely intelligible to many musicologists who are highly competent in their appreciation of pre-20th-century Western music; the situation is similar with relevant cognitive science research, which can be inscrutable to musicians and

therefore does not encourage feedback from them. The author's aim is to encourage colleagues to help select or create auditory examples and/or clear short texts to explain terms and concepts of such things as pitch, gesture, spectromorphology, and consonance so that anyone interested - whether musicians or other artists or researchers - can begin to understand what is meant, without being obliged to take a course or two. In the field of artistic collaboration, it is also essential to clarify the different usages of words like texture and gesture that may have clear but somewhat incompatible meanings in dance, visual arts, and music.

This is the motivation behind the proposal for a series of pamphlets which will introduce the 'lay reader' to concepts in music in terms that welcome the non-specialist while maintaining the integrity of the area for the specialist. This approach has a particular attraction of allowing publication of the author's current reflections developed over the years in various areas (rhythm, time, texture, gesture, auditory analysis, music in multimedia contexts, etc.) without undue concern with their order of publication, or the comprehensiveness of the collection as a whole; ideally, this work will provide a clear enough vision of the project to encourage others to do the same: contribute to the series or create their own. This project is envisioned as establishing a conceptual framework which could make information retrieval easier. (By easier in the sense not only more efficient but more natural, in a cognitive type of way).

This project is another stage in the Armchair Researcher project, initiated a decade ago, and is connected with the Toolkit for Music Analysis project. It may serve as a guide to the Tool Kit - or most likely, render that project obsolete. This project is also intimately connected, especially in its aims, with the IMP and NESTAR.

Chapters / pamphlets that are under construction include personal reflections and sketches, along with recommended readings and listenings, on the following topics:

- time
- mapping the field [of musicology / analysis]
- texture
- gesture
- consonance / dissonance (harmonic, rhythmic, timbral)
- tuning/ temperament
- music & multimedia

Appendix D: Supporters

The Interactive Multimedia Playroom project has been / is being supported by funding and other contributions from:

- Social Sciences & Humanities Research Council (International Opportunities Fund)
- Hexagram Institute for Research / Creation in Media Arts & Technologies
- Centre Interuniversitaire des Arts Médiatiques
- Concordia University Office of Research
- University of Aveiro Dept. of Communication & Art
- Smart Technologies

We are urgently in need of space, and funds to pay for realization of this project. Any donations in the form of time, space, money, information, expertise, contacts, or letters of support would be most gratefully received and acknowledged.

Appendix E: contact

Dr. Rosemary Mountain & Harry Mountain – playroom@inbox.com

websites:

http://www.armchair-researcher.com/IMP/IMPweb/index.html

http://www.IMP-NESTAR.com *(under development)*