

VOCABULARY OF SPACE **IN ELECTROACOUSTIC MUSICS :** **PRESENTATION, PROBLEMS** **AND** **TAXONOMY OF SPACE**

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Plan

The GETEME

Presentation, Objectives, Projects

The « Vocabulary of space »

Presentation, Objectives, Working method, Documentary sources, Problems

The taxonomy of space

Categories, Classification, Examples of use

The GETEME



Groupe
d'**É**tude sur
l'**E**space dans les
Musiques **É**lectroacoustiques

Working group on space in electroacoustic
musics

<http://geteme.free.fr>



Presentation



Fonctionnement



Les«Mots d'Espace»



Exemples sonores

- ◆ founded at the end of 2003 by Jean-Marc Duchenne, Bertrand Merlier and H  l  ne Planel
- ◆ supported by AFIM (Association Fran  aise pour l'Informatique Musicale) and by Th  l  me Contemporain (Association de Creation et de Diffusion en Informatique Musicale).





Objectives

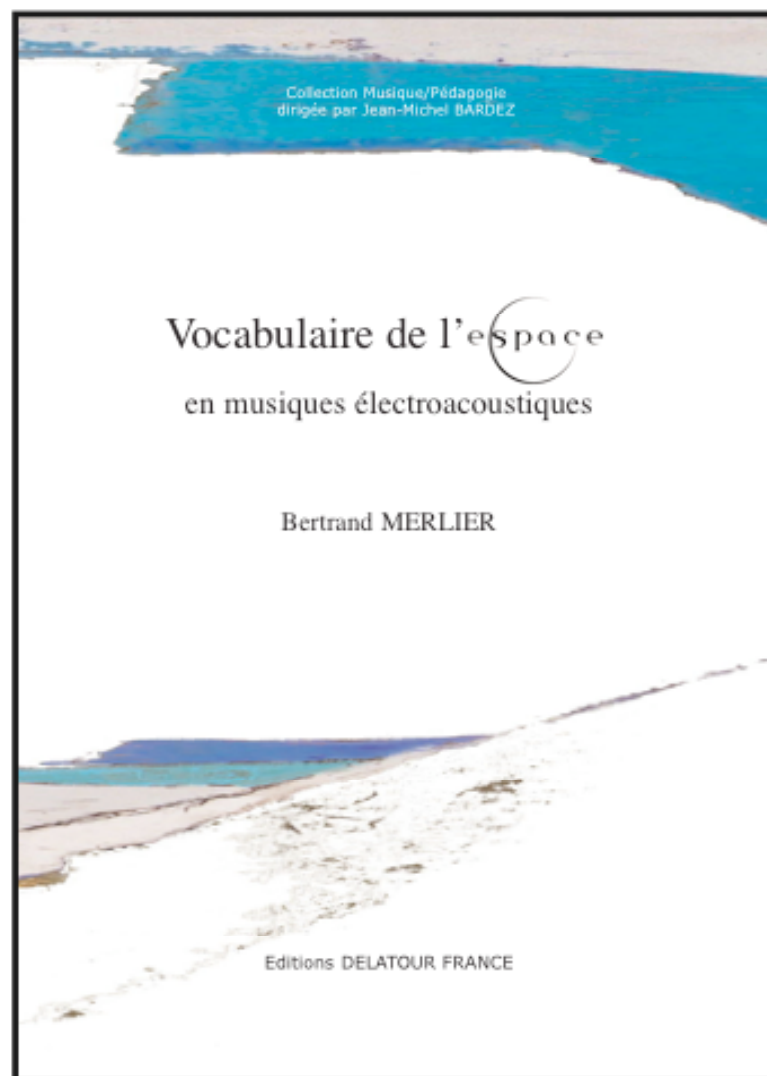
- ◆ make an inventory of space actors: creators, acousticians, psychoacousticians, computer engineers, musicologists...
- ◆ make an inventory of knowledge and techniques
- ◆ clarify vocabulary and practices



Projects

Two important projects (done or under development):

- 1) « The vocabulary of space in electroacoustic musics »
published in October 2006 (éditions Delatour – FRANCE)
- 2) A DVD of sound examples is scheduled for 2007



NOUVEAUTE 2006

Vocabulaire de l'espace en musiques électroacoustiques

La réalité virtuelle, les environnements sonores, le cinéma en Dolby Digital, les chaînes Hi Fi au standard 5.1 nous font pénétrer de fait dans un autre monde sonore où l'espace joue un rôle de plus en plus prépondérant. L'espace se compose, se manipule, se capte, se fixe, s'écrit, se synthétise... Les musiciens, les ingénieurs du son, les concepteurs d'environnements sonores... et les auditeurs ont besoin d'un vocabulaire précis afin de parler ou de décrire l'espace, ou simplement de mieux l'apprécier.

Ce vocabulaire de l'espace du son présente un état des lieux :

- des connaissances scientifiques en acoustique et psychoacoustique
- des matériels et logiciels permettant de capturer, fixer, manipuler, simuler l'espace ;
- des différents points de vue techniques et esthétiques ;
- des nombreuses pratiques ;
- et aborde les questions de description, de syntaxe, d'écriture, voire de notation.

390 termes, des milliers de définitions...

Cet ouvrage synthétise vingt années de pratiques et de recherche en matière de spatialisation du son.

Bertrand Merlier : Maître de Conférences à l'université Lumière Lyon 2 (en informatique musicale et techniques de studio), compositeur.

222 pages - ISBN 2-7521-0035-3 - Référence DLT1472 - Prix public conseillé : 20,00 € TTC



Vocabulaire de l'espace

en musiques électroacoustiques

Presentation

- ◆ a lexicon gathering all the vocabulary in use as regards spatialization of electroacoustic musics or sound space
- ◆ about 400 words and more than 1200 definitions
- ◆ only musics produced or reproduced by means of loudspeakers



Vocabulaire de l'espace

en musiques électroacoustiques

Contents

- ◆ common nouns, adjectives, verbs, locutions, expressions...
- ◆ scientific, artistic, aesthetic, usual vocabulary...
in acoustics, psychoacoustics, computer science,
electroacoustic composition or interpretation, musicology...
- ◆ aesthetic principles or technological processes,
characterisation of sound recording or sound transformation,
perceptive effect description, composition processes...



Vocabulaire de l'espace

en musiques electroacoustiques

Interests

An inventory of fixtures:

- ◆ in acoustics and psychoacoustics scientific knowledge ;
- ◆ in hardware and software allowing to capture, fix, manipulate, simulate space ;
- ◆ in various technical or aesthetical view point ;
- ◆ in various and multiple practices ;
- ◆ in description, syntax, writing or even notation questions ;



Vocabulaire de l'espace

en musiques électroacoustiques

Objectives

The gathering and analysis of most of the vocabulary in use in the community should allow:

- ◆ to start reflections about terminology ;
- ◆ to facilitate communication and exchanges between the various actors of these artistic or technical worlds.



Vocabulaire de l'espace

en musiques électroacoustiques

Method

Documentary sources

A collection of all the words in use
in various paper or Web publications
as regards electroacoustic musics spatialization

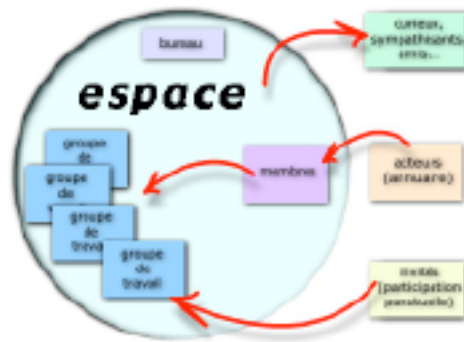


Vocabulaire de l'espace en musiques électroacoustiques

Problems

Divergences of meanings and multiple definitions

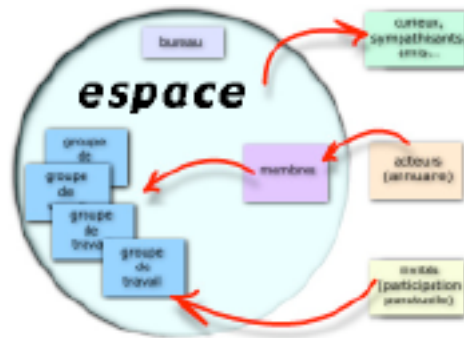
- ◆ human hesitations about the meanings of words ;
- ◆ multiple realities : physics, psychoacoustics,
different contexts,
different artistic ou aesthetic concepts,
different practices, multiple tools...
- ◆ point of view of the **emitter** (sound source, fabrication processes...)
point de view of the **receiver** (perception).



Taxonomy of space

It is in the nature of things that an explorer cannot know what he is exploring, before he did explore it. He has neither the Lonely Planet Guide, nor any unfolding for tourists that tells him which church to visit, or in which hotel to rest. All that he has at his disposal is an ambiguous folklore, transmitted from mouth to ear, by those who, before him took the same way.

*Gregory Bateson, Towards an ecology of the spirit
éditions du Seuil, FRANCE, 1977*



Looking for categories...

Level 1 : two domains : the concrete and the abstract

- ◆ the **concrete** : the physical or physiological reality of space ;
- ◆ the **abstract** : the search for abstractions allowing to describe or formalize this reality.

Level 2 / concrete: activities, means

space (or setting in space) is a consequence of a natural interaction between sound with its environment or with some human action.

action → means → consequence.

Each activity calls upon means, tools, methods...

Level 2 / abstract: descriptions and conceptualisation

First of all, studying space requires listening, observations, measurements, descriptions, graphical or mental representations ;

Secondly, it requires analysis, interpretation (2), formalisation, conceptualisation.

level 1 domain	level 2 categories	subcategories	precisions
concrete	actions ↓	production	idea, intention, conception, creation, concretisation, composition, emission, fabrication, interpretation (1), le « faire », performance, realisation, space synthesis,
		diffusion transmission fixation	transport, propagation, acoustic or electric or digital transmission or support, fixing,
		perception capture	hearing, audition, psychoacoustics, listening conditions
	means ↓	manner	principle process
		tools instrument	hardware software

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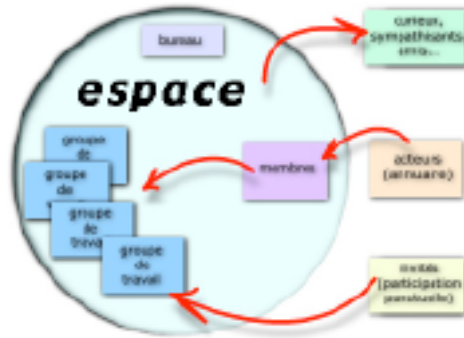
abstract	 description	properties characteristics representation image(s) of reality	measures verbal, graphical, mental representations
	 concepts	descriptive or prescriptive notation interpretation (2) analysis musicology	

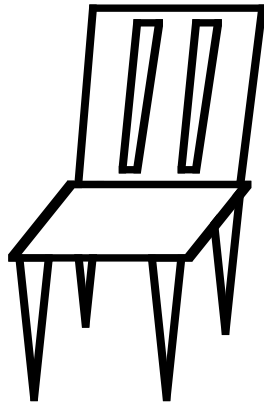
Tableau 1 : taxonomy of space



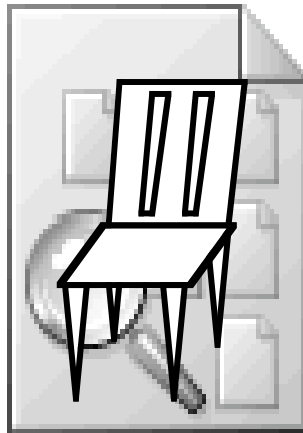
Describing reality... (1)

with the help of our taxonomy

Each word has several meanings, according to whether one considers:



chair
the **reality**,

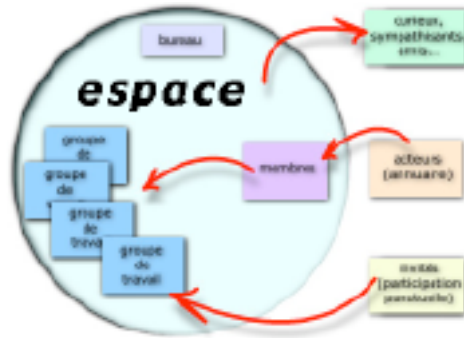


picture of a chair



chair definition
in a dictionary

the **image** of reality or the **conceptualisation** of reality.



Describing reality... (2)

with the help of our taxonomy

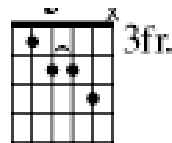
Example :

a musical gesture that produces a chord on an instrument

A chord of notes can be:



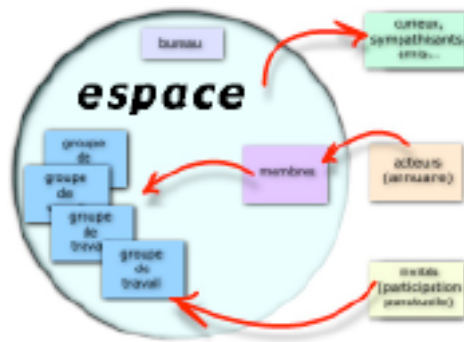
the **perception** of a note
aggregate



tablature
(« picture » of the gesture)



stave notation
(coding + abstraction)



Application examples (1)

using taxonomy

Solving omissions

Example : Panoramic

« rotary potentiometer that allows moving a sound between two loudspeakers »

The author only considers the space **production tool**.

and omits to consider : the concrete result (alternate variations of sound level)
and the **perception** of a sound moving between the two loudspeakers.

level 1 domain	level 2 categories	subcategories	precisions
concrete	actions ↓	production	i
		fixation	
		perception	hearing audition
	means ↓	manner	principle or process
		tools	hardware or software

<<< SPACE >>>

abstract	↑ description	properties characteristics representation	
	↑ concepts	notation analysis	

Tableau 1 : taxonomy of space

PANORAMIQUE, PAN

A- Outil matériel de production ; Hardware tool for production ;

Potentiomètre permettant de contrôler simultanément l'amplitude du son sur deux haut-parleurs dans des directions opposées : ...

Potentiometer allowing to simultaneously control the sound level on two loudspeakers in opposite directions: ...

B- Procédé de production ; Process of production ;

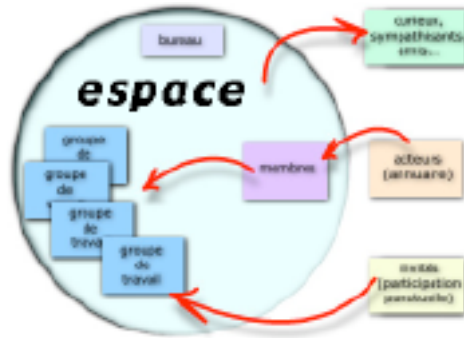
Modification simultanée de l'amplitude du son de deux canaux audio dans des directions opposées ...

Simultaneous modification of the sound level of two audio channels in opposite directions...

C- Description de la perception ; Perception description ;

Sensation de déplacement (généralement latéral) d'un son entre les deux haut-parleurs d'un espace stéréophonique ou, par extension, entre ...

Feeling of the lateral movement of a sound between the two loudspeakers of a stereophonic space or, by extension, between...



Application examples (2)

using taxonomy

Solving ambiguities

Example : **spatialized music**

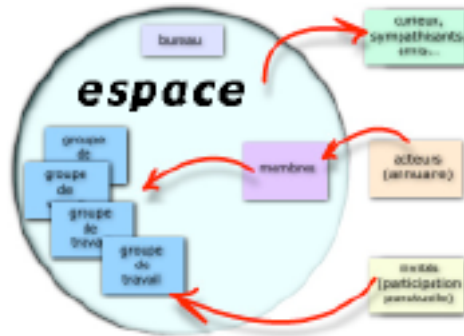
Does the author speak of :

- ◆ the **production** of spatialization ?
- ◆ the **perception** of a state ?
- ◆ the concert itself ? (reality of listening conditions or ...)
- ◆ the recording of this concert on a support ? (mean of **transmission**)

Is the production of spatialization realized live during the concert (**interpretation**) ?
or was it pre-recorded (or pre-realized) in studio (multiphonic **writing**) ?

production	multiphonic writing (composing)	performance with a diffusion equipment	space synthesis (SPAT...)	<i>etc.</i>
transmission recording fixing	ADAT or 5.1 DTS CD	automation data notation ?	acoustics or psychoacoustics data	<i>etc.</i>
perception	domestic listening fixed show (operator)	concert (performer)	virtual reality	<i>etc.</i>

Table 2 : various possible contexts and meanings for the word « spatialized »



Application examples (3)

using taxonomy

To solve ambiguities

movement or sound trajectory

Neither the loudspeaker, nor the sound itself are moving !

It is only a mental illusion of movement, the image of a movement.

Therefore it is interesting to consider:

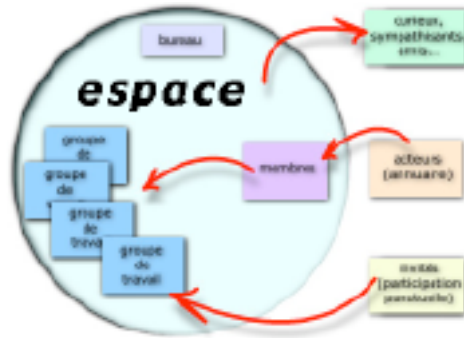
the **production**, the **transmission**, the **perception**,

the **description**, the **characteristics**, the mental **abstractions**

associated to that movement...

categories	reality	image of reality
production	tools and processes sending electric signals on 1 or more loudspeakers	
transmission fixing	fixing sounds on a multitrack support	curve(s) drawn into a spatialization software
perception	illusion of movement our brain perceives a moving virtual source (detached from the loudspeakers membrane	our brain recognizes or imagines a sound trajectory

**Tableau 3 : various contexts and meanings for the words: « movement »
or « sound trajectory »**



Application examples (4)

using taxonomy

Example of multiple meanings

a distant sound

« Qui se trouve à une grande distance dans l'espace ou le temps ». (Larousse)

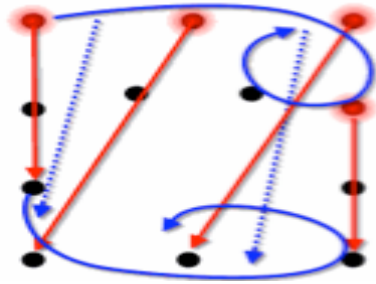
« Far away in space or time ».

« At a long distance in space or time ».

This definition – applied to space – is really incomplete,
because it only considers reality and omits the perception of reality.

- production** loudspeaker located 30 metres away
and turned its face against a wall (indirect)
or loudspeaker located 2 metres away
reproducing a record of far sound events
or space synthesis of distance by means of data processing

Perception may be similar in all three situations !



Conclusions (1)

The vocabulary of space

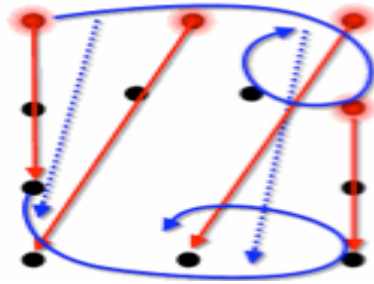
Towards a better knowledge of space and spatialization...

The « vocabulary of space » gathers most of the terminology **in use**.

It offers to anyone's disposal: a more precise vocabulary, more words,

It should allow considering space analysis and ideas formalisation,

It can help also for the improvement of tools and processes...



Conclusions (2)

inaccuracies and gaps...

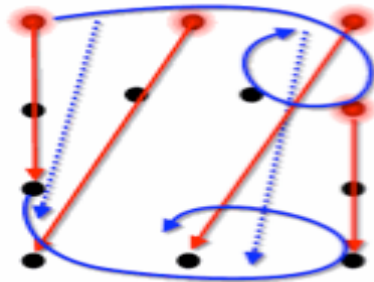
Our study reveals numerous inaccuracies and gaps as regards space vocabulary and especially description or conceptualisation vocabulary.

We presented here some reflexions about the meanings of words
or their multiple significances.

We proposed to carefully distinguish:

reality (that exists independently of the observer)

and conceptual systems (aesthetic theories or logics developed by « space actors »), symbolic or abstract constructions that try to describe or govern reality.



Conclusions (3)

taxonomy and systemic

« Space as a great organisation »

Beyond this simple vocabulary, we also propose a dynamic tool: a **systemic of space**.

Elements (collection of words and definitions) are not sufficient enough to understand the globality of what is space.

It is also necessary to study **relations and interactions** between elements.

In that way, our approach of the problem falls under new paradigms of handling and formalizing knowledge, that appeared in the middle of the XXth century: information theory, structuralism and system concept.