

Valerio Sannicandro

Ius Lucis

2007

Agora 2007
2007



The setup and the execution of the electroacoustic part
of this work requires a Computer Music Designer (Max expert).

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Work related information

Performance details

- June 6, 2007, Paris, Centre Pompidou, Grande Salle et Ircam, Espace de projection

Publisher : Suvini Zerboni

Detailed staff

- 2 flutes (also 1 bass flute), 2 oboes (also 1 English horn), 2 clarinets (also 1 bass clarinet), 1 contrabass clarinet, 2 horns, 2 trombones (also 2 tam-tams), 1 percussionist, 1 electronic/MIDI keyboard/synthesizer, 2 violins, 1 second violin, 2 violas, 2 cellos, 2 conductors

Realisation

- Serge Lemouton

Event

- Utopia - Wed 06 Jun 2007 - Centre Pompidou, Grande Salle - Agora 2007

Useful links on Brahms

- [Ius Lucis for two ensembles in two rooms \(2006-2007\), 30mn](#)
- [Valerio Sannicandro](#)

Version related information

First performance

Performance date: June 6, 2007

Documentation date: June 6, 2007

Version state: valid, validation date : May 3, 2018, update : May 6, 2021, 3:10 p.m.

Documentalist

You noticed a mistake in this documentation or you were really happy to use it? Send us feedback!

Realisation

- Valerio Sannicandro (Composer)
- Serge Lemouton (Computer Music Designer)

Version length: 28 mn

Default work length: 30 mn

Other version(s)

- [Valerio Sannicandro - Ius Lucis - transfert_mustica_ftp](#) (April 14, 2010)

Electronic equipment list

Computer Music Equipment

- 2 Macintosh G5 - *Apple Desktops* (Apple)
each computer has an audio interface with at adat ports [CPU clock] [CPU number] [RAM quantity] [HDD size]
- 2 MY-16-ES - *Sound Board* (Yamaha)
bidirectionnal audio communication between the two rooms
- 2 BCF 2000 - *MIDI Mixer* (Behringer)
[Nb of channels:8]

Audio Equipment

- 2 DM2000 - *Digital Mixers* (Yamaha)
[Mono input] [Stereo input] [Mic input] [Aux] [Bus] [Output] [Digital] [Analog] [Input]

Video

- 1 Camera - *Camera*
to film the conductor image to the players in room 2
- 6 Video Monitor - *Video Monitor*
for the musicians in room B

Files

File	Type	Author(s)	Comment
uploads/Sannicandro/iustlucis2007.dmg	Patch		

Instructions

Details - communication between the two concert halls

In order to communicate correctly during the preparation, the rehearsal and the performance of *ius lucis*, it is important to create adequate ways of visual and audio communications between the two places.

Audio intercom

In addition to a conventional audio intercom between the technical teams, we used a dedicated telephonic line between the sound regies.

network messaging

The computers are connected via an internet line. The computer music designers responsible of the transformations were communicating informations during the rehearsal via the iChat messaging software.

Video projection

For the musical synchronisation of the ensembles, the 6 musicians in room B should have a video image of the conductor located in room A. As they are separated from each other, each one of these musicians have a video monitor.

Details - Midi Devices

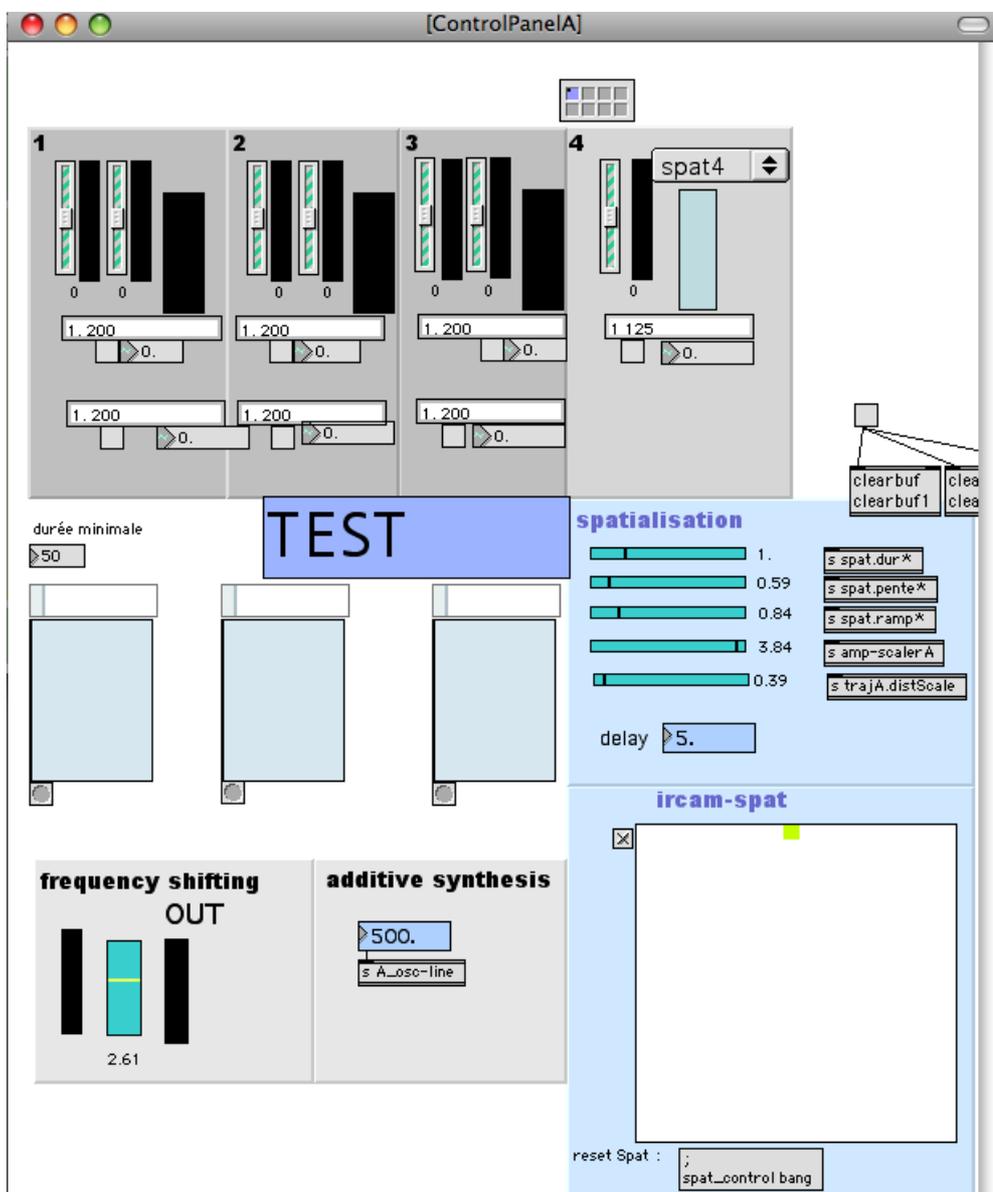
Midi Keyboard in ensemble A

All the electronic events of *ius lucis* are triggered by the Midi keyboard playing in ensemble A. It should have 88 keys and the possibility to send program changes. This keyboard is directly connected to the computer of room A. These informations are sent to the room B computer thru UDP vi the ethernet line (see patch UdpToEspro in main max patch).

Midi Mixers

To control the live balance of the transformation, two midi mixers (one in each room) are used. 8 faders controls the levels of the different "voices" of cross synthesis (see score)

- 1.Cross synthesis 1
- 2.Convolution 1
- 3.Cross synthesis 2
- 4.Convolution 2
- 5.Cross synthesis 3
- 6.Convolution 3
- 7.Spatialization 4 (and Ircam-Spatialisateur)



Ius lucis control panel subpatch

Details - Computers audio inputs

Ensemble A

- in1 : oboe1
- in2 : percussion
- in3 : clarinette micro 1
- in4 : clarinette micro 2
- in5 : trio left (flute1, horn1, violin 1)
- in6 : trio middle (contrabass clarinet, viola, cello)
- in7 : trio right (flute2, horn2, violin 2)

There is 2 microphone for the Bb clarinet : one in front of it. and another one off axis by approx. 1 meter. This microphone is used for movement detection of the clarinetist in several sections of the work

The 3 trios are premixed.

Ensemble B

- in1 : oboe2
- in2 : clarinette micro 1
- in3 : clarinette micro 2
- in4 : trombone 1
- in5 : tam 1

- in6 : trombone 2
- in7 : tam 2
- in8 : viola 2
- in9 : cello 2

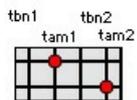
There is 2 microphone for the Bb clarinet : on in front of it. an other one off axis by approx. 1 meter. This microphone is used for movement detection of the clarinetist in several sections of the work

Special microphones to capture the tam resonances



obl		-26
perc		-26
cll		-26
cllB		-26
trioL		-26
trioM		-26
trioR		-26

Ius - sound inputs A



ob2		-25
cl2		-25
cl2B		-25
tbn1		-25
tam1		-25
tbn2		-25
tam2		-25
al2		-9...
vc2		-9...

Ius - sound inputs B

Details - loudspeakers configuration

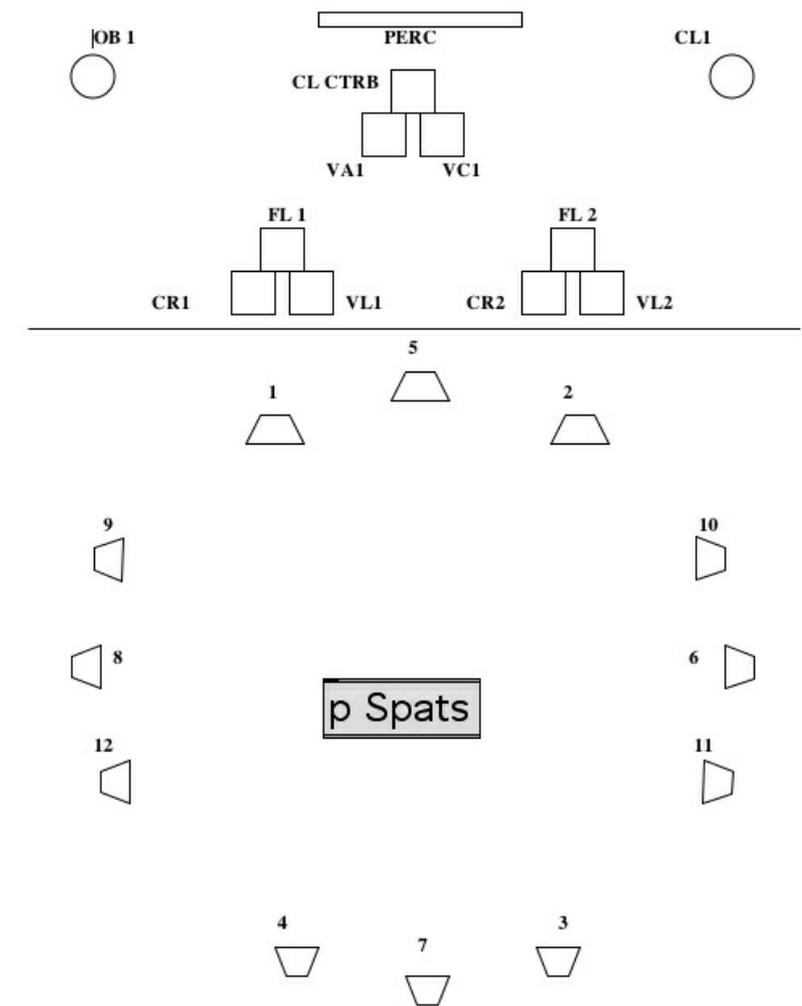
Orchestras amplification

The instruments should be amplified locally and in a natural way.

Diffusion of the electronic parts

The sound transformations generated by the computers are spatialized in the halls

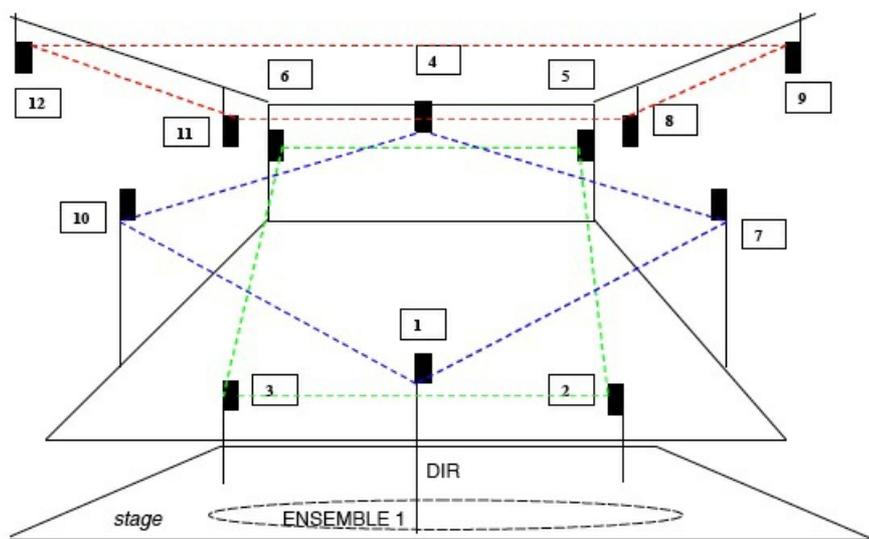
For this purpose, independantly from the loudspeakers required for the amplification, the audio outputs from the computers are sent to a set of 12 speakers for room A and 8 speakers for room B. This speakers are located around and above the audiences. For the placement of the speaker, refer to the following pictures



Loudspeaker setup for Room A

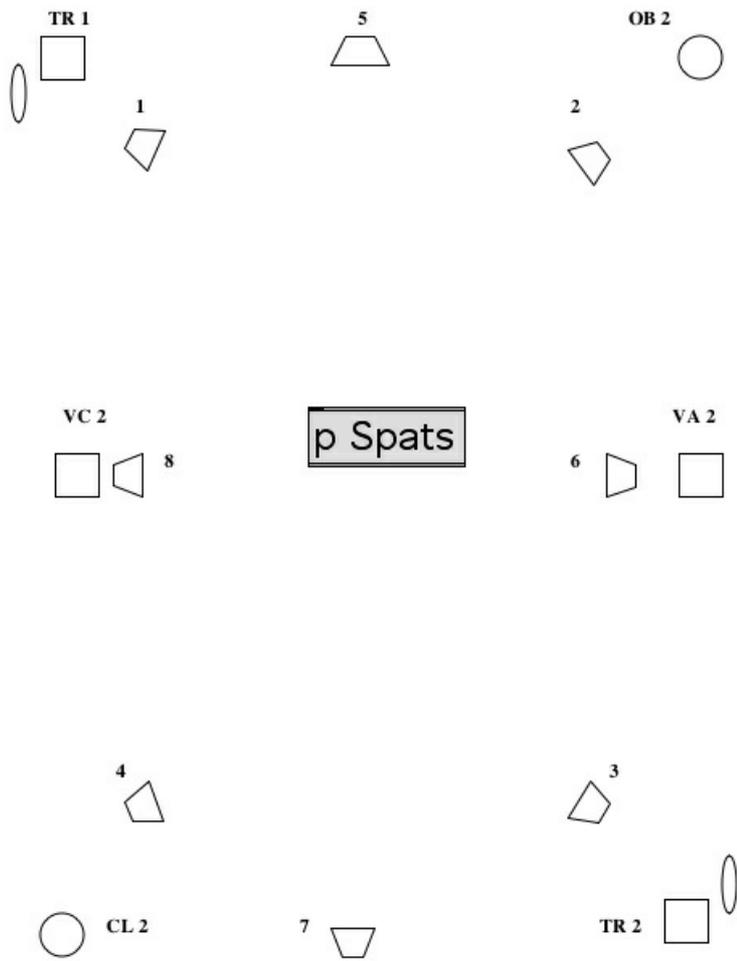
LOUDSPEAKER DIAGRAM

red, blue and green LS groups are placed at the same level



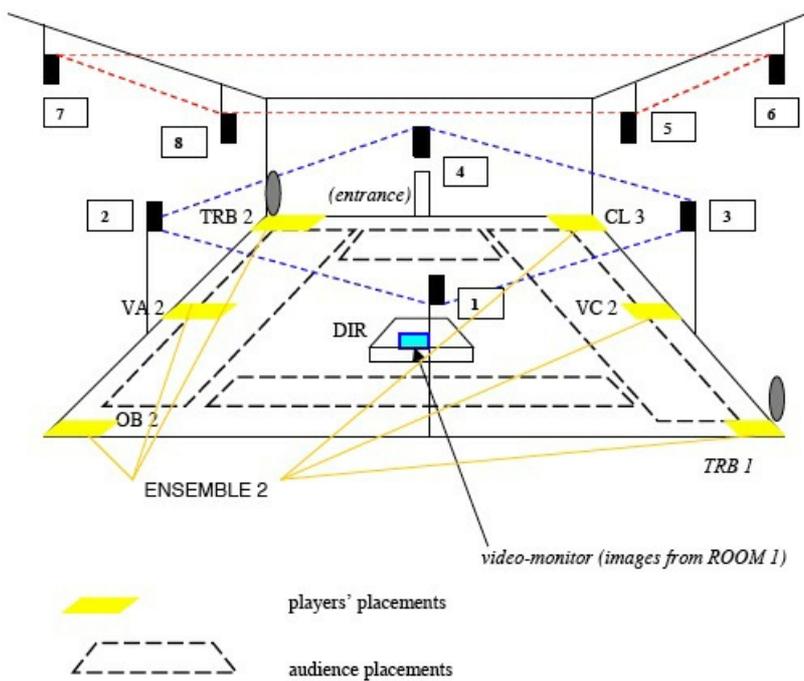
LS 1 – 2 – 3 used also for direct sound amplification

Loudspeaker setup for room A

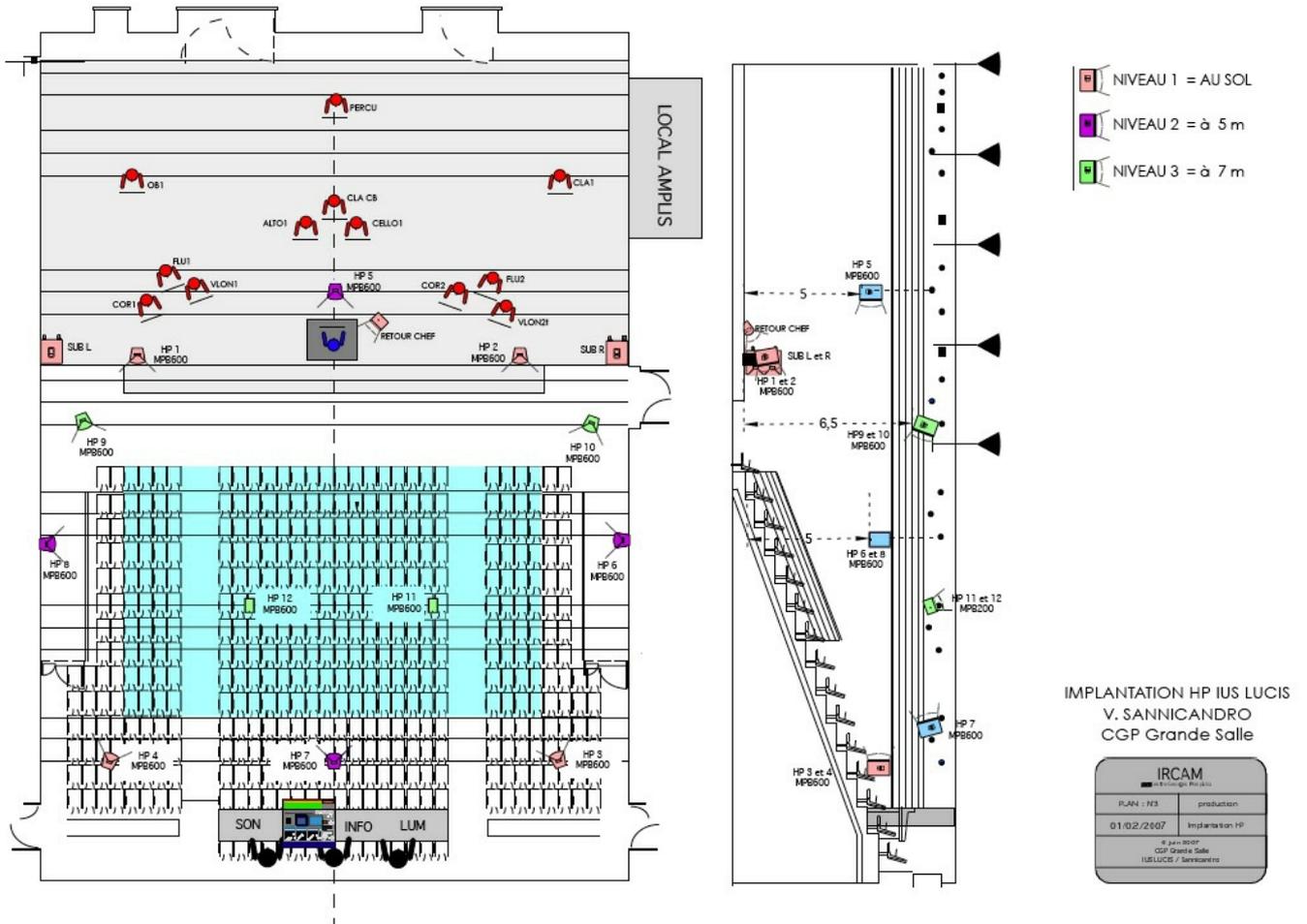


Loudspeaker setup for Room B

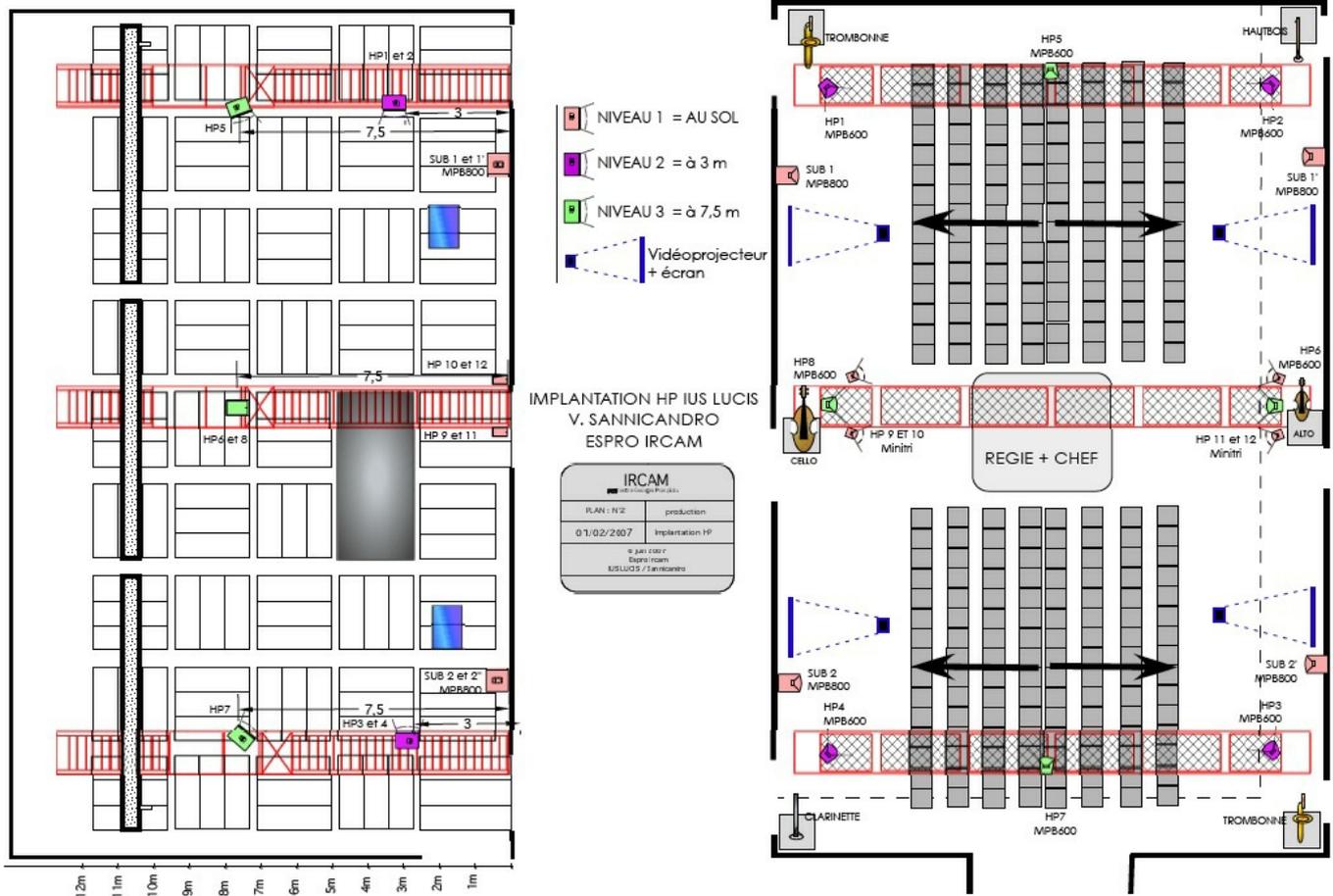
red and blue LS groups are placed at the same level



Loudspeaker setup for room B



Implantation CGP (A)



Implantation Espro (B)

Install - maxMsp software installation

copy the following folders on the hard disk of both Macintoshes :

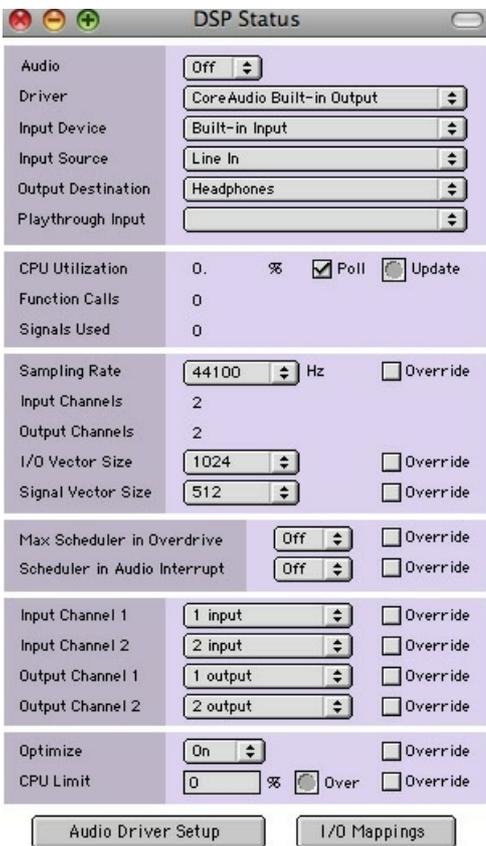
- ius-MaxPatches
- ius-sounds
- ius-java

Launch MaxMsp

Set the Max File Preferences to point to the following folders

- ius-MaxPatches/lib
- ius-sounds
- ius-java

In Max DSP Status, set the I/O Vector Size to 1024, the signal vector size to 512, and overdrive mode is off



Max status

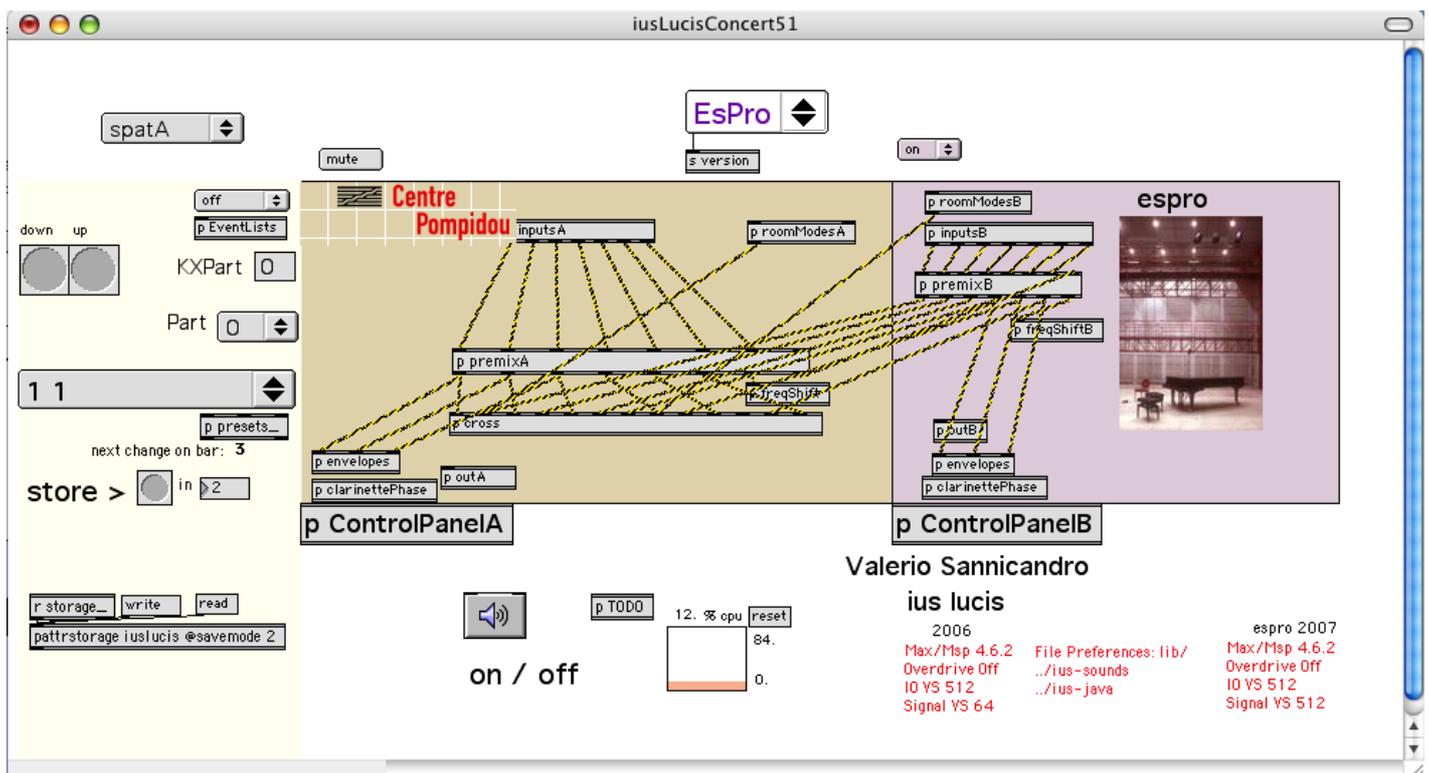
Patch presentation - ius lucis main max patch

There is only one patch for both rooms. We have decided to use exactly the same program on each computer.

This patch (the version used for the premiere was iusLucisConcert126v) has to different configurations. The right configuration can be selected using the menu at the top of the main window

"CGP", meaning "Grande Salle of the Georges Pompidou Center" corresponds to room A

"Espro", meaning "Ircam 's Espace de Projection" corresponds to room B



Ius lucis main patch

Initialization - software initialization check list

On the Mac G5, launch MaxMsp 4.6.3

Open the iusLucisConcert126v patch

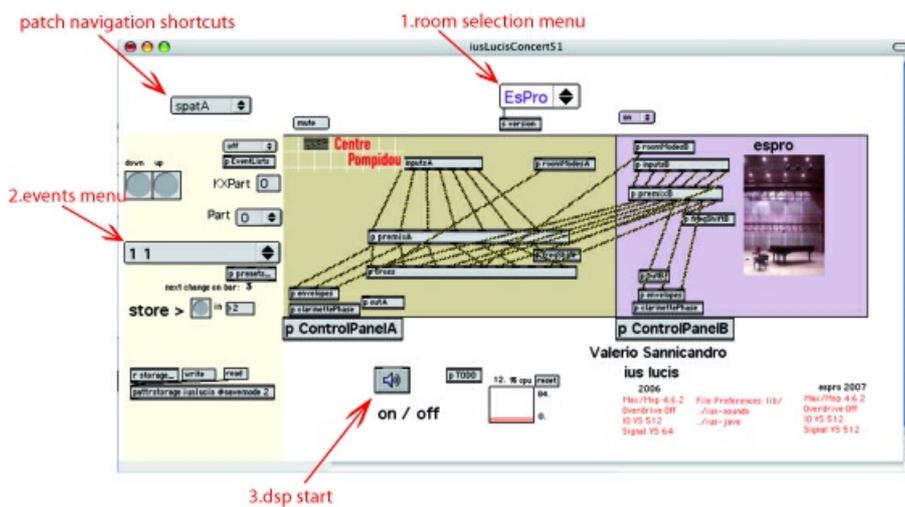
Depending on the room in which you are located, select the "CGP" or "Espro" mode

To initialize everything, select the "INIT 0" item on the event menu located at the left of the main main window.

Then select "TEST 0" in the same menu.

Turn the DSP on

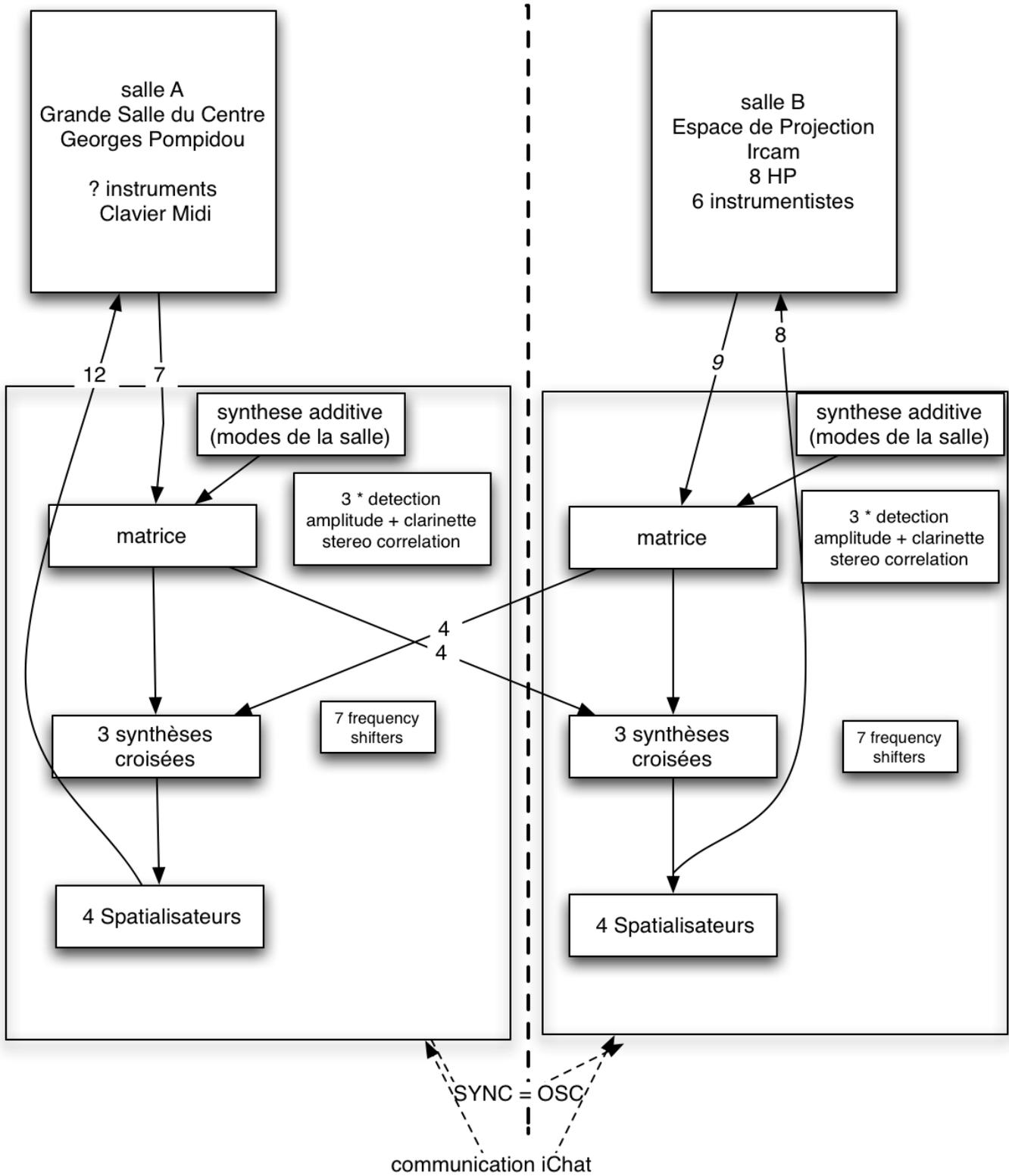
Ready to go !



Ius main max patch

Patch presentation - ius lucis patch contents

The following picture shows a synoptic view of the signal routing and treatments performed by the computer



Synoptic of ius lucis maxMsp patches

Patch presentation - Spatialisation techniques

Ircam "spatialisateur"

spatialisation vocabulary

Clarinets gesture audio captation

Estimation of the correlation of the sound signals received by two microphones located in front of the musicians

ius_spat.demo

Spatialisation vocabulary

ius lucis pan tools

p traj	trajectoire de groupes de hautparleur - temps constant	<pre>; spathL_init, 1 4, 2 11, 3 7 9, traj</pre>
p loop	boucle de groupes de hautparleur - temps constant	<pre>; spathL_init, 1, 2, 3, 4 5, 6 7 8 9, 10 11 12, loop</pre>
p pandyn	position contrôlée par la dynamique	<pre>; spathL_init, 1, 2, 3, pandyn</pre>
p trajdyn	temps total (->vitesse) contrôlés par la dynamique	<pre>; spathL_init, 1, 2, 3, trajdyn</pre>
p loopdyn	vitesse de la boucle contrôlée par l'amplitude locale	<pre>; spathL_init, 1, 2, 3, loopdyn</pre>
p oscil	l'espace change à chaque attaque	<pre>; spathL_init, 1, 2, 3 8, 4 6 7 11, oscil</pre>
p oscilloop	boucle change à chaque attaque (2 prog-loops)	<pre>; spathL_init, 1, 2, 3, oscilloop; ; spathHb_init, 4, 5, 6 7, 10 11 12, 8, oscilloop</pre>

spath

init / 1 9 8 / 1 1 2 4 / 1 5 3 / oscil init /

durée	pente	ramp (ms)	attaque	env/olar	durée	pente
3739	3.32	6	<input type="checkbox"/>	env	1000	1.5

loadmess 2

C

s spatius.mode

Spatialisation demo patch

spatius.help

spatius

an amplitude-based spatializer developed for the "ius lucis" project

init 1, 2, 3, 4

traj 1 2 5, 4 5 6, 3

loop 8 1 2, 3 4 5, 6 7

inlets: mode [traj, oscil....];
listes de HP, position

arguments: nombres de HP

0. 2 3 1 2 3, 3 4

bang : reports the number of lists

spatius 8

print a print b

0.5 1.5 2.

pente \$1

adsr_mode \$1

adsr 0.1 0.3 0.5 0.3

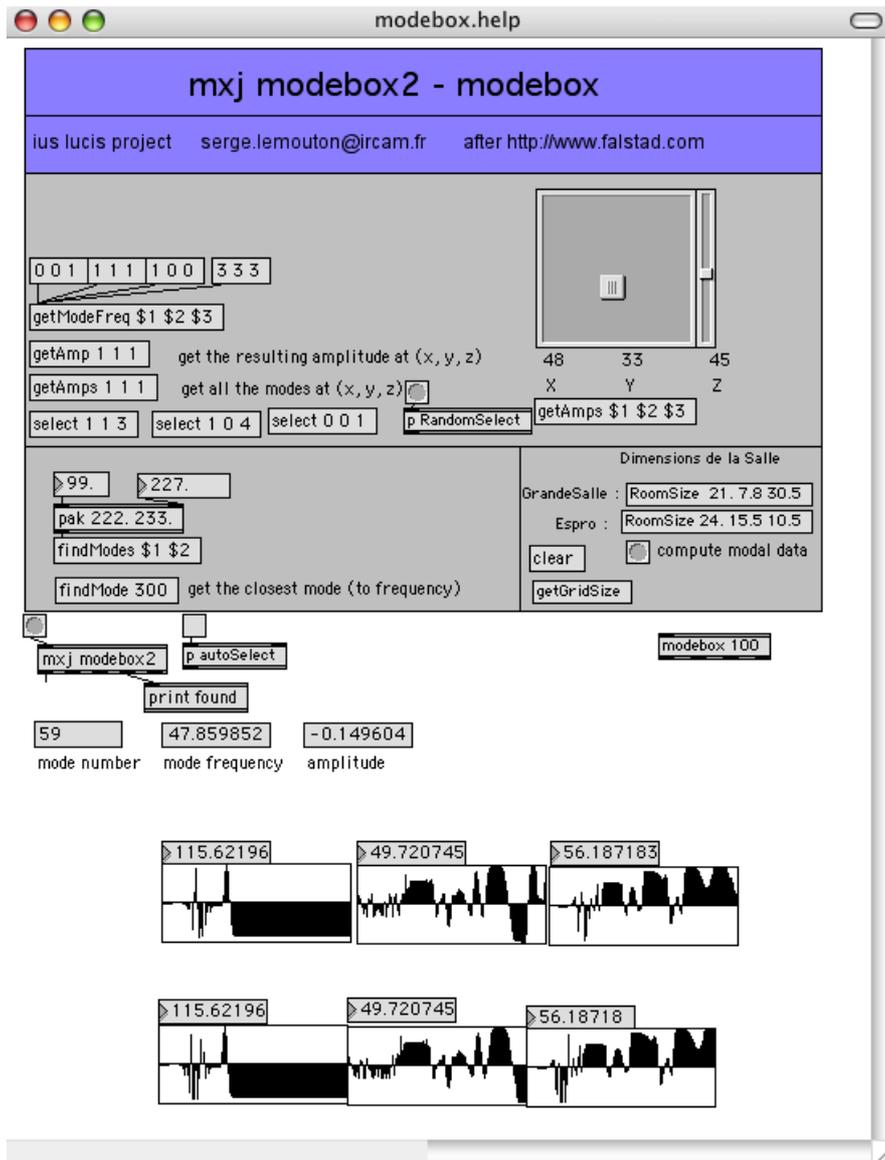
adsr 0.2 0.2 0.9 0.5

Spatius help patch

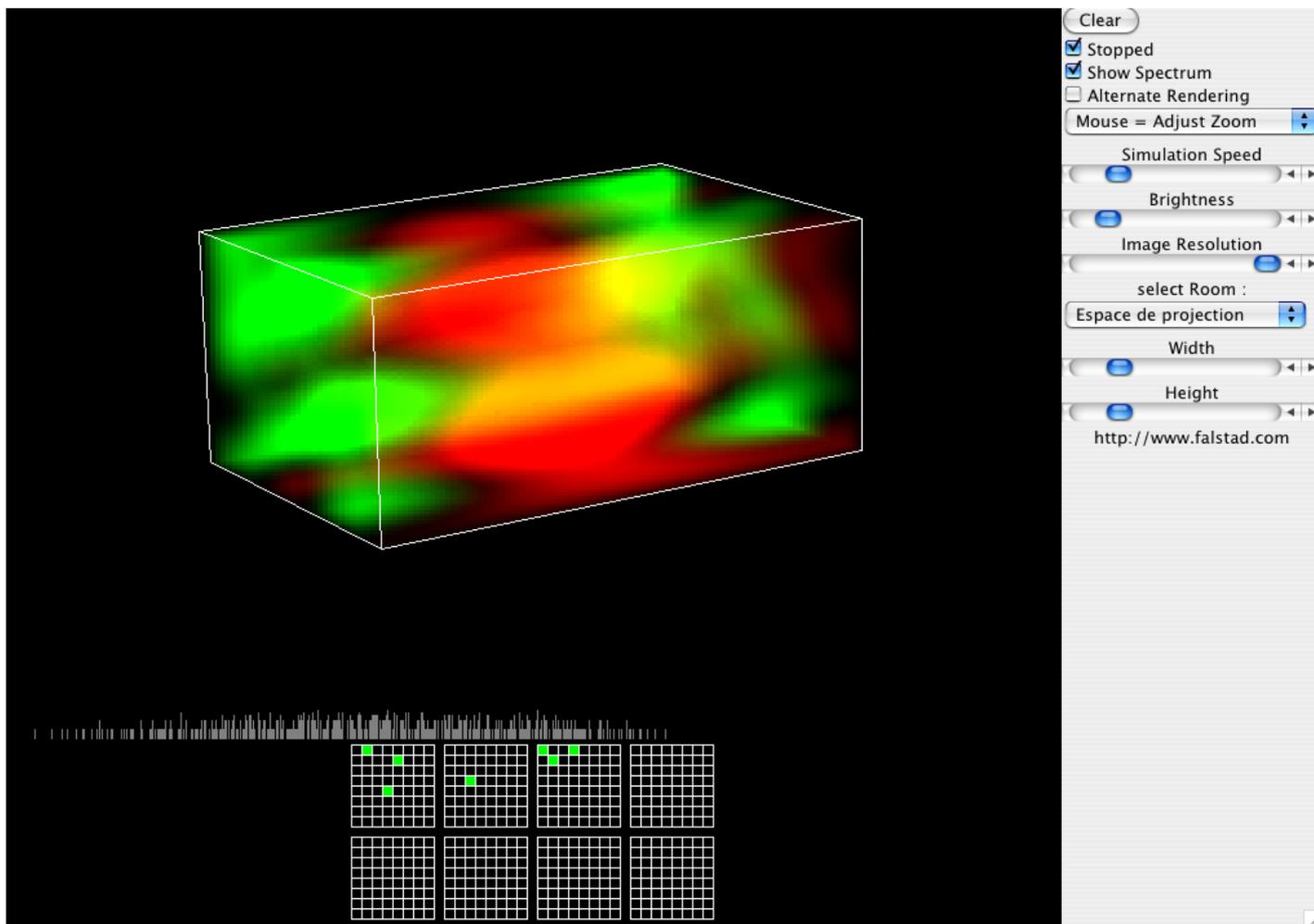
Patch presentation - rooms resonance modes

To calculate the resonance modes of the rooms, we have used an applet by Paul Falstad

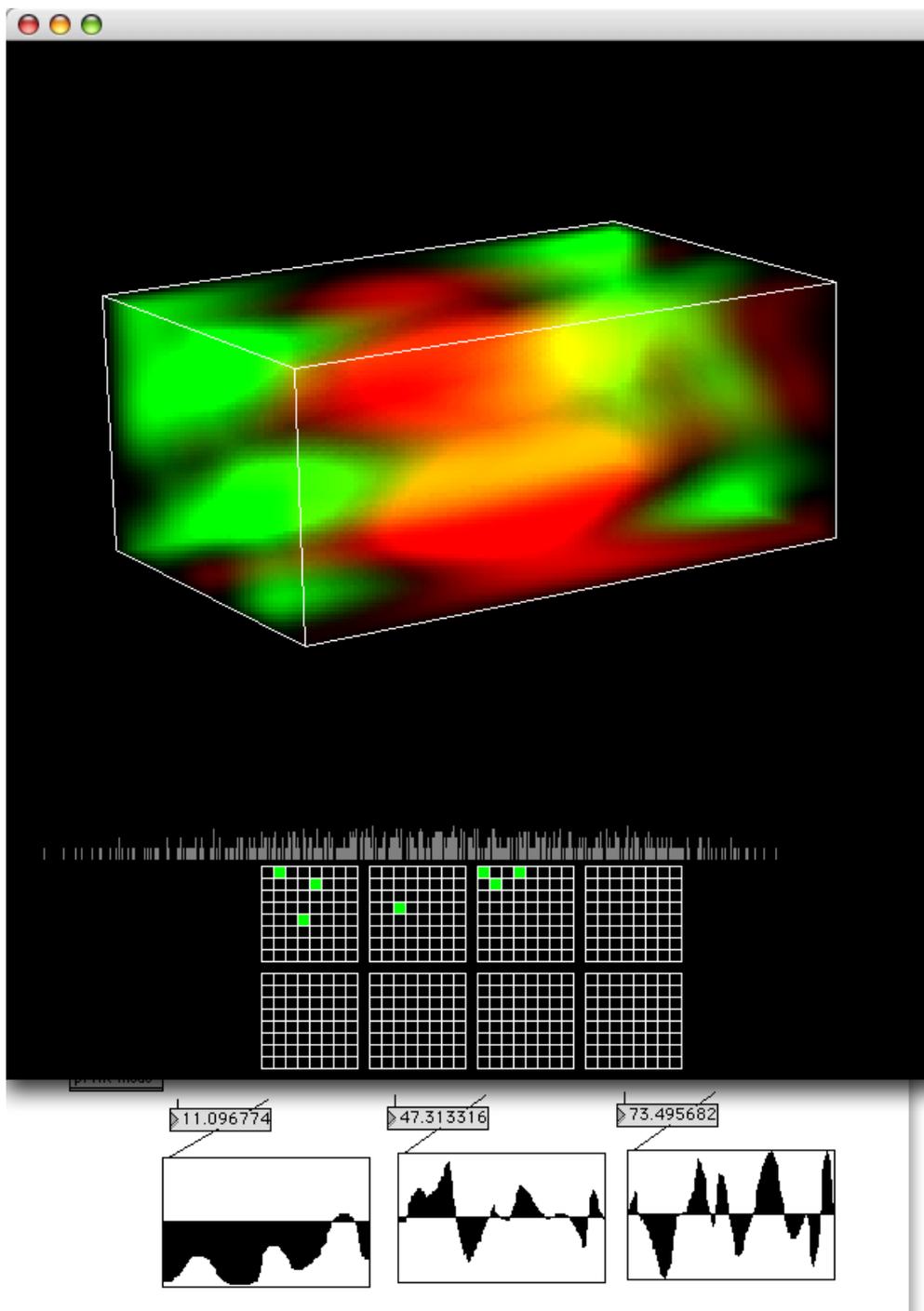
This java applet was ported to a max extern in C called modebox.mxo



Modebox patch



Mode exemple1



Modes exemple 2

Patch presentation - Real Time cross synthesis and convolution

Real Time cross synthesis and convolution

We developed a cross synthesis module in max msp. This module performs a real-time generalized cross synthesis close to the treatment provided by audiosculpt using the pfft~ object.

This module also perform a convolution on the two audio sources. The output of this convolution is then sent to a spectral mapping treatment controlled by the "spectral mapping mix" parameter.

It is possible to experiment with this module by opening the 2.ius.cross.demo that can be found in the SpectralTreatments folder.

FFT synthèse croisée

MSP : S. Lemouton

excitateur
Filter Source
FM

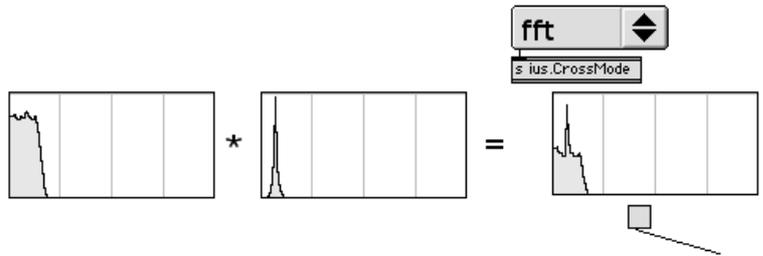
résonateur
Analysis Source
Pulse

pre-processing
Emphasis OFF
Normalize OFF

Pulse Control
Frequency
147...

FM Control
Carrier Mod. Index

Soundfile Control
open play stop loop



compression dynamic control

fft
s ius.CrossMode

convolve pas

detection d'attaques pour la convolution
là

params
0.5 0.47 0.5 0.53 0.77

spectral mapping mix
0

reset bypass2

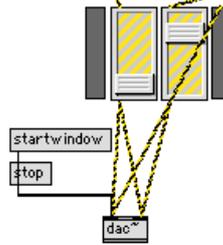
Son1
X 0.5
x 0.5
Y 0.47
y 0.53
q 0.77

spectral Mapping

clear

buffer~ spectrumMap 100

>0
peek~ spectrumMap
>0.



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Program note

Ius lucis est une œuvre pour deux ensembles dans deux salles, reliées l'une à l'autre. Chaque ensemble transforme la musique, en temps réel et de façon différente ; le degré d'interaction entraîne, pour chacune des deux perspectives, des combinaisons de synthèse sonore variées. La pièce doit donc être jouée deux fois, une fois pour chaque ensemble/espace. Après l'entracte, le public (divisé en deux groupes, dans chacune des deux salles) change d'espace et écoute la seconde partie, à la fois complémentaire de la première (plusieurs éléments et situations sonores réapparaissent et se recourent dans la mémoire du public) et inédite (changement radical de la spatialisation et de l'instrumentation). La forme générale de l'œuvre est construite comme un palindrome (comme dans un miroir) ; la partie centrale, « éloge de l'ombre », est l'axe de cette symétrie, un tournant après lequel l'ensemble 2 rejoue (avec des changements importants) la musique donnée par l'ensemble 1, mais dans le mouvement inverse. Ce passage marque également le point de départ d'un « déphasage » temporel et métrique entre les deux groupes instrumentaux. Composée pour les salles du Centre Pompidou et de l'Ircam, cette pièce se fonde sur la notion d'« espace architectonique ».

Premièrement, la construction de l'ensemble 1 (stéréophonique) et de l'ensemble 2 (musiciens situés autour du public) permet une spatialisation « orchestrée ». Ensuite, les mouvements sonores de l'électronique (haut-parleurs) sont étroitement liés à la musique (accents, enveloppes, articulations « traduits » en combinaisons spatiales) ainsi qu'à la directivité instrumentale de la clarinette (variation de timbre suivant la direction que donne l'interprète à son instrument). Ces procédés sont mis en valeur par des échanges de mouvements sonores entre les deux salles et représentent une forme étendue de contrepoint. Enfin, l'étude de l'acoustique des salles (analyses des modes de résonance), utilisée dans la structure compositionnelle, a servi de véritable « gestalt » harmonique et rythmique.

Ich möchte am Gebäude, das sich Literatur nennt, das Vordach tief herabziehen, die Wände beschatten, was zu deutlich sichtbar wird, ins Dunkel zurückstoßen und überflüssige Innenverzierungen wegreißen.

J'aimerais élargir l'avent de cet édifice, qui a pour nom « littérature », en obscurcir les murs, plonger dans l'ombre ce qui est trop visible, et en dépouiller l'intérieur de tout ornement superflu.

Tanizaki Junichiro, *Éloge de l'ombre*, traduit du japonais par René Sieffert, Publications Orientalistes de France, 1993.

Dans une œuvre conçue comme un diptyque, dont le véritable protagoniste est la mémoire en tant que « re-créatrice » de toutes les formes possibles, la musique est un réseau de sons, agrégats et profils qui ne connaissent jamais d'évolution linéaire.

Au contraire, ils se propagent, se replient sur eux-mêmes, s'étendent dans l'« espace » harmonique qui leur est attribué par un motif de structures qui, bien que complexe, est décrit comme un objet très simple : un palindrome.

Intense et inconstant, le flot des sons ne connaît que de rares pauses, le discours harmonique implose et se libère par moments dans des trouées imprévisibles, où seules quelques lignes soutiennent l'intégralité du discours.

Impalpables et éphémères, les sons de synthèse naissent des sons instrumentaux dont ils partagent la couleur, l'intensité et l'espace, et au centre duquel émerge, inquiétante et tellurique, une voix grave qui prend possession des deux lieux.

Valerio Sannicandro, Agora 2007.

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