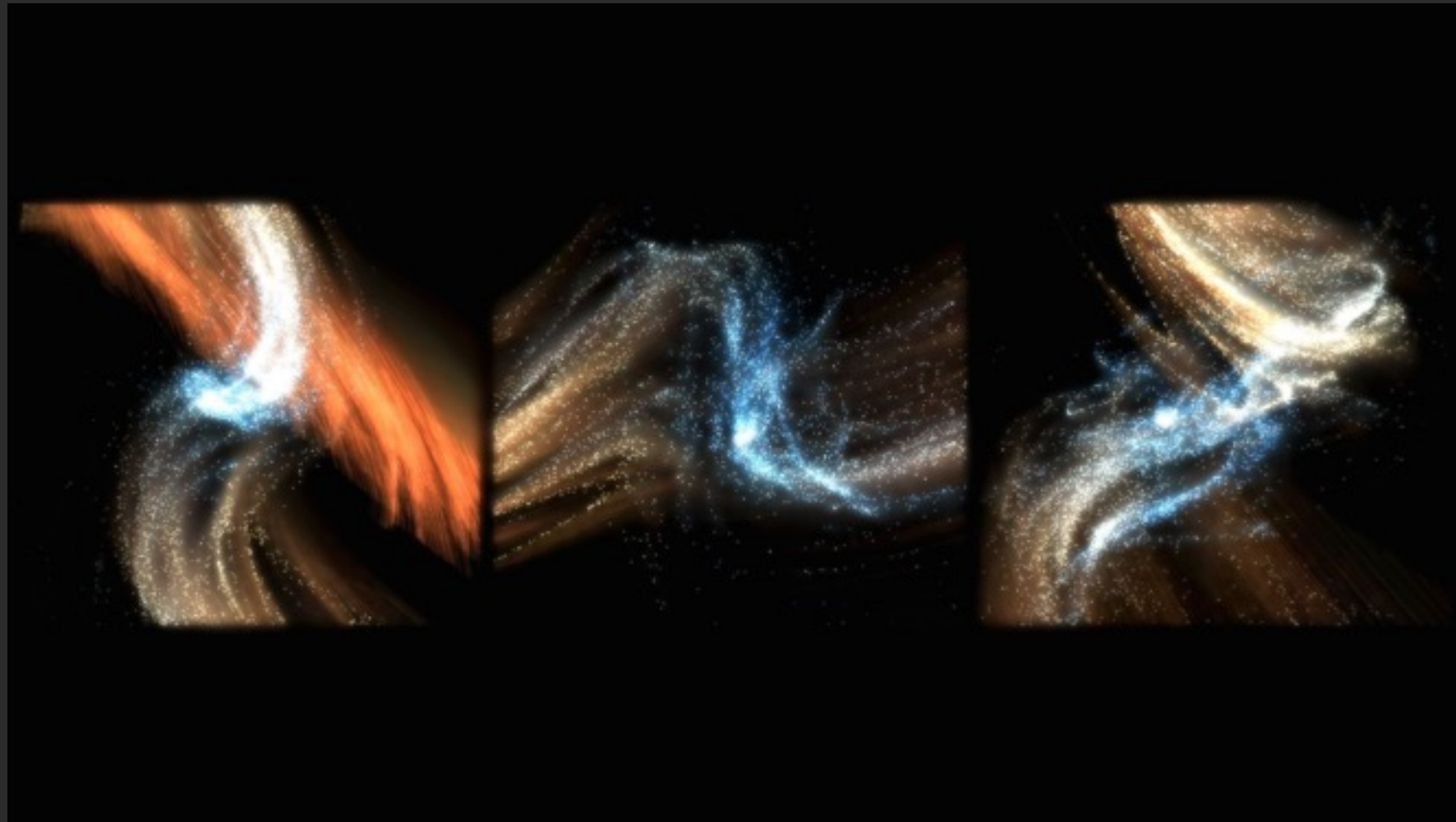


SYNTHESE D'INTERACTIONS MULTIMODALES PARCIMONIEUSES POUR L'ECRITURE DE L'ŒUVRE *IQUISME* ET L'ANALYSE DE SES PERCEPTS

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2. Cadre de l'étude
3. Atelier d'écriture numérique
4. Analyse du corpus
5. Première Expérimentation
6. Synthèse d'interaction multimodale

Le projet Iquisme

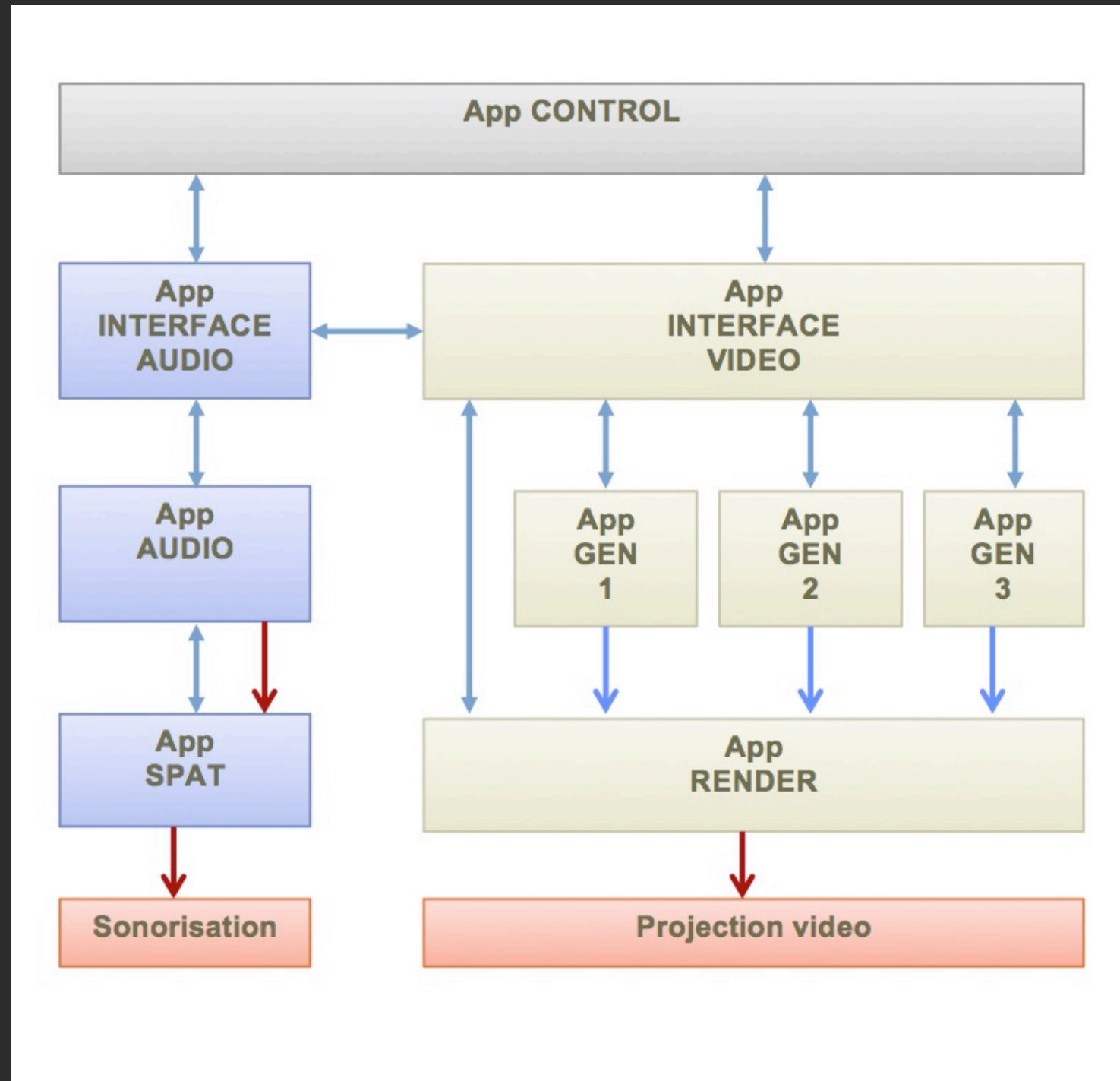
Envisagé sous 2 formes :

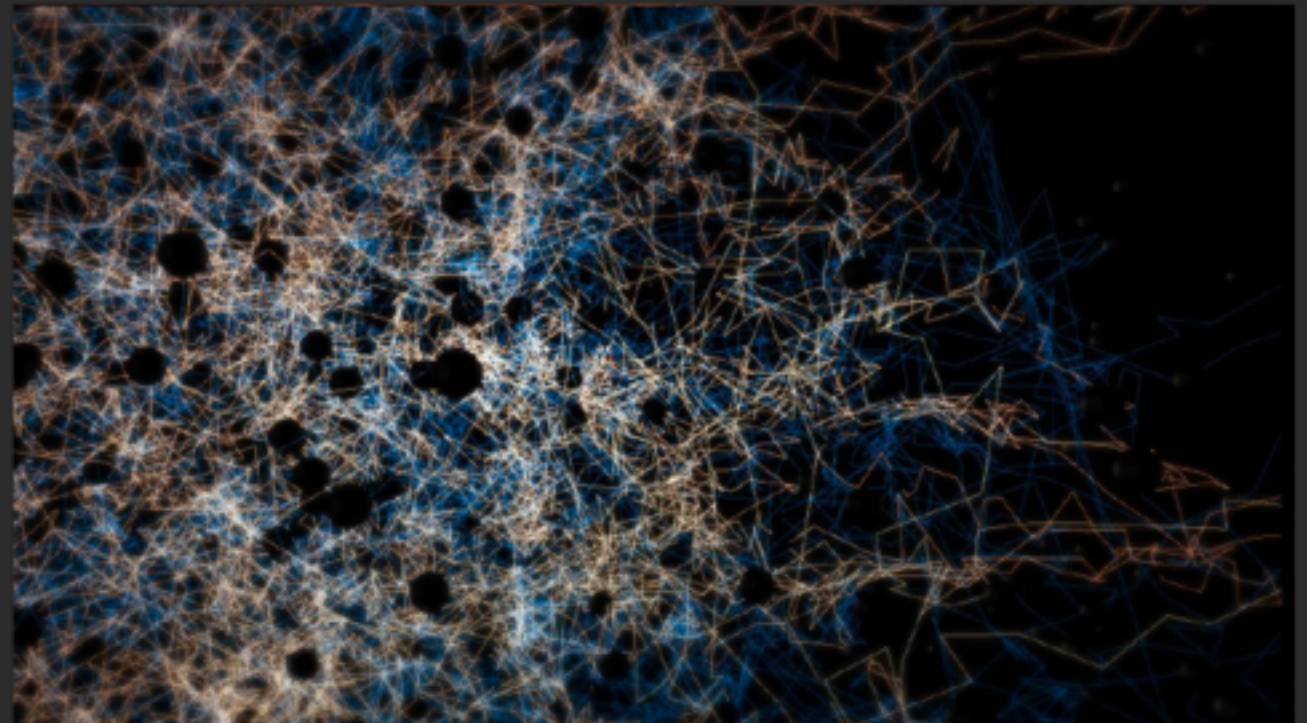
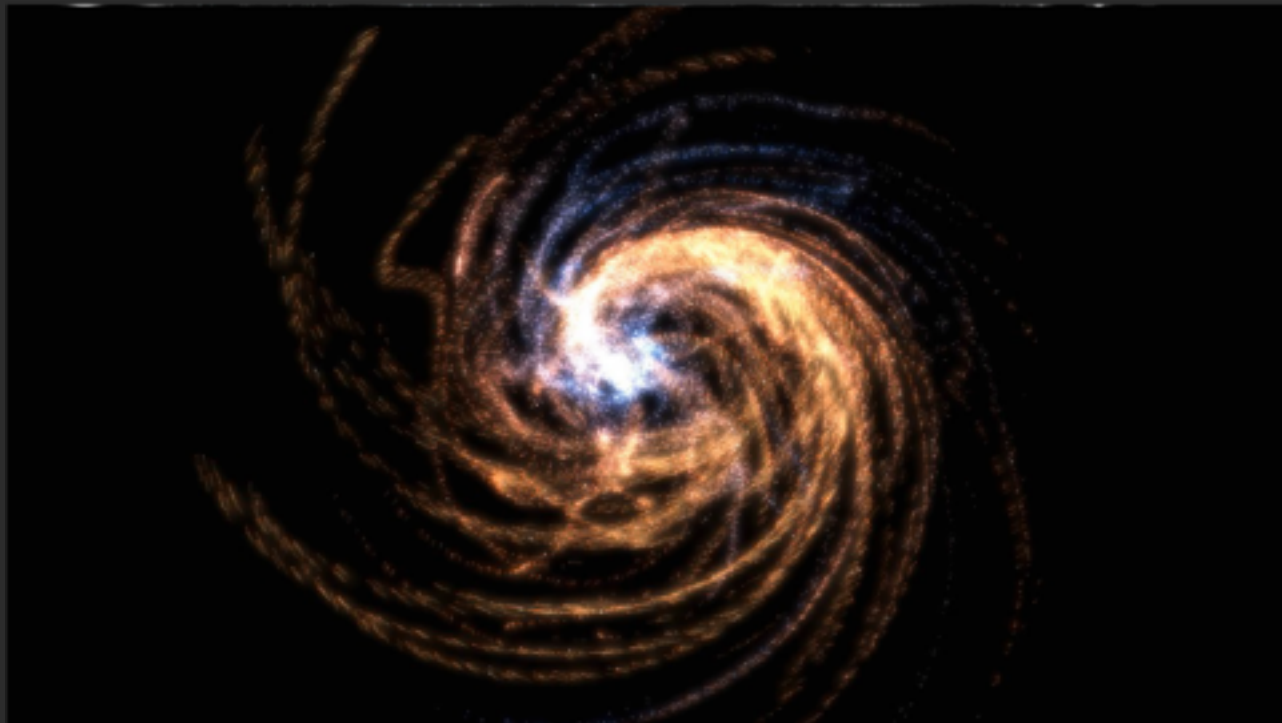
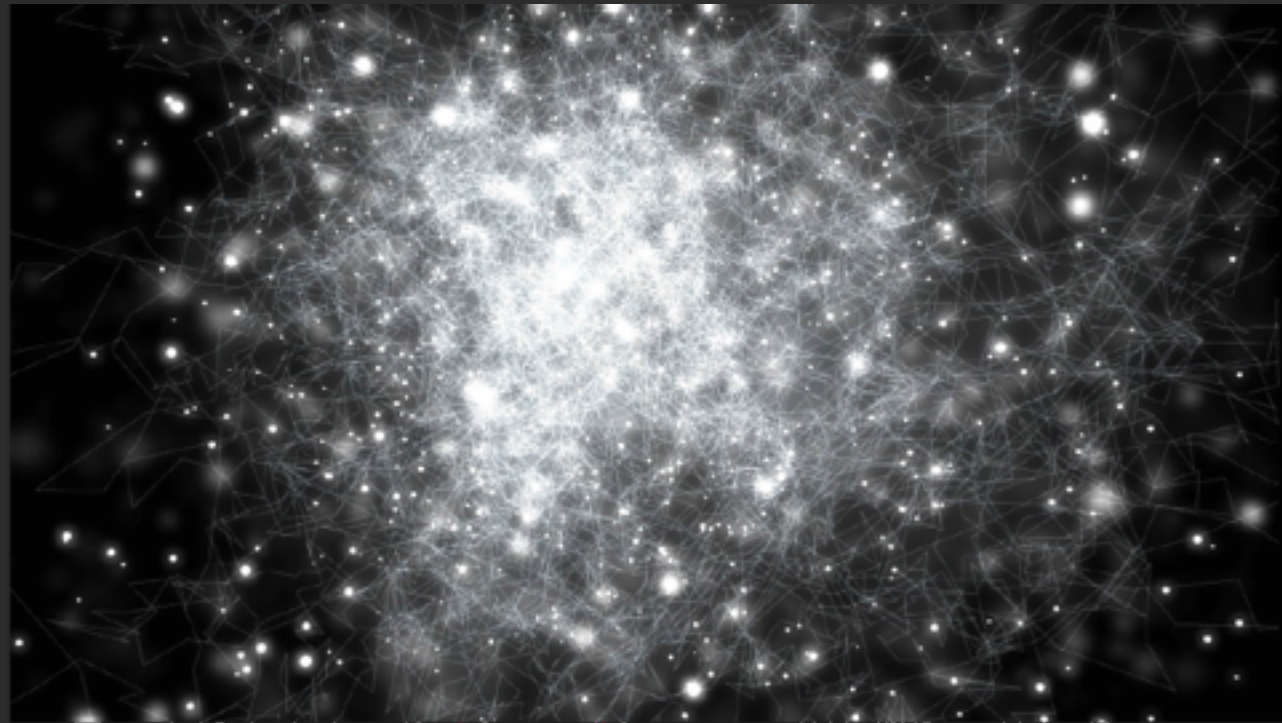
Version de **concert** pour :

- une soprano
- neuf instruments (*fl, cl, trb, perc, pno, guit, vln, vla et vlc*)
- 1 dispositif électroacoustique
- 1 dispositif de vidéo générative

Version **d'installation** interactive, accès non linéaire à la narration (partition interactive)

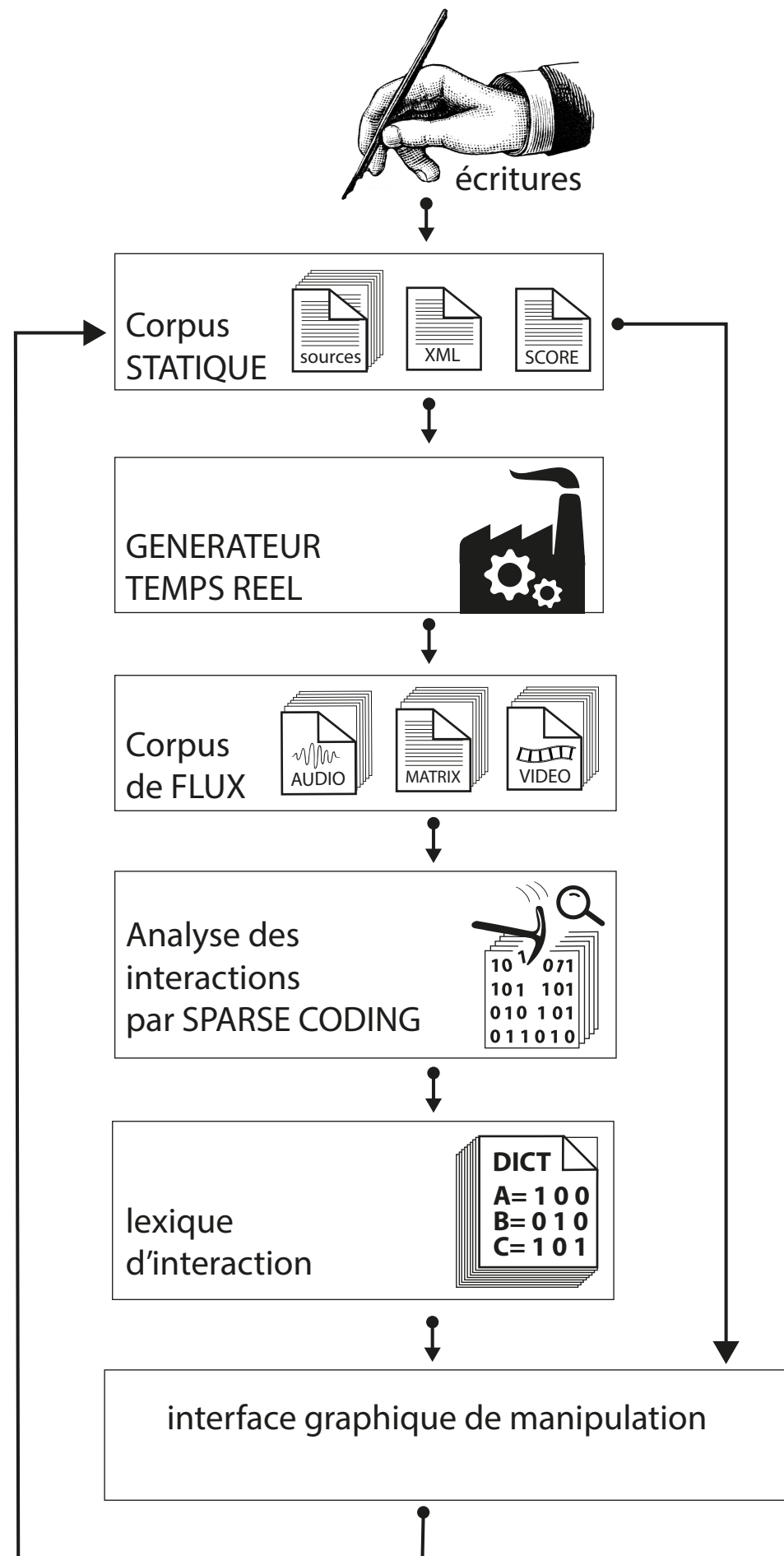
Synoptique logiciel des dispositifs électroniques audio et vidéo





2 à 22k particules vidéo 3d générées en temps réel

cadre de l'étude



♩=70

Fl. *mf* *ff* *mp* *ff* *mp* *ff* *mp* *mf* *3* *5* *3*

Cl. *mp* *ff* *ff* *mp* *mf* *5*

Trb. *p* *f* *mp* *f* *p* *f* *p*

Voix *mp* *f* *p*
de- dans

Vib. *ff* *f*

P. *ff* *mf* *ff* *f* *3* *mp* *f*

Gtr. E *ff* *f* *mp* *crunch* *f* *n*

Vln. *p* *f* *p* *mp* *5* *3*

Vla. *p* *f* *p* *mp* *5* *3*

Vc. *p* *f* *p* *fff* *p*

Electro 77 [27] 28

1 gr. delay
perc. pno. guit.

2 gr. reverse & delay
fl. cl. / vln. vla.

rall. ♩=50 accel.

Fl. *p* *3* *3* *3*

Cl. *p* *3*

Trb. *p* *f* *pp* *mp*

Voix *mf* *f* *pp* *mf* *f* *ppp* *mf* *f*
Un rien où tout ce qui ar - ri - - ve est

Vib. *mf* *mp* *3* *p* *5* *3* *3*

P. *mf* *3* *mp* *5* *p* *3* *5*

Gtr. E *mf* *n* *p* *5* *3* *5*

Vln. *p* *mf* *p* *arco* *p* *3*

Vla. *p* *mf* *p* *arco* *p* *3* *5*

Vc. *ppp* *p* *ppp*

Electro 80

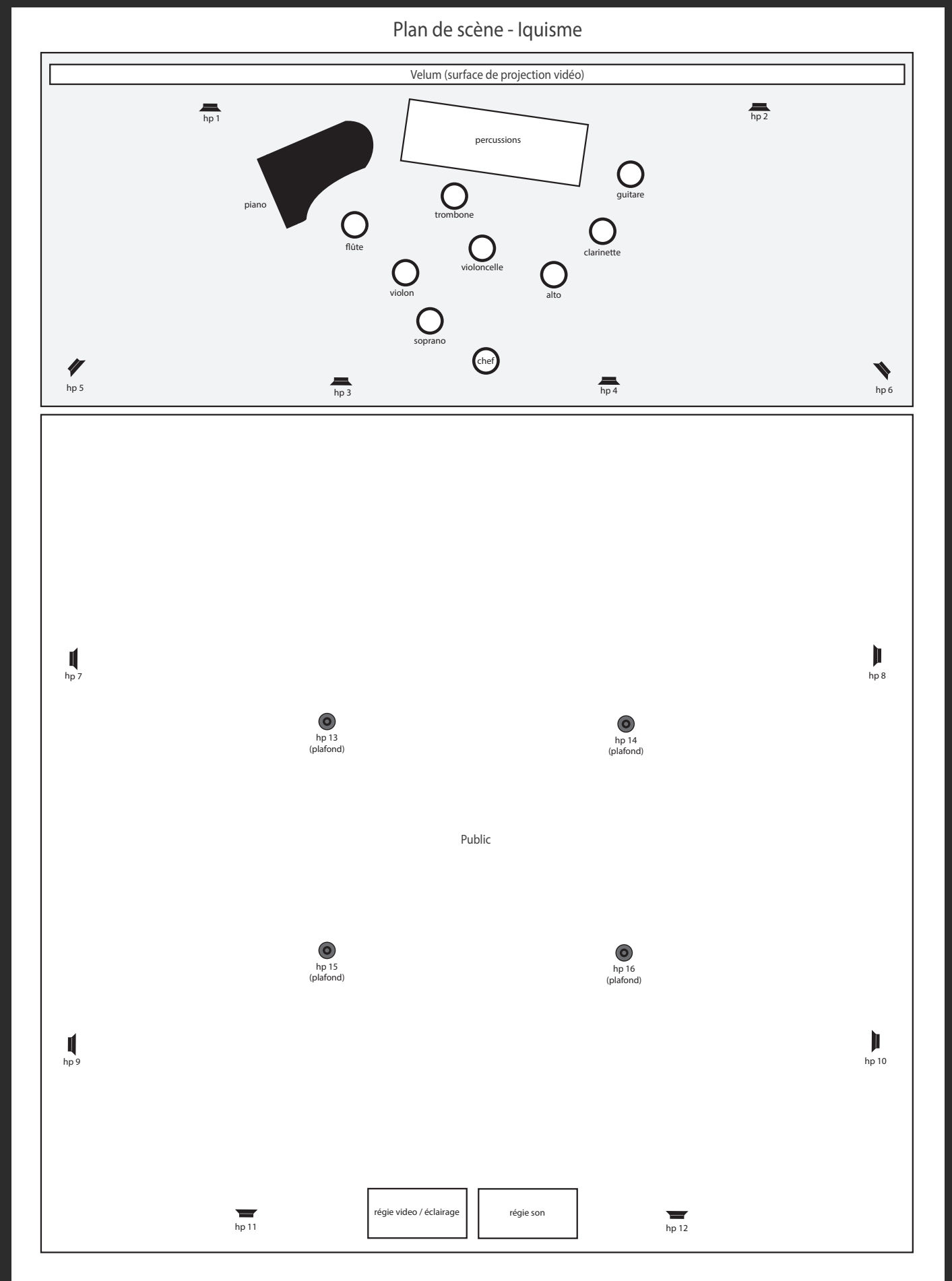


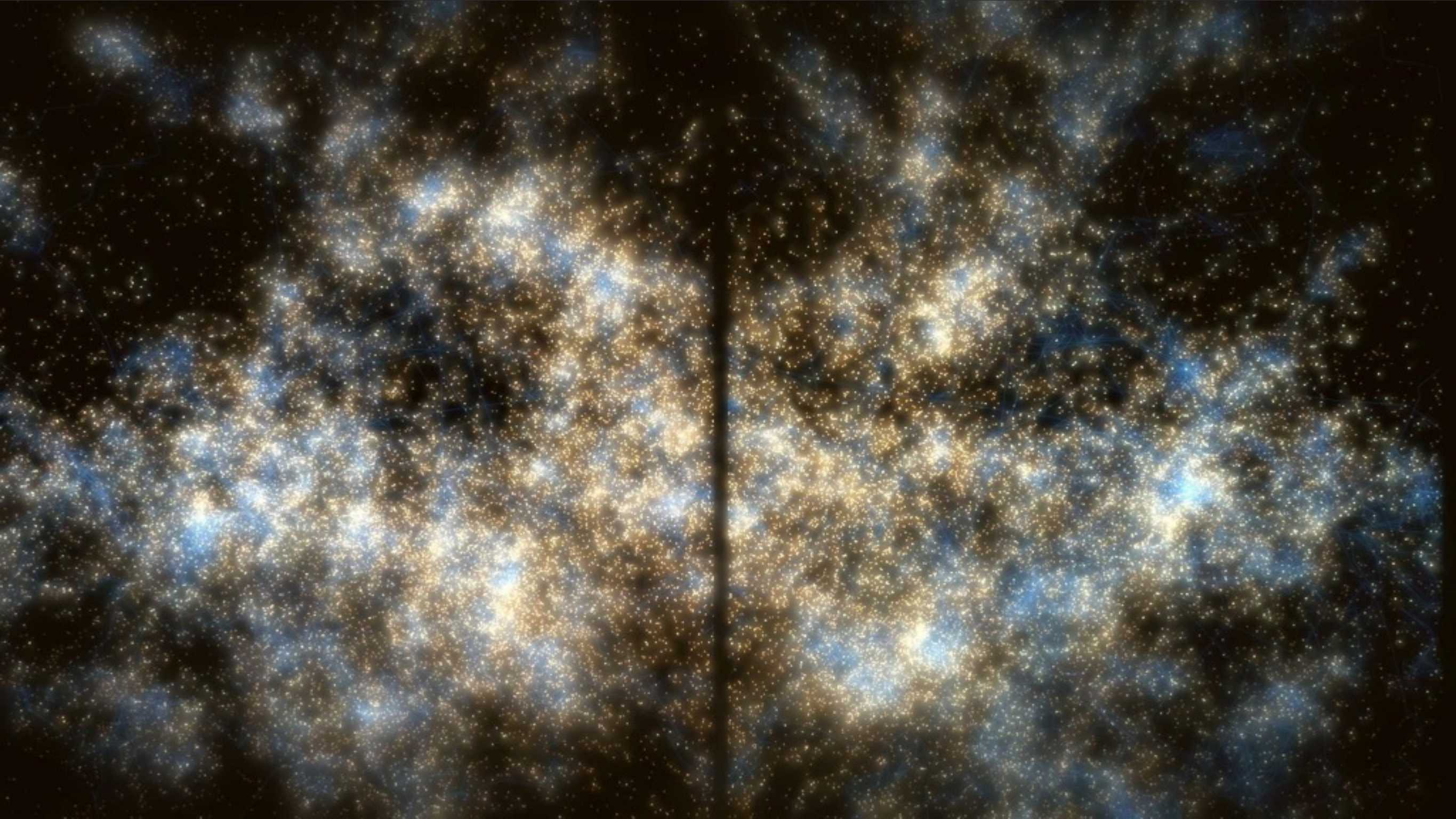
```
1 {
2   "pattrstorage" : {
3     "name" : "2-MEMORY",
4     "slots" : {
5       "1" : {
6         "id" : 1,
7         "name" : "M121---8-14-18H",
8         "data" : {
9           "blend-mode" : [ 1 ],
10          "draw-mode-mesh" : [ "points" ],
11          "enable-point" : [ 1 ],
12          "ligh-enable" : [ 0 ],
13          "turn-around" : [ "z" ],
14          "view-center" : [ 0 ],
15          "rotx::rotx" : [ 0.0 ],
16          "roty::roty" : [ 0.0 ],
17          "rotz::rotz" : [ -5.0 ],
18          "slope::slope" : [ 0.282051 ],
19          "scale::scale" : [ 0.0 ],
20          "xfade-1-2::xfade" : [ 1.0 ],
21          "xfade-2-3::xfade" : [ 0.0 ],
22          "xfade-3-4::xfade" : [ 0.0 ],
23          "scale-z::scaleZ" : [ 1.0 ],
24          "scale-y::scaleY" : [ 1.2 ],
25          "scale-x::scaleX" : [ 1.0 ],
26          "speed-turn-center::speed-turn-center" : [ 6.0 ],
27          "distance-center::distance-center" : [ 2.0 ],
28          "slide-mesh::slide-mesh" : [ 10 ],
29          "CAMERA_MAP_PATH::scale" : [ 100.0 ],
30          "CAMERA_MAP_PATH::slide" : [ 40 ],
31          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::random-order" : [ 0 ],
32          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::random-speed" : [ 2 ],
33          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::hauteur" : [ 100.0 ],
34          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cadre" : [ 100.0 ],
35          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::random-mode" : [ 0 ],
36          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::balai" : [ 0.0 ],
37          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::max-zoom" : [ 0.0 ],
38          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::noise-on" : [ 0 ],
39          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::noise-amount" : [ 0.0 ],
40          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::deviation" : [ 0.0 ],
41          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-1:1-offset-path" : [ 0.0 ],
42          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-1:1-inv" : [ 0 ],
43          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-1:1-mode-change-order" : [ 1 ],
44          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-2:2-offset-path" : [ 0.0 ],
45          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-2:2-inv" : [ 0 ],
46          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-2:2-mode-change-order" : [ 1 ],
47          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-3:3-offset-path" : [ 0.0 ],
48          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-3:3-inv" : [ 0 ],
49          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-3:3-mode-change-order" : [ 1 ],
50          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-4:4-offset-path" : [ 0.0 ],
51          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-4:4-inv" : [ 0 ],
52          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-4:4-mode-change-order" : [ 1 ],
53          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-5:5-offset-path" : [ 0.0 ],
54          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-5:5-inv" : [ 0 ],
55          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-5:5-mode-change-order" : [ 1 ],
56          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-6:6-offset-path" : [ 0.0 ],
57          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::cam-6:6-inv" : [ 0 ],
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59          "CAMERA_MAP_PATH::MODULE-MULTIPLE-CAM::flonum[3]" : [ ],
60          "CAMERA_MAP_PATH::macro::number" : [ ],
61          "CAMERA_MAP_PATH::macro::textbutton[1]" : [ ],
62          "CAMERA_MAP_PATH::macro::time" : [ 100000 ],
63          "CAMERA_MAP_PATH::macro::nbpreset" : [ 1 ],
64          "CAMERA_MAP_PATH::macro::ONOFF" : [ 1 ],
65          "CAMERA_MAP_PATH::Lens-angle" : [ 35.0 ],
66          "CAMERA_MAP_PATH::background" : [ 0 ],
67          "CAMERA_MAP_PATH::flonum[4]" : [ ],
68          "CAMERA_MAP_PATH::lookat-follow-matrix" : [ 0 ],
69          "CAMERA_MAP_PATH::lookat-id-follow" : [ 0 ],
70          "CAMERA_MAP_PATH::lookat-x" : [ 0.0 ],
71          "CAMERA_MAP_PATH::lookat-y" : [ 0.0 ],
```

traitements sonores et génération vidéo
en temps réel

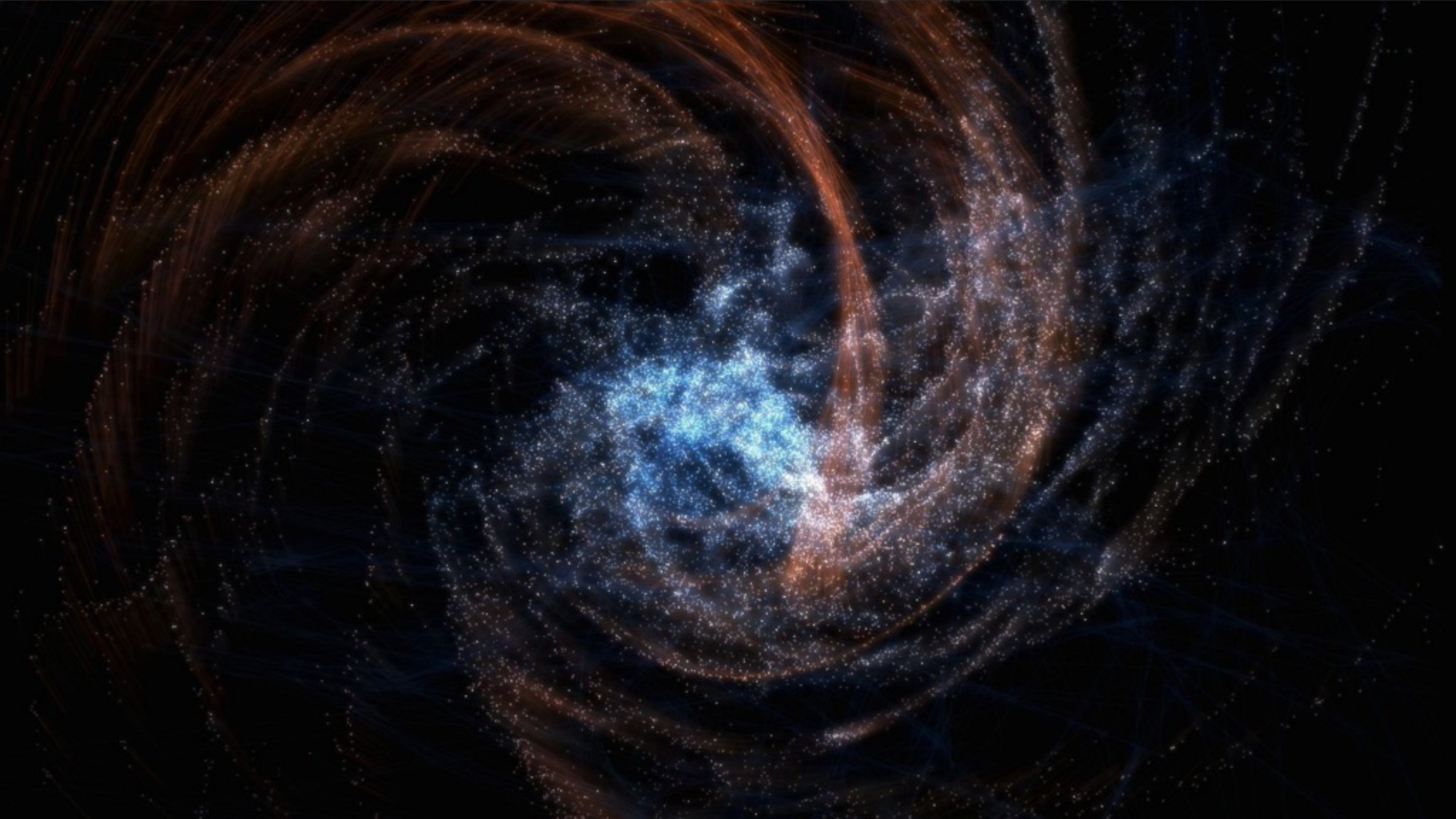
diffusion sonore ambisonique

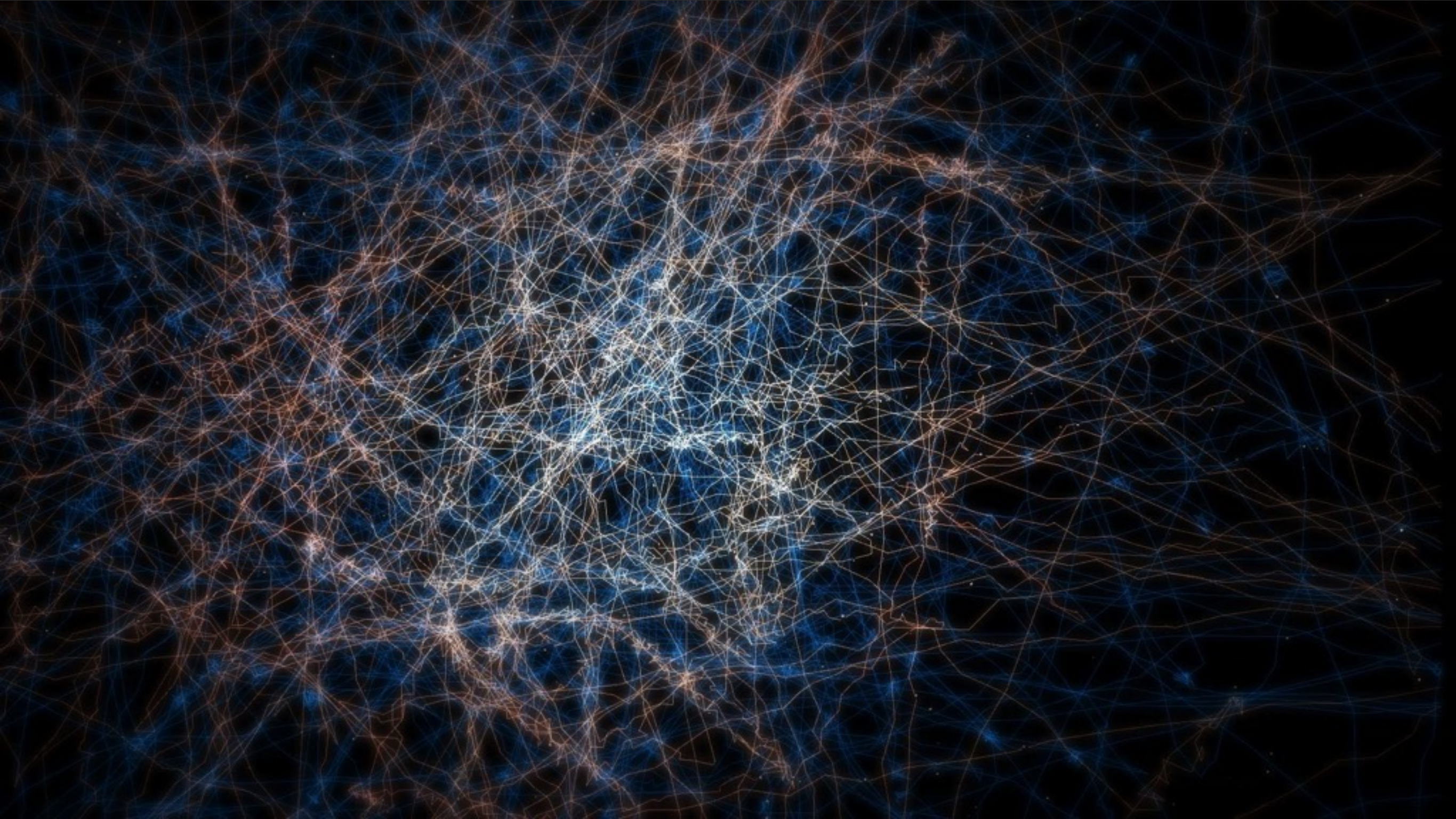
vidéoprojection 4k













Interface de contrôle audio

APP-INTERFACE-AUDIO (presentation)

1_ perc pno guit
reverse 1
automation ON copy paste
BBBAAA.iqpreset SAVE
5 Reverse ON
0 empty ON
0 empty ON
0 empty ON
display big
time : 2400
circle_reverse_iq.pan SAVE REC
Index L 0.25 %
distance R 50.0 %
ON
vol -6.24
reverb -70. near -70. far

2_ perc pno guit
reverse 2
automation ON copy paste
BBBAAA.iqpreset SAVE
5 Reverse ON
2 Disto ON
4 RingMod ON
7 Resynthese ON
display big
time : 2400
circle_iq.pan SAVE REC
Index L 0.38 %
distance R 50.0 %
ON
vol -6.24
reverb -70. near -70. far

3_ fl cl trb vln vla vlc
granu-reverse
automation ON copy paste
BBBAAA.iqpreset SAVE
3 Delay ON
0 empty ON
0 empty ON
0 empty ON
display big
robo-avant_iq.pan SAVE REC
Index L 0.30 %
distance R 0.50 %
ON
vol -6.60
reverb -70. near 0. far

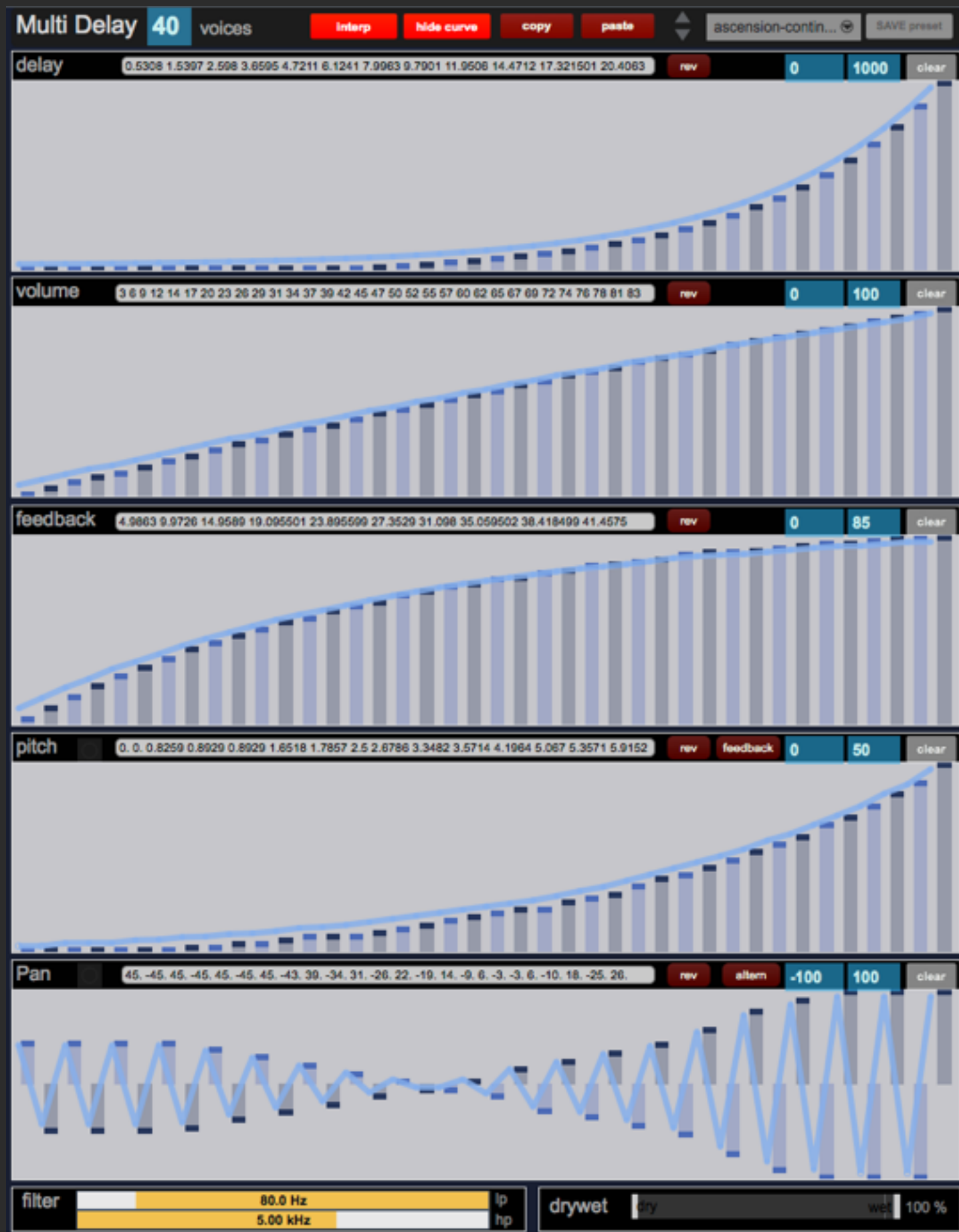
4_
harmoniser
automation ON copy paste
BBBAAA.iqpreset SAVE
3 Delay ON
0 empty ON
0 empty ON
0 empty ON
display big
robo-avant_iq.pan SAVE REC
Index L 0.30 %
distance R 0.50 %
ON
vol 0. near -70. far

STOP open
1-SAMPLE-CRAQUEMEN...
Player 1
0:00:01:695 0:00:06:112
STOP open
1-SAMPLE-CRAQUEMEN...
Player 2
0:00:01:695 0:00:06:112
front back left right
1 2 3 4
yaw pitch roll
2. 1. 5.
manuel

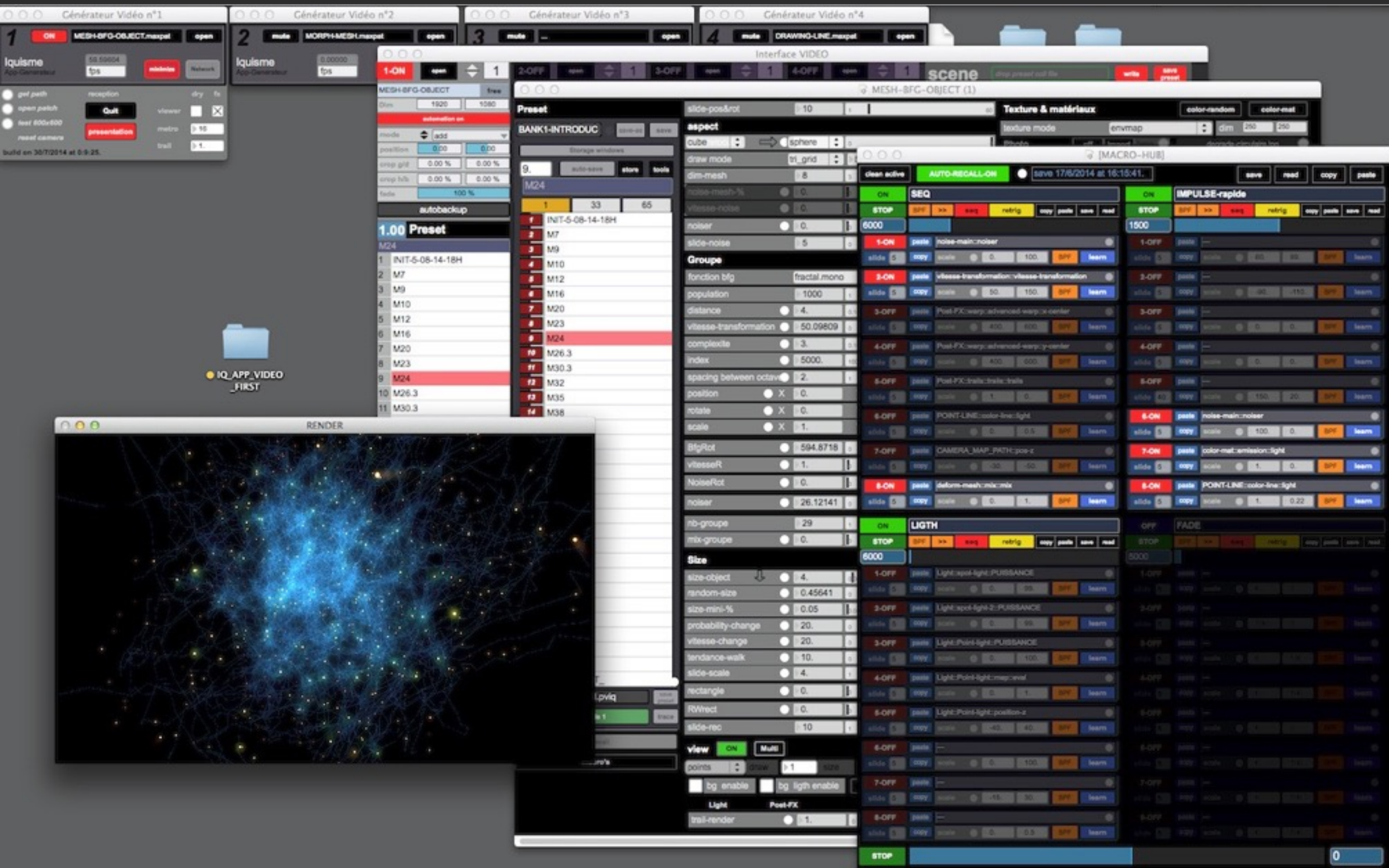
lquisme AUDIO INTERFACE
fl. clar. trb. perc. piano guit. vln. vla. vlc. voix
groupe 1
groupe 2
groupe 3
groupe 4
scene drop preset coil file tools write save preset
AUDIO_SYNCHRO_VIDEO-1_iq.json
66 66 STORE
store mes.137_bpm.70-delay&reverse
53 (undefined)
54 (undefined)
55 (undefined)
56 (undefined)
57 (undefined)
58 (undefined)
59 (undefined)
60 mes.123_bpm.60-delay-ON
61 mes.127_bpm.80-DRY
62 mes.137_bpm.70-delay&reverse
63 mes.137_bpm.70-delay&reverse
64 mes.137_bpm.70-delay&reverse
65 mes.137_bpm.70-delay&reverse
66 mes.137_bpm.70-delay&reverse
control by remote on

load App
INIT
Draw SPAT
Fullscreen
Input-mix
Analyseurs
Network
save setup
presentation X
lquisme Interface Audio
V3 build on 17/8/2014 at
20:59:12.
recall fx
changemode
AUDIO OFF
live dry near far ALL

Multi Delay



Interface de contrôle vidéo



Preset

BANK1-INTRODUC save-as save

Storage windows

1. auto-save store tools

M43.3

1 33 65

1	INIT-5-08-14-18H
2	M7
3	M9
4	M10
5	M12
6	M16
7	M20
8	M23
9	M24
10	M26.3
11	M30.3
12	M32
13	M35
14	M38
15	M42
16	M43.3
17	M47
18	M52
19	M54
20	M58
21	M60
22	M62
23	M64.4
24	M70.4
25	M78
26	M84
27	M86
28	M87
29	M89
30	M91
31	M93
32	M95.1-SPLIT_

alpha-blend.pviq save preset

changemode 1 trace

forcecall

macro's

slide-pos&rot 10 1 60

aspect

cube etocul sphere 0

draw mode tri_grid 5 taille du point

dim-mesh 5 3 40

noise-mesh-% 0. 1

vitesse-noise 0. 100

noiser 0. 100

slide-noise 5 0 20

Groupe

fonction bfg fractal.mono

population 1000 1 10000

distance 2. 0.10 10

vitesse-transformation 20. 0 100

complexite 3. 0.10 4

index 5000. 100 45000

spacing between octaves 2. 1 5

position X 0. Y 0. Z 0.

rotate X 0. Y 0. Z 0.

scale X 1. Y 1. Z 2.

BfgRot 594.87183 0 1000

vitesseR 1. 100

NoiseRot 0. 1

noiser 100. 0 100

nb-groupe 29 1 40

mix-groupe 0. 1

Size

size-object 1. 0.00 100

random-size 1. 0

size-mini-% 0.05 0.05 100

probability-change 20. 0 100

vitesse-change 20. 0 10

tendance-walk 40. 0 100

slide-scale 4. 1

rectangle 0. 1

RWrect 0. 1

slide-rec 10 1 40

view ON Multi

points draw 1 size X light alpha_blend / add

bg enable bg ligh enable fx-bg BG-feedback

Light Post-FX Interactions

trail-render 1. 0

Texture & matériaux color-random color-mat

texture mode envmap dim 250 250

Photo off import bang degrade-circulaire.jpg

feedback to source normal

mix-texture-fond 1. 0

RW-color 0. 1

proportion-col 0. 100

slide-color 10 1 40

randomAlpha 50. 0 100

randomLight 50. 0 100

color-Black-White 1. 0

mix-color 0. 1

obj 3d off bang open BUISSON-center.obj

dim original 19872 out 900 sampling % 100 Dim output 30

xfade 0. 1

Deform Mesh

scale 1. 0.00 5

slope 0.5 -1 2

rotx -1. 1

roty -1. 1

rotz 1. -1

scaleX 1. 0.00 2

scaleY 1. 0 2

scaleZ 1. 0 2

center X 0. Y 0. Z 0.

speed-turn-center 0. -1 1

distance-center 0.2 0.00 2

mix 0. 0.00 1

Camera manual editeur mira

POS 0. 0. -15.

LOOK 0. 0. 0.

slide 5 Lens 35.

nb cam 1 % scale 100.

SEQ eval 0.025

OFF preset -1 count

50000

position follow OFF 0 id

lookat follow OFF 0 id

save read copy paste

dessus dessous droite gauche derriere centre face

notes

point-line

point-node

point-Nurb

RANDOM-LIGHT.

RANDOM-LIGHT.

POINT-SPLINE

FPRINT

Macro BPF

Preset

BANK1-INTRODUC

Storage windows

4.

auto-save

store

tools

M10

1

33

65

1

INIT-5-08-14-18H

2

M7

3

M9

4

M10

5

M12

6

M16

7

M20

8

M23

9

M24

10

M26.3

11

M30.3

12

M32

13

M35

14

M38

15

M42

16

M43.3

17

M47

18

M52

19

M54

20

M58

21

M60

22

M62

23

M64.4

24

M70.4

25

M78

26

M84

27

M86

28

M87

29

M89

30

M91

31

M93

32

M95.1-SPLIT_

alpha-blend.pviq

save preset

changemode 1

trace

forcedall

macro's

slide-pos&rot

44

1

80

aspect

cube

sphere

0

draw mode

tri_grid

5

taille du point

dim-mesh

0

3

40

noise-mesh-%

0.

1

vitesse-noise

0.

100

noiser

0.

100

slide-noise

5

0

20

Groupe

fonction bfg

fractal.mono

population

1000

1

10000

distance

3.229266

0.10

10

vitesse-transformation

85.803988

0

100

complexite

3.

0.10

4

index

5000.

100

45000

spacing between octaves

2.

1

5

position

X

0.

Y

0.

Z

0.

rotate

X

0.

Y

0.

Z

0.

scale

X

1.

Y

1.

Z

2.

Texture & matériaux

texture mode

envmap

dim

250

250

Photo

off

import

bang

degrade-circulaire.jpg

feedback to source

norm

mix-texture-fond

1.

RW-color

0.

proportion-cool

0.

slide-color

10

randomAlpha

50.

randomLight

50.

color-Black-White

1.

mix-color

0.

obj 3d

off

bang

dim original 19872

out 900

sampled 19872

xfade

0.

Deform Mesh

scale

2.

slope

0.

clean active

AUTO-RECALL-ON

save 17/8/2014 at 16:15:41.

save

read

copy

paste

ON

SEQ

STOP

BPF

>>

seq

retrig

copy

paste

save

read

4000

1-OFF

paste

color-mat:emission:light

slide 5

copy

scale

0.

0.5

BPF

learn

2-ON

paste

vitesse-transformation:vitesse-transformation

slide 5

copy

scale

200.

60.

BPF

learn

3-ON

paste

deform-mesh:mbc:mix

slide 5

copy

scale

0.

1.

BPF

learn

4-OFF

paste

—

slide 5

copy

scale

0.

360.

BPF

learn

5-OFF

paste

—

slide 5

copy

scale

-15.

30.

BPF

learn

ON

IMPULSE-rapide

STOP

BPF

>>

seq

retrig

copy

paste

save

read

4000

1-OFF

paste

—

slide 5

copy

scale

60.

90.

BPF

learn

2-OFF

paste

—

slide 5

copy

scale

-90.

-110.

BPF

learn

3-OFF

paste

—

slide 5

copy

scale

0.

0.

BPF

learn

4-ON

paste

distance:distance

slide 5

copy

scale

6.

2.

BPF

learn

5-ON

paste

POINT-LINE:color-line:hue

slide 40

copy

scale

50.

0.

BPF

learn

6-ON

paste

noise-main:noiser

slide 5

copy

scale

50.

0.

BPF

learn

7-ON

paste

color-mat:emission:light

slide 5

copy

scale

0.2

0.

BPF

learn

8-ON

paste

POINT-LINE:color-line:light

slide 5

copy

scale

1.

0.05

BPF

learn

ON

FADE

STOP

BPF

>>

seq

retrig

copy

paste

save

read

5000

1-ON

paste

POINT-LINE:slide-line:slide-line

slide 5

copy

scale

10.

100.

BPF

learn

2-ON

paste

slide-pos&rot:slide-pos&rot

slide 5

copy

scale

5.

100.

BPF

learn

3-OFF

paste

—

slide 5

copy

scale

0.

100.

BPF

learn

4-OFF

paste

—

slide 5

copy

scale

0.

100.

BPF

learn

5-OFF

paste

—

slide 5

copy

scale

0.

0.

BPF

learn

6-OFF

paste

—

slide 5

copy

scale

0.

100.

BPF

learn

7-OFF

paste

—

slide 5

copy

scale

0.

100.

BPF

learn

8-OFF

paste

—

slide 5

copy

scale

0.

100.

BPF

learn

STOP

0

100%

2

Curve

0

offset

1

0.00

0.00

0.00

2

100.00

100.00

-0.60

copy

paste

clear

POS

0.

0.

LOOK

0.

0.

slide

5

Lens

nb cam

1

% scale

seq

off

preset

-1

50000

position

follow OFF

lookat

follow OFF

save

read

copy

paste

view

ON

Multi

points

draw

1

size

X

light

alpha_blend / add

bg enable

bg ligh enable

fx-bg

BG-feedback

Light

Post-FX

Interactions

trail-render

1.

0

frame audio

3902-F_ 19 -mes 46_bpm 60-all _19882-T.csv																							Ouvrir avec Microsoft Excel
15.3525	0.8656	1.9162	1582.8634	0.0864	0.1612	0.1829	2353.7188	2315.3733	0.0577	-0.0000	2831.6162	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3.9198	1.8620	3.9593	5.9354	3.2587	6.2185	0.1920	0.7082	3.4809	4.2054	1.6164	0.4228	1.4777	2.5964	1.1299	1.0587	0.6529	0.4538	0.2279	0.1535	0.1216	0.1596	0.0340	0.0038
-2.1616	6.5428	-2.8251	2.6367	-0.6858	0.5405	-1.1331	-0.0750	-2.2132	0.7205	0.7561	2.2856	-0.5821	-0.5580	-0.5771	0.4264	0.1276	0.5560	1.0825	0.6687	-0.1879	-0.7489	-0.4360	-0.4631
3.9198	1.8620	3.9593	5.9354	3.2587	6.2185	0.1920	0.7082	3.4809	4.2054	1.6164	0.4228	1.4777	2.5964	1.1299	1.0587	0.6529	0.4538	0.2279	0.1535	0.1216	0.1596	0.0340	0.0038

Ligne N°1

12 descripteurs Audio : Loudness, Spread, Sharpness, FundamentalFrequency, HarmonicEnergy, NoiseEnergy, TotalEnergy, SpectralCentroid, SpectralSpread, SpectralVariation, SpectralSlope, SpectralRolloff,

Ligne N°2

MEL en 24 bandes

Ligne N°3

MFFC en 24 bandes

Ligne N°3

Energy MEL en 24 bandes

G. Peeters, *A large set of audio features for sound description (similarity and classification) Cuidado projet report*, (IRCAM), 2004

M. Malt M. & E. Jourdan, *Zsa.descriptors: a library for real-time descriptors analysis*. SMC 2008

frame vidéo

1 colonne par dimension (14)
1 ligne par particule

Espace produit

3 (position XYZ),
3 (diff-1 position XYZ),
4 (couleur RGBA),

Espace perçu

2 (Centroid screen XY),
1 (intensité lumière)
1 (différence -1)

3902-F_BANK1-INTRODUCTION|json-B_|1|-M52-P_8-T.csv

Ouvrir avec Microsoft Excel

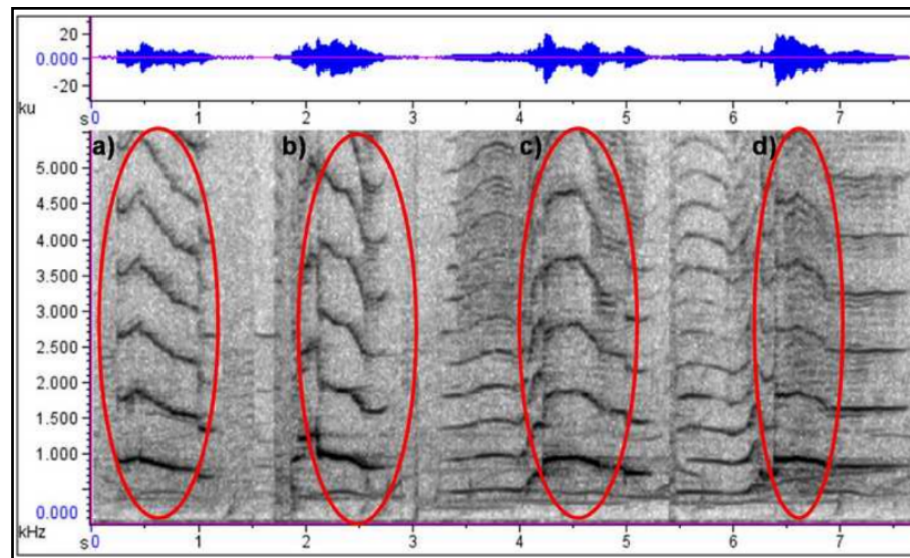
-2.7829	-0.8202	3.9347	0.1337	0.0372	-0.1825	0.5582	0.2989	0.3637	0.8888	48.6528	48.0344	0.0040	0.3966
-0.9969	0.1615	4.2016	0.0486	-0.0121	-0.1904	0.3039	0.4262	0.6300	0.8559	48.6528	48.0344	0.0040	0.3966
-0.2174	-1.3272	-0.7828	0.0079	0.0621	0.0368	0.4966	0.2659	0.3236	0.9902	48.6528	48.0344	0.0040	0.3966
0.6022	-0.7759	2.7992	-0.0300	0.0336	-0.1272	0.2894	0.4574	0.6075	0.9735	48.6528	48.0344	0.0040	0.3966
-0.7371	-0.6754	3.4412	0.0337	0.0281	-0.1593	0.3708	0.4364	0.4265	0.8623	48.6528	48.0344	0.0040	0.3966
-2.2472	-1.2523	-0.4929	0.1025	0.0596	0.0241	0.2589	0.4091	0.5434	0.8383	48.6528	48.0344	0.0040	0.3966
0.3170	0.0037	4.0593	-0.0171	-0.0059	-0.1800	0.2706	0.3795	0.5611	0.9581	48.6528	48.0344	0.0040	0.3966
-3.4896	-1.3451	3.9068	0.1658	0.0605	-0.1747	0.6900	0.2300	0.2300	0.9034	48.6528	48.0344	0.0040	0.3966
-0.4435	-0.5501	3.7744	0.0227	0.0225	-0.1776	0.7572	0.6188	0.2402	0.9808	48.6528	48.0344	0.0040	0.3966
-0.6897	-0.5378	3.4298	0.0356	0.0201	-0.1672	0.4772	0.4550	0.3034	0.8719	48.6528	48.0344	0.0040	0.3966
-1.5033	0.5900	2.2148	0.0698	-0.0292	-0.1030	0.7273	0.2424	0.2424	0.8834	48.6528	48.0344	0.0040	0.3966
1.6790	0.1574	2.0246	-0.0765	-0.0086	-0.0958	0.2792	0.3916	0.5789	0.9470	48.6528	48.0344	0.0040	0.3966
-0.6736	-1.2389	-0.0458	0.0333	0.0598	-0.0074	0.2745	0.3850	0.5691	0.8693	48.6528	48.0344	0.0040	0.3966
2.1276	-1.4311	3.5452	-0.1006	0.0661	-0.1627	0.4512	0.5311	0.5191	0.8318	48.6528	48.0344	0.0040	0.3966
2.0902	0.2469	-2.6961	-0.0962	-0.0116	0.1318	0.4048	0.4765	0.4658	0.8913	48.6528	48.0344	0.0040	0.3966
-0.6391	0.1931	1.2395	0.0345	-0.0083	-0.0615	0.3880	0.3266	0.4430	0.9794	48.6528	48.0344	0.0040	0.3966
2.4031	0.5288	1.9804	-0.1079	-0.0246	-0.0969	0.3693	0.4347	0.4249	0.9028	48.6528	48.0344	0.0040	0.3966
2.4384	-0.9673	3.4304	-0.1118	0.0432	-0.1620	0.6199	0.5922	0.4021	0.8430	48.6528	48.0344	0.0040	0.3966
1.9796	-0.6729	5.4367	-0.0887	0.0259	-0.2431	0.6907	0.5644	0.2191	0.8567	48.6528	48.0344	0.0040	0.3966
2.0425	-0.6501	1.9120	-0.0939	0.0283	-0.0848	0.7595	0.6209	0.2418	0.8756	48.6528	48.0344	0.0040	0.3966
2.4373	-3.6661	3.8842	-0.1119	0.1679	-0.1821	0.5552	0.2973	0.3618	0.9563	48.6528	48.0344	0.0040	0.3966
1.7858	-1.2233	0.4827	-0.0823	0.0569	-0.0201	0.2496	0.3500	0.5174	0.7804	48.6528	48.0344	0.0040	0.3966
2.1668	-0.6593	0.5633	-0.1006	0.0246	-0.0150	0.6875	0.2292	0.2292	0.9047	48.6528	48.0344	0.0040	0.3966
2.5045	0.1982	4.4960	-0.1155	-0.0176	-0.1930	0.7023	0.5739	0.2228	0.7606	48.6528	48.0344	0.0040	0.3966
1.2839	0.5077	3.9405	-0.0616	-0.0256	-0.1828	0.2861	0.4012	0.5931	0.9049	48.6528	48.0344	0.0040	0.3966
-0.0177	-1.3777	3.1366	-0.0028	0.0613	-0.1470	0.5321	0.2849	0.3467	0.7692	48.6528	48.0344	0.0040	0.3966
1.5681	1.0286	1.4460	-0.0725	-0.0484	-0.0679	0.3889	0.4578	0.4474	0.9101	48.6528	48.0344	0.0040	0.3966
-0.6944	0.5008	2.4523	0.0299	-0.0264	-0.1090	0.6153	0.5872	0.3948	0.7593	48.6528	48.0344	0.0040	0.3966
1.0950	-0.0370	1.6471	-0.0489	0.0012	-0.0728	0.4844	0.4620	0.3080	0.8734	48.6528	48.0344	0.0040	0.3966
-1.0041	0.9238	2.2423	0.0455	-0.0429	-0.1007	0.3172	0.5013	0.6658	0.9341	48.6528	48.0344	0.0040	0.3966
-0.5590	1.0563	0.2424	0.0250	-0.0537	-0.0055	0.3246	0.4553	0.6730	0.9981	48.6528	48.0344	0.0040	0.3966
0.5748	2.6920	1.2409	-0.0288	-0.1277	-0.0543	0.6497	0.2166	0.2166	0.9968	48.6528	48.0344	0.0040	0.3966
-2.6323	2.1498	2.4553	0.1205	-0.0982	-0.1141	0.7486	0.2495	0.2495	0.9870	48.6528	48.0344	0.0040	0.3966
1.4240	1.3220	-2.1137	-0.0619	-0.0583	0.1055	0.6907	0.2302	0.2302	0.9004	48.6528	48.0344	0.0040	0.3966
-0.6385	2.6284	0.8893	0.0291	-0.1179	-0.0429	0.2575	0.4069	0.5404	0.7935	48.6528	48.0344	0.0040	0.3966

Rencontre avec Hervé Glotin

III. REPRESENTATION DE SIGNAUX DE TYPE VOISEMENTS/ Etat de l'art sur l'étude de chants de baleine à bosse

Caractéristiques des émissions sonores des baleines à bosse

- **Caractéristiques acoustiques :**
 - gémissements, grognements, mugissements
 - gamme de fréquence : entre 100 Hz et 10 kHz
- **Structure des chants :**
 - séquences continues entre 2 silences => unité sonore
 - plusieurs unités sonores => une séquence
 - plusieurs séquences => une phrase
 - plusieurs phrases => un thème de chant
 - variations des chants intra-site
- **Objectifs des études :**
 - rôles de ces chants (hypothèses)
 - comportement social
 - estimation de densité
- **Moyens :**
 - détection segmentation : filtre adapté, corrélation de spectrogramme (Mellinger, Abbot), détection de contours, pitch tracking ...
 - représentation/Classification : LPC, FFT, Cepstres, Kmeans, HMM, SWML...
 - concept de sous unité : unités = combinaisons de sous-unités (Glotin 2008, Pace et al 2009)



Équations fondamentales

- Approche quantification vectorielle (VQ) :

affectation à 1 élément du dictionnaire :

$$d_j = \arg \min \|x_i - d_k\|_2 \quad (eq. 9)$$

problème d'optimisation :

$$\arg \min \sum_{i=1}^N \|x_i - Dc_i\|_2^2 \quad s.t. \|c_i\|_{l_0} = 1, \forall i \quad (eq. 10)$$

- Approche codage parcimonieux (SC) :

problème d'optimisation : $\arg \min \sum_{i=1}^N \|x_i - Dc_i\|_2^2 + \lambda \|c_i\|_{l_1} \quad s.t. \|d_j\|_2 = 1, \forall j \quad (eq. 11)$

reconstruction de l'entrée : $\hat{x} = D.c = \sum_{i=1}^K d_i c_i \quad (eq. 12)$

- Descripteurs

-13 MFCCs

☐ C0 à C12

☐ décalage temporel : 10 ms

☐ fenêtre FFT : 32 ms

- concaténation des vecteurs de 10 ms en 1 super vecteur de 500 ms

☐ taille finale : 13*50=650 avec recouvrement de 250 ms

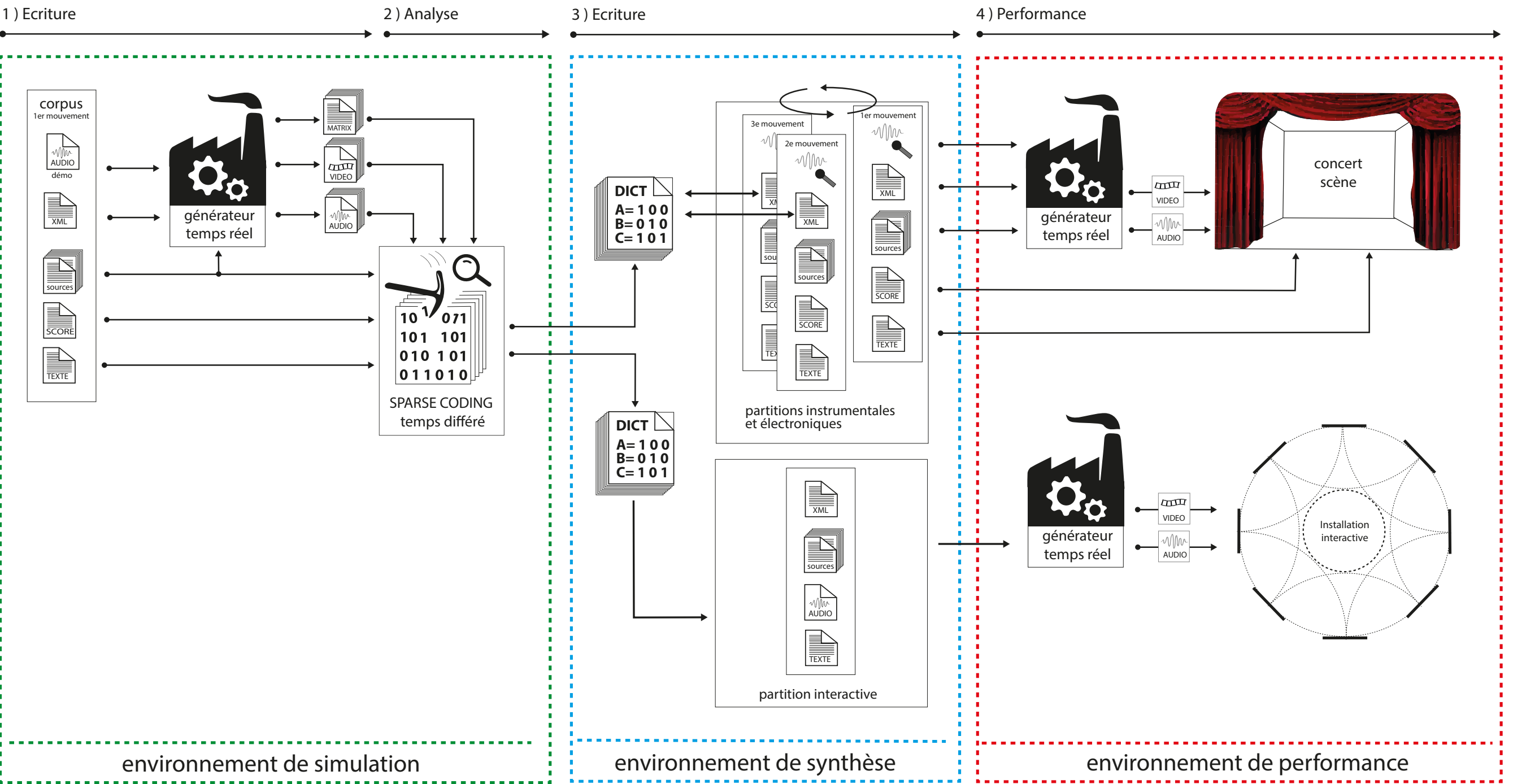
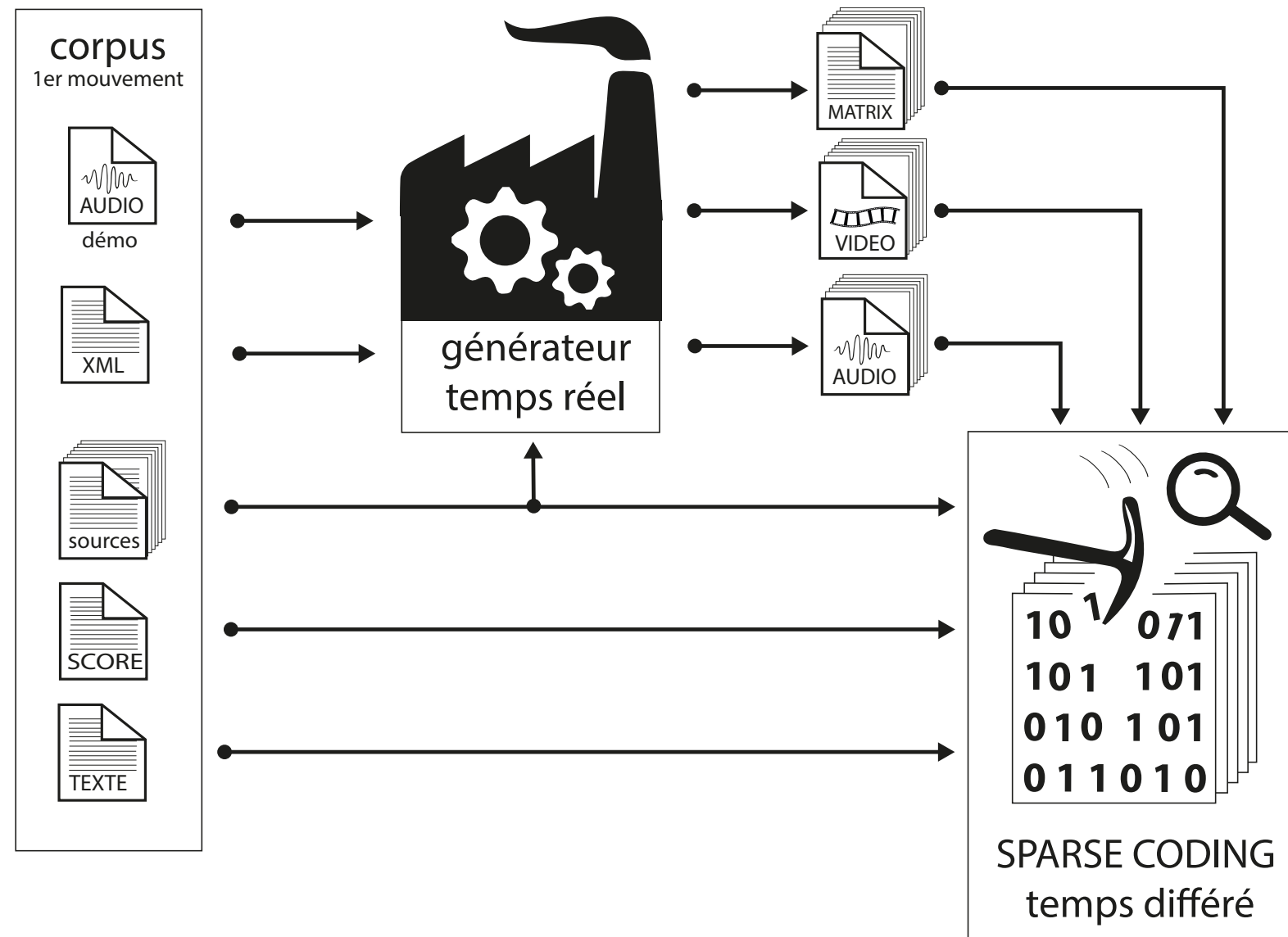
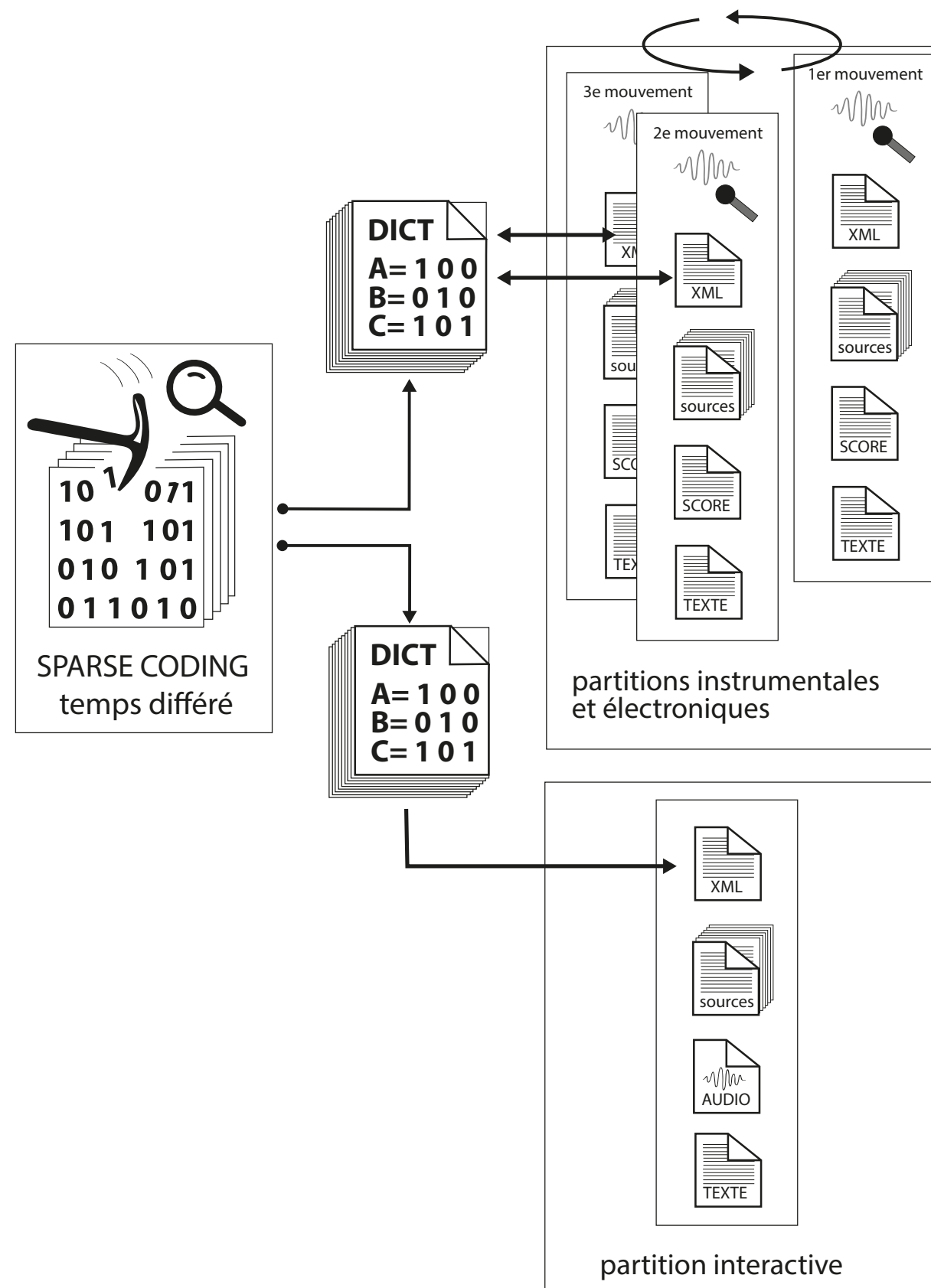


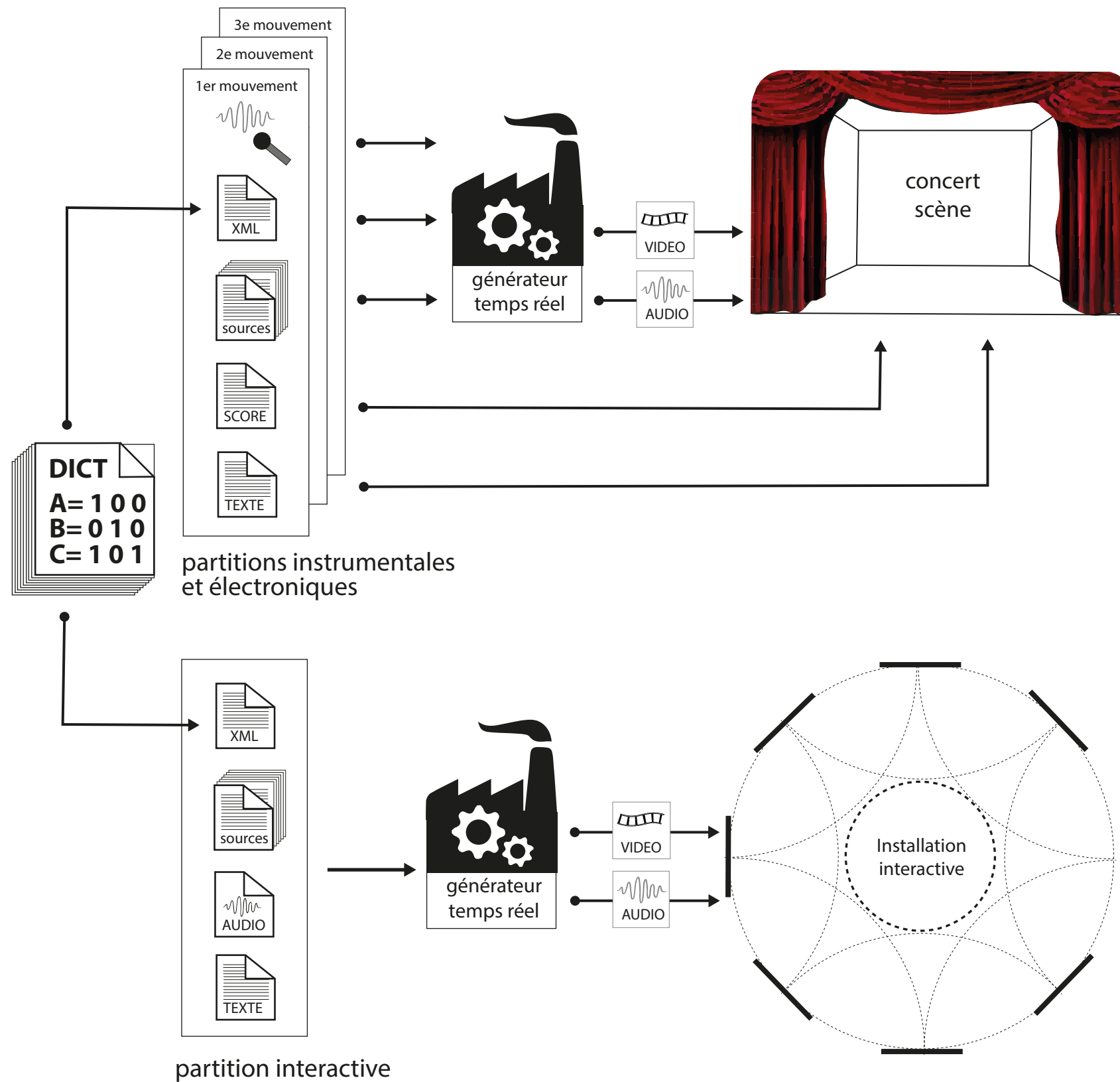
Schéma des différents stades et environnements de réalisation



environnement de simulation

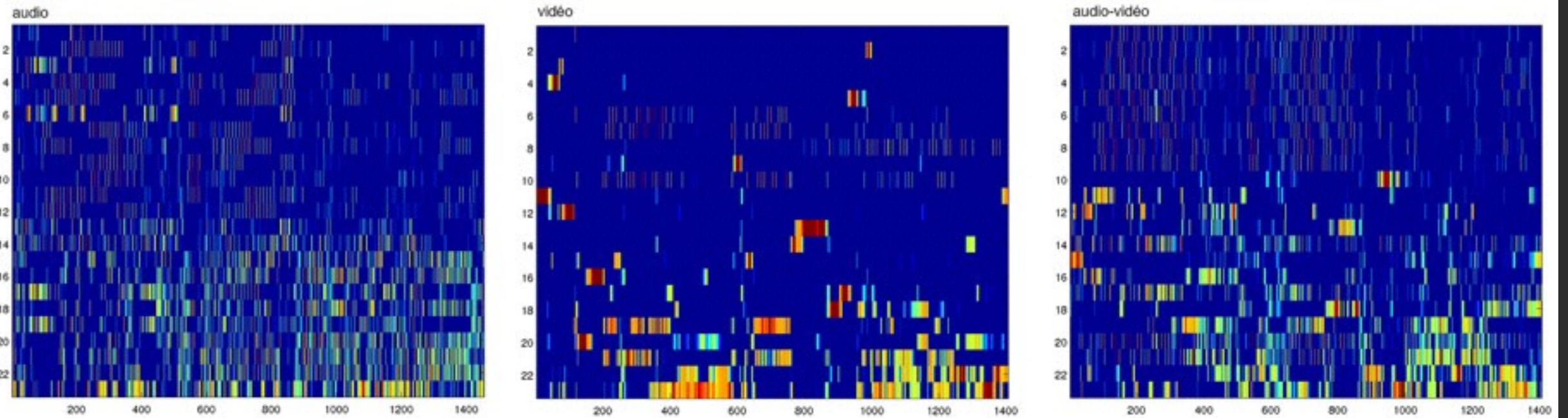


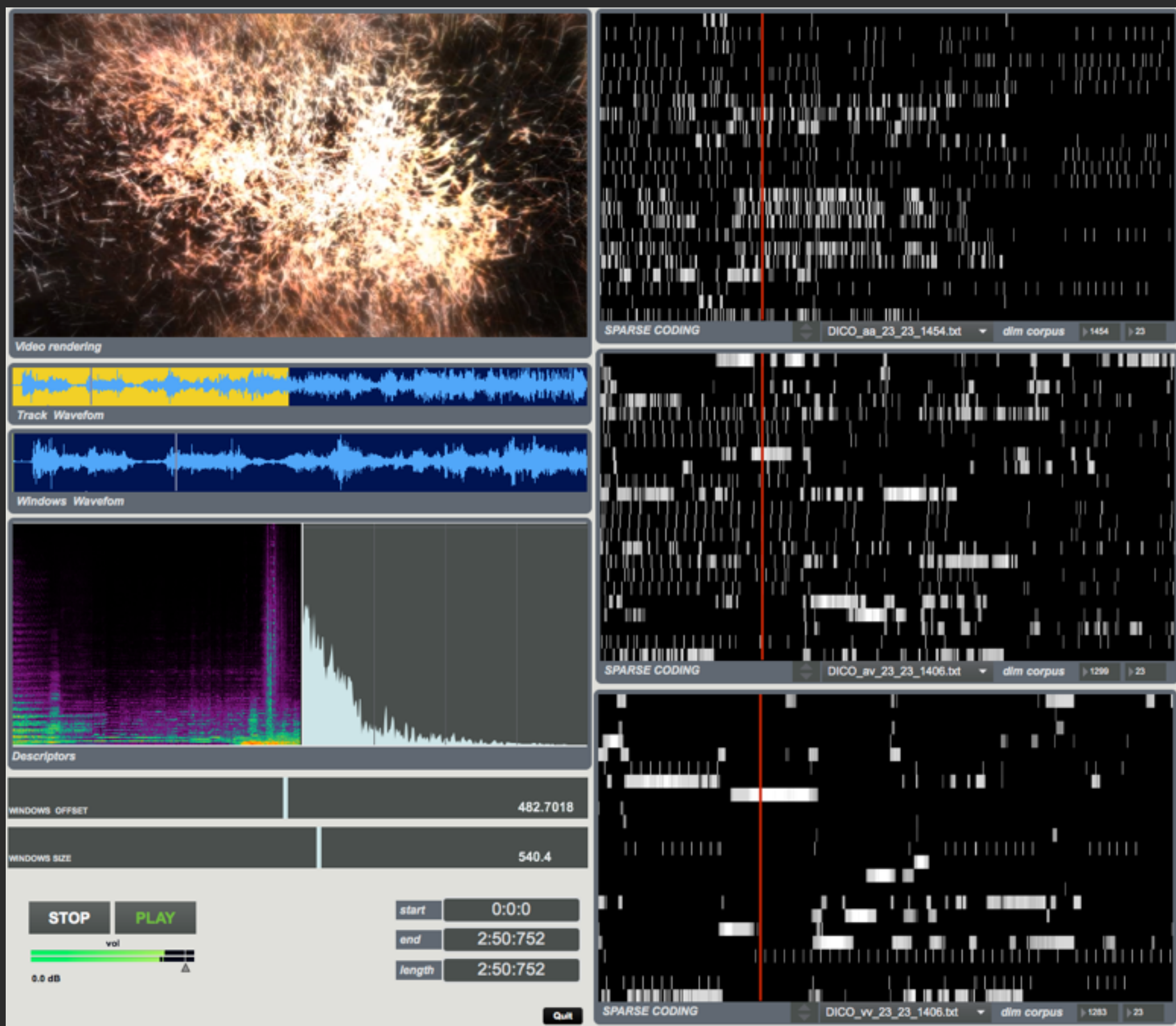
environnement de synthèse



environnement de performance

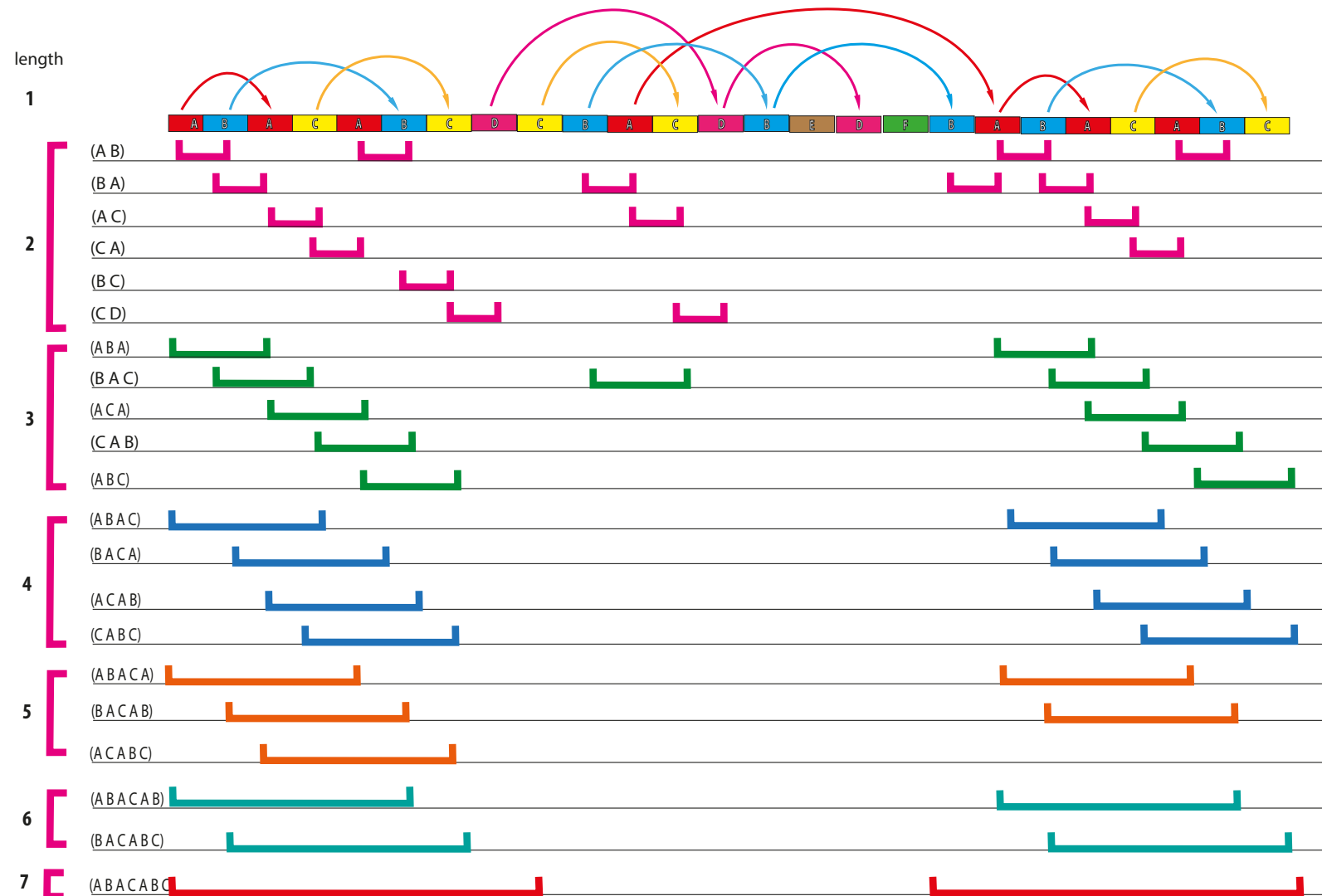
1ère étude





App de visualisation des dictionnaires

Objectif

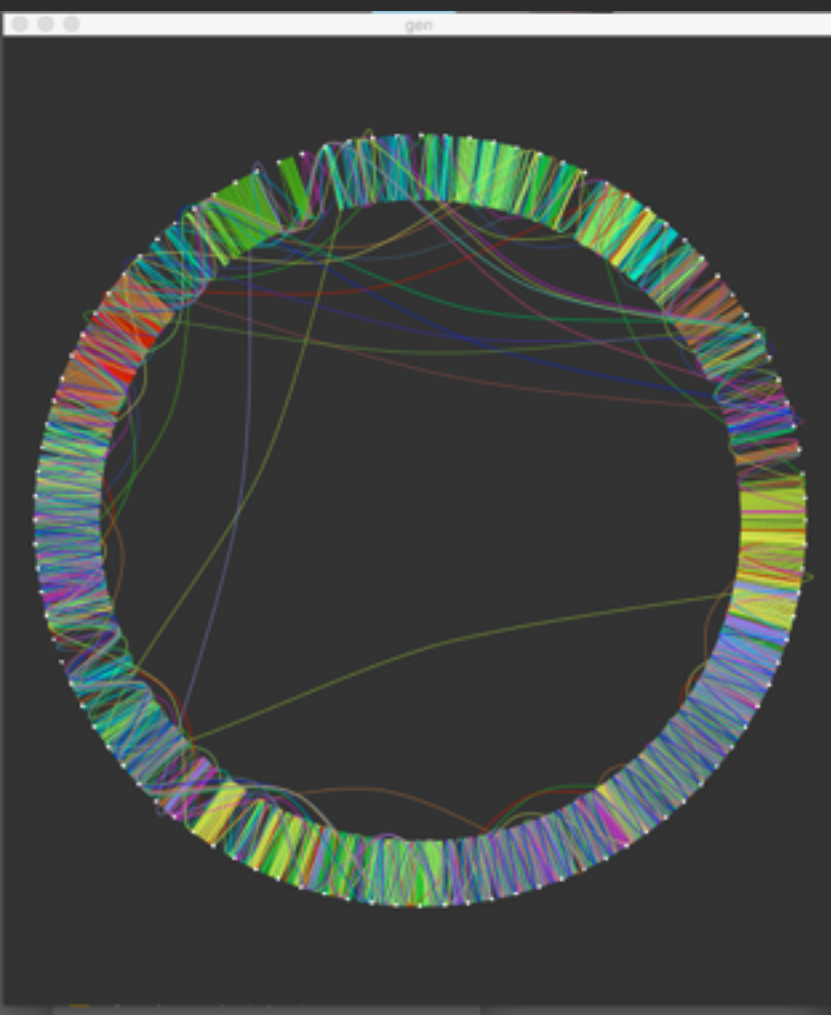


ptrn-recogn (A B A C A B C D C B A C D B E D F B A B A C A B C)

OM => ((a b "times" 4) (b a "times" 4) (a c "times" 3) (c a "times" 2) (b c "times" 2) (c d "times" 2) (a b a "times" 2) (b a c "times" 3)

(a c a "times" 2) (c a b "times" 2) (a b c "times" 2) (a b a c "times" 2) (b a c a "times" 2) (a c a b "times" 2) (c a b c "times" 2)

(a b a c a "times" 2) (b a c a b "times" 2) (a c a b c "times" 2) (a b a c a b "times" 2) (b a c a b c "times" 2) (a b a c a b c "times" 2))



[bigview] (presentation)

100% ▾

> 0.492 threshold

Score list	edit	A	N	Counter	SEQ list
1	view	0	0.00	1	0 31.00 32.00 33.00 51.00 52.00 53.00 54.00 55.00 56.00 57.00 58.00 59.00
2	view	1	89.00	2	2 93.00 104.00 126.00 137.00 148.00 159.00 170.00 181.00 192.00 203.00 214.00 236.00
3	view	2	91.00	4	3 87.00 98.00 109.00 120.00 131.00 142.00 153.00 164.00 175.00 186.00 197.00 208.00
4	view	3	91.00	3	4 95.00 106.00 128.00 139.00 150.00 161.00 172.00 183.00 194.00 205.00 216.00 238.00
5	view	4	92.00	5	5 96.00 107.00 118.00 129.00 140.00 151.00 162.00 173.00 184.00 195.00 206.00 217.00
6	view	5	93.00	6	6 43.00 89.00 100.00 111.00 122.00 133.00 144.00 155.00 166.00 177.00 188.00 199.00
7	view	6	94.00	7	7 90.00 101.00 112.00 123.00 134.00 145.00 156.00 167.00 178.00 189.00 200.00 211.00
8	view	7	97.00	8	8 42.00 71.00 88.00 99.00 110.00 121.00 132.00 143.00 154.00 165.00 176.00 187.00
9	view	8	100.00	9	9 86.00 97.00 108.00 119.00 130.00 141.00 152.00 163.00 174.00 185.00 196.00 207.00
10	view	9	101.00	10	10 73.00 94.00 105.00 127.00 138.00 149.00 160.00 171.00 182.00 193.00 204.00 215.00
11	view	10	139.00	11	11 985.00 917.00 918.00 919.00 920.00 924.00 927.00 928.00 929.00 930.00 931.00 932.00
12	view	11	173.00	12	12 43.00 44.00 45.00 46.00 47.00 48.00 49.00 50.00 51.00 52.00 53.00 54.00
13	view	12	187.00	14	13 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00 18.00 19.00 20.00
14	view	13	195.00	13	14 7.00 8.00 36.00 37.00 45.00 75.00 76.00 180.00 357.00 358.00 403.00 420.00
15	view	14	251.00	16	15 17.00 23.00 24.00 32.00 33.00 67.00 68.00 69.00 71.00 72.00 92.00 113.00
16	view	15	258.00	15	16 0.00 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00
17	view	16	267.00	17	17 41.00 42.00 43.00 44.00 47.00 63.00 64.00 65.00 66.00 67.00 68.00 76.00
18	view	17	314.00	18	18 26.00 70.00 73.00 74.00 75.00 103.00 116.00 117.00 118.00 125.00 151.00 152.00
19	view	18	342.00	19	19 0.00 1.00 148.00 149.00 150.00 151.00 152.00 153.00 154.00 155.00 156.00 157.00
20	view	19	398.00	21	20 233.00 248.00 304.00 307.00 308.00 310.00 311.00 312.00 313.00 336.00 337.00 338.00
21	view	20	405.00	20	21 35.00 61.00 81.00 91.00 102.00 113.00 124.00 135.00 146.00 157.00 168.00 179.00
22	view	21	451.00	22	22 52.00 59.00 60.00 103.00 136.00 147.00 169.00 180.00 191.00 213.00 235.00 246.00
23	view	22	458.00	0	
24	view				

