



murmur

|ℳ| murmur's documentation

How to launch “murmur” software?

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|ℳ| keyboard shortcut

F: Fullscreen

Esc : Quit software

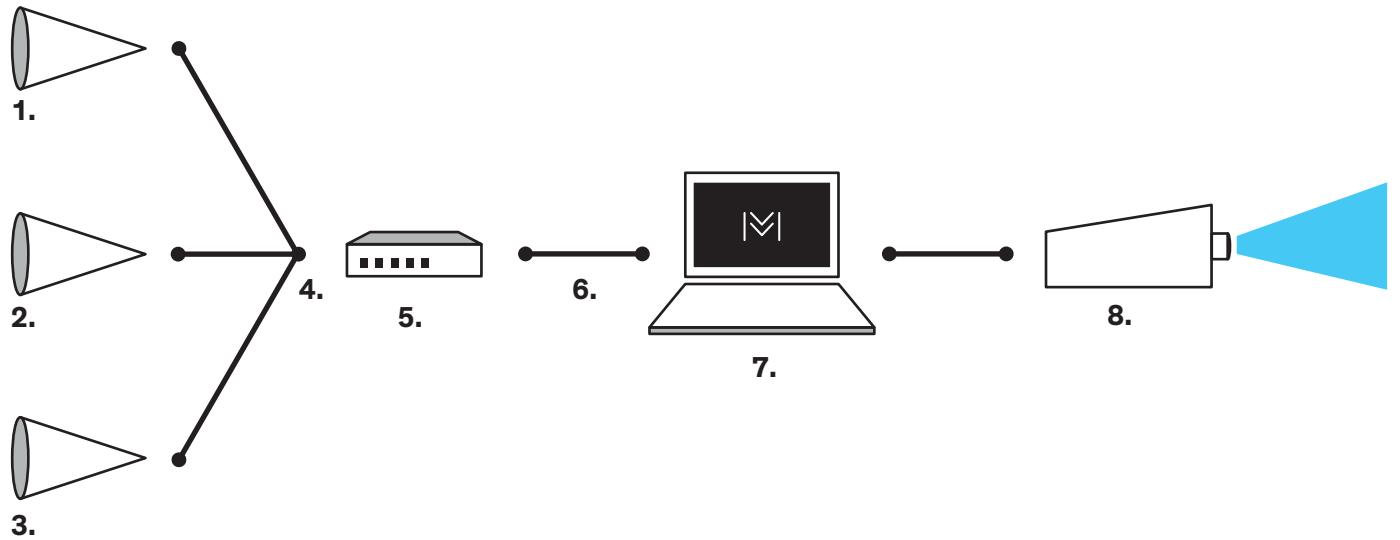
Spacebar : Fullscreen

Left and right arrows : Switch animation

|ℳ| glossary

Device :	Echo chamber.
Xml file:	EXtensible Markup Language, configuration text file.
Mapping :	Deform a video projection for adapt to the desired surface.
Madmapper :	Mapping software.
Raspberry pi:	The Raspberry Pi is an nano computer.
Quadwarping :	Technical basic mapping
Cpp :	C++ file.
FBO :	Frame Buffer Objects, drawing surface.
Drag & drop :	Move file with the mousse.

|ℳ| installation



1: Echo chamber with n° 1 with his own IP address : 10.23.108.139.

2: Echo chamber with n° 2 with his own IP address : 10.23.108.140.

3: Echo chamber with n° 3 with his own IP address : 10.23.108.141.

4: communication with the router by the port :1235.

5: Router.

6: Ethernet link between the router and the computer.

7: Computer with his own IP address exchange with the router by the port : 1234.

8: Projector.

ℳ starting configuration

For lauch MURMUR we need to open an XML file. On this file we mark informations and essential settings for setup and starting the software. This file specifies if MURMUR is in simulation mode or real mode (presentation).

```

<?xml version="1.0" encoding="UTF-8"?>
<murmur>
    <simulator>
        <!-- Activate or not simulation -->
        <enable>1</enable>
        <!-- Sound input for simulators -->
        <soundInput>
            <device><!--</device>
            <nbChannels>1</nbChannels>
        </soundInput>
        <!-- Devices -->
        <devices>
            <device>
                <id>deviceEchoSimulator01</id>
                <nblEDs>158</nblEDs>
                <length>4.0</length>
            </device>
            <!-->
            <device>
                <id>deviceEchoSimulator02</id>
                <nblEDs>158</nblEDs>
                <length>2.0</length>
            </device>
        </devices>
    </simulator>
    <!-- MadMapper -->
    <madmapper>stereolux.mad</madmapper>
    <!-- Raspberry -->
    <launchDevices>
        <ip>10.23.108.139</ip>
    </launchDevices>
</murmur>

```

1. Launch MURMUR, configuration file : /data/configuration.xml

```

<?xml version="1.0" encoding="UTF-8"?>
<murmur>
    <simulator>
        <!-- Activate or not simulation -->
        <enable>0</enable>
        <!-- Sound input for simulators -->
        <soundInput>
            <device><!--</device>
            <nbChannels>1</nbChannels>
        </soundInput>
        <!-- Devices -->
        <devices>
            <device>
                <id>deviceEchoSimulator01</id>
                <nblEDs>158</nblEDs>
                <length>4.0</length>
            </device>
            <!-->
            <device>
                <id>deviceEchoSimulator02</id>
                <nblEDs>158</nblEDs>
                <length>2.0</length>
            </device>
        </devices>
    </simulator>
    <!-- MadMapper -->
    <madmapper>stereolux.mad</madmapper>
    <!-- Raspberry -->
    <launchDevices>
        <ip>10.23.108.139</ip>
    </launchDevices>
</murmur>

```

2. Command line for specify if MURMUR is in simulation mode or in real mode :

<enable>1</enable>: simulation
 <enable>0</enable>: presentation

```

<?xml version="1.0" encoding="UTF-8"?>
<murmur>
    <simulator>
        <!-- Activate or not simulation -->
        <enable>1</enable>
        <!-- Sound input for simulators -->
        <soundInput>
            <device><!--</device>
            <nbChannels>1</nbChannels>
        </soundInput>
        <!-- Devices -->
        <devices>
            <device>
                <id>deviceEchoSimulator01</id>
                <nblEDs>158</nblEDs>
                <length>4.0</length>
            </device>
            <!-->
            <device>
                <id>deviceEchoSimulator02</id>
                <nblEDs>158</nblEDs>
                <length>2.0</length>
            </device>
        </devices>
    </simulator>
    <!-- MadMapper -->
    <madmapper>stereolux.mad</madmapper>
    <!-- Raspberry -->
    <launchDevices>
        <ip>10.23.108.139</ip>
    </launchDevices>
</murmur>

```

3. Command line indicating the sound device (microphone, sound card) and specify if MURMUR's sound captation is in mono or stereo. ([page 5](#)).

<device>0</device>: device by default
 <nbChannels>1</nbChannels>: mono

<device>1</device>: other device
 <nbChannels>2</nbChannels>: stéréo

```

<?xml version="1.0" encoding="UTF-8"?>
<configuration>
    <murmur>
        <simulator>
            <!-- Activate or not simulation -->
            <enable>1</enable>
        <!-- Sound input for simulators -->
        <soundInput>
            <device><!-->
                <nbChannels>1</nbChannels>
            </device>
        </soundInput>
        <!-- Devices -->
        <devices>
            <device>
                <id>deviceEchoSimulator01</id>
                <nblEDs>158</nblEDs>
                <length>4.0</length>
            </device>
        <!-->
        <device>
            <id>deviceEchoSimulator02</id>
            <nblEDs>158</nblEDs>
            <length>2.0</length>
        </device>
        </devices>
    </simulator>
    <!-- MadMapper -->
    <madmapper>stereolux.mad</madmapper>
    <!-- Raspberry -->
    <launchDevices>
        <ip>10.23.108.139</ip>
    </launchDevices>
</murmur>

```

4. Command line indicating how many devices (echo chamber), ledstrip's length and how many LED are on this one ([page 5](#)).

<id>deviceEchoSimulator01</id> : device's name
<nbLEDs>158</nbLEDs> : 158 LEDs
<length>4.0</length> : ledstrip's length in meter

For configure a second device :

```

<device>
    <id>deviceEchoSimulator02</id>
    <nbLEDs>158</nbLEDs>
    <length>4.0</length>
</device>

```

```

<?xml version="1.0" encoding="UTF-8"?>
<configuration>
    <murmur>
        <simulator>
            <!-- Activate or not simulation -->
            <enable>1</enable>
        <!-- Sound input for simulators -->
        <soundInput>
            <device><!-->
                <nbChannels>1</nbChannels>
            </device>
        </soundInput>
        <!-- Devices -->
        <devices>
            <device>
                <id>deviceEchoSimulator01</id>
                <nblEDs>158</nblEDs>
                <length>4.0</length>
            </device>
        <!-->
        <device>
            <id>deviceEchoSimulator02</id>
            <nblEDs>158</nblEDs>
            <length>2.0</length>
        </device>
        </devices>
    </simulator>
    <!-- MadMapper -->
    <madmapper>stereolux.mad</madmapper>
    <!-- Raspberry -->
    <launchDevices>
        <ip>10.23.108.139</ip>
    </launchDevices>
</murmur>

```

5. Command line in with which, you can charging a Madmapper composition saved in the folder : /data/Config/madmapper

```

<?xml version="1.0" encoding="UTF-8"?>
<configuration>
    <murmur>
        <simulator>
            <!-- Activate or not simulation -->
            <enable>1</enable>
        <!-- Sound input for simulators -->
        <soundInput>
            <device><!-->
                <nbChannels>1</nbChannels>
            </device>
        </soundInput>
        <!-- Devices -->
        <devices>
            <device>
                <id>deviceEchoSimulator01</id>
                <nblEDs>158</nblEDs>
                <length>4.0</length>
            </device>
        <!-->
        <device>
            <id>deviceEchoSimulator02</id>
            <nblEDs>158</nblEDs>
            <length>2.0</length>
        </device>
        </devices>
    </simulator>
    <!-- MadMapper -->
    <madmapper>stereolux.mad</madmapper>
    <!-- Raspberry -->
    <launchDevices>
        <ip>10.23.108.139</ip>
    </launchDevices>
</murmur>

```

6. Command line to launch the Raspberry pi. You can launch several Raspberry pi when there is several devices(voir [page 5](#)).

<launchDevices>
<ip>10.23.108.139</ip> : Raspberry pi IP address
</lauchDevices>

```

1 <scene>
2   <silhouettes>
3     <silhouette device="deviceEchoSimulator01">
4       <position x="0.0" y="0.0" z="4.0"/>
5     </silhouette>
6   </silhouettes>
7 
8 </scene>
9
10

```

Line 1, Column 1 Tab Size: 4 XML

7. If several devices are activated (step 4.) , we need to configure the file `scene.xml`, for add a silhouette in the software and simulate several users.
[/data/Config/scene.xml](#)

```

1 <scene>
2   <silhouettes>
3     <silhouette device="deviceEchoSimulator01">
4       <position x="2.0" y="0.0" z="4.0"/>
5     </silhouette>
6   </silhouettes>
7 
8 <silhouettes>
9   <silhouette device="deviceEchoSimulator02">
10    <position x="-2.0" y="0.0" z="4.0"/>
11  </silhouette>
12 </silhouettes>
13
14 </scene>
15

```

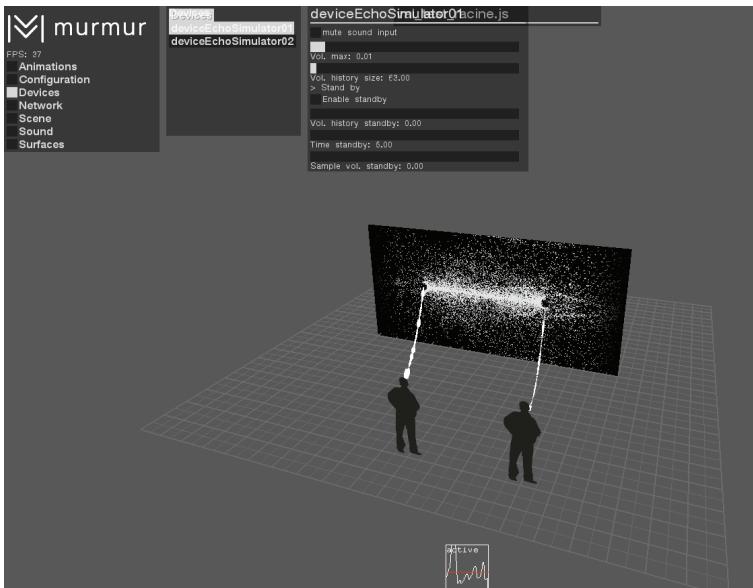
Line 5, Column 27 Tab Size: 4 XML

8. For add a new silhouette to scene, we need to write this command line:

```

<silhouettes>
<silhouette
device=>deviceEchoSimulator02>:second
silhouette name
<position x=>-2.0 y=>0.0 z=>4.0/>:silhouette
position
</silhouette>
</silhouettes>

```



9. By default, when there is just one device, the silhouette is in the center of the scene.

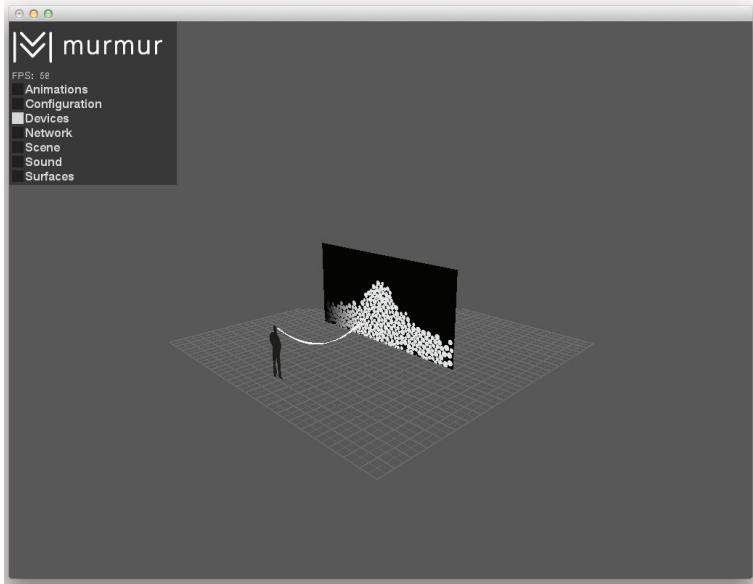
```

<silhouette
device=>deviceEchoSimulator01>:first
silhouette name
<position x=>-0.0 y=>0.0 z=>0.0/>:the
silhouette's position in the center of the scene

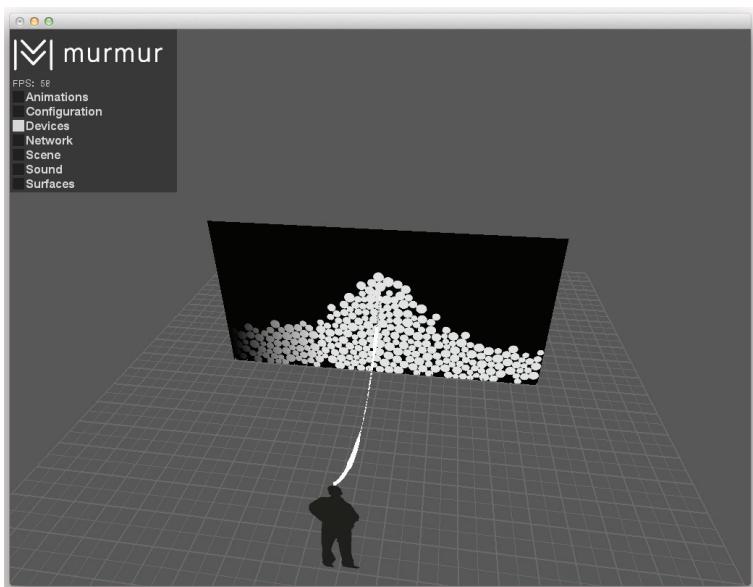
```

|ℳ| first look

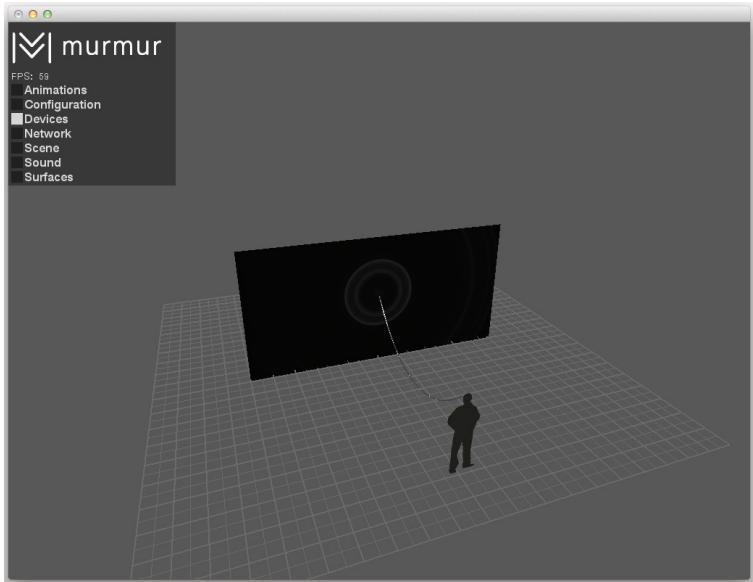
MURMUR software is a 3D environment. With this software we can calibrate physical space, but also differentes interactions accessible via several tabs



- 10.** General visuel of the MURMUR's software interface. There are 3 elements :
- user
 - the ledstrip
 - the projection surface



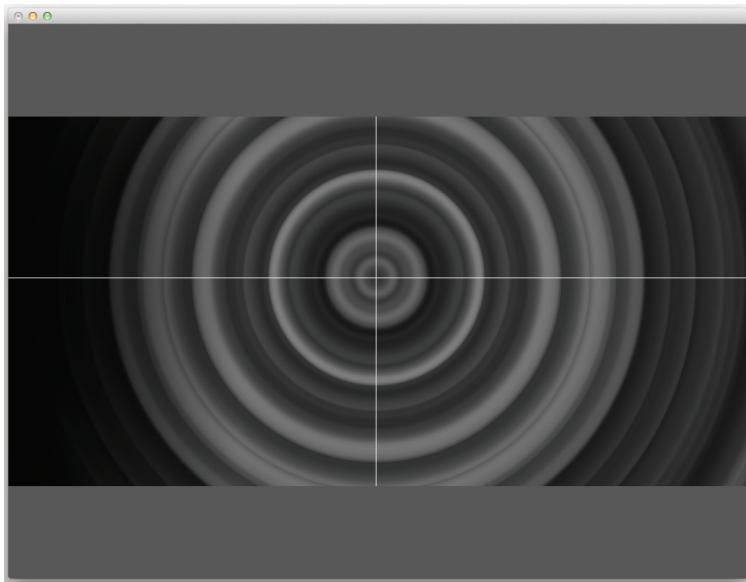
- 11.** The interface is a 3D scene with several tabs on the left. Those tabs contain differents tools for MURMUR calibration.



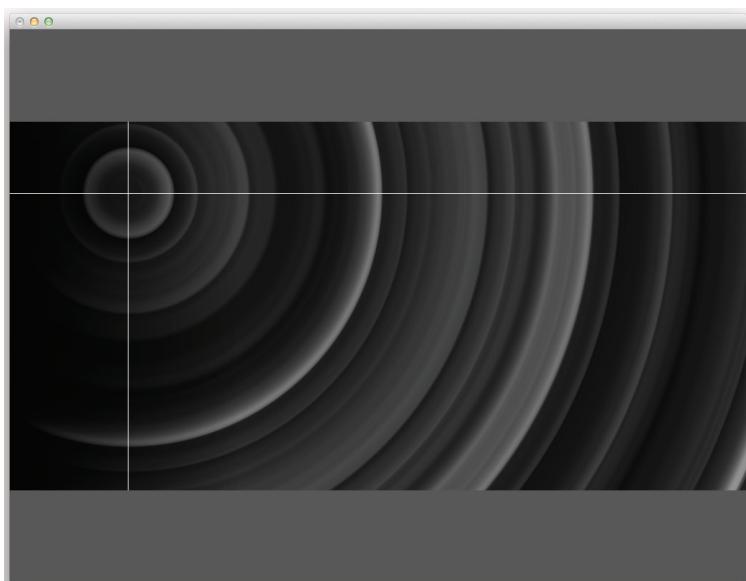
- 12.** We can move inside the scene with the mouse.

|▽| fullscreen

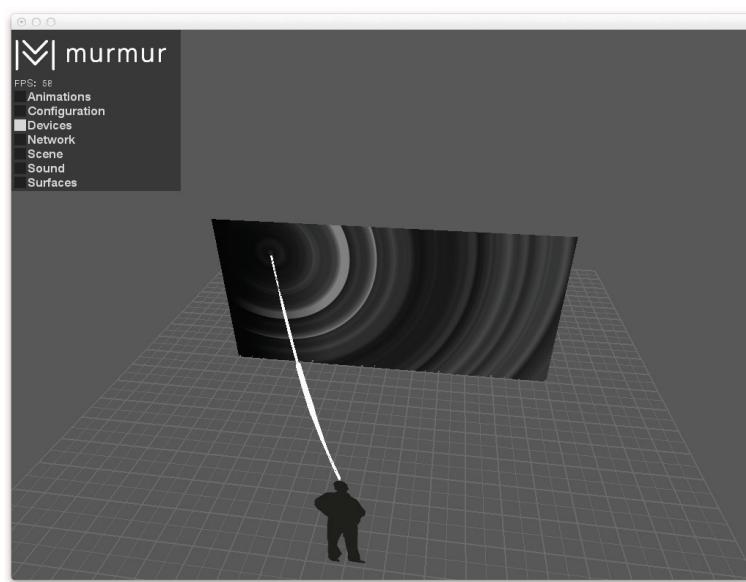
The full screen allow to visualising differentes animations without the 3D scene for more precision.



13. We can switch to the full screen with the shortcut “space bar”



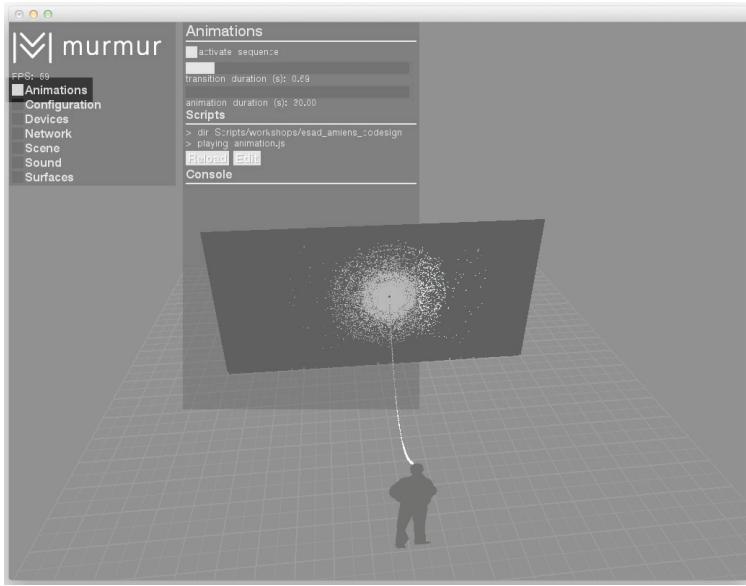
14. With the fullscreen, you can change the ledstrip attachment point position. His position is indicated by the white cross. For change the position , you just have to click where you want. Don't forget, for see the device position point, you need to deactivate the “quadwarping” option in the “Surfaces” tab



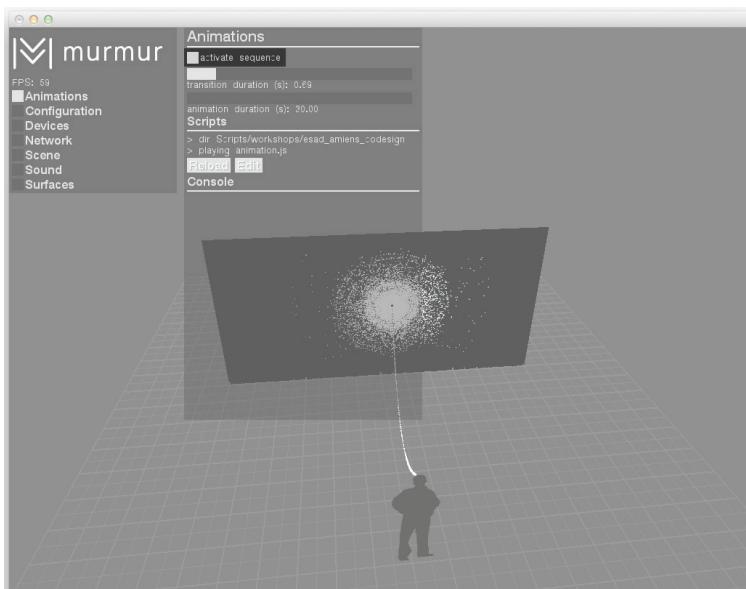
15. For come back to 3D scene, use again the shortcut “space bar”.

|▽| animation

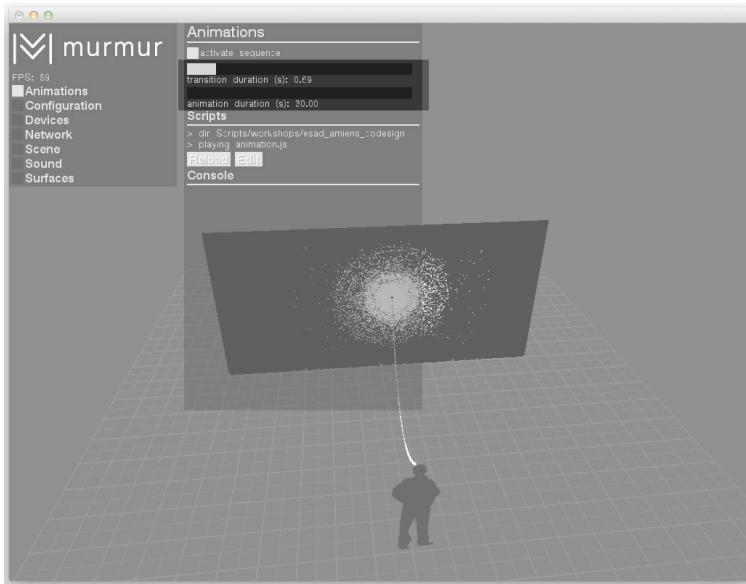
The animation tab allows to calibrate several animations. there is two sorte of animations : Cpp animations, they are an integral part of the software and not editable via a text editor. JS animations are editable dynamically, observable and alterable in real time.



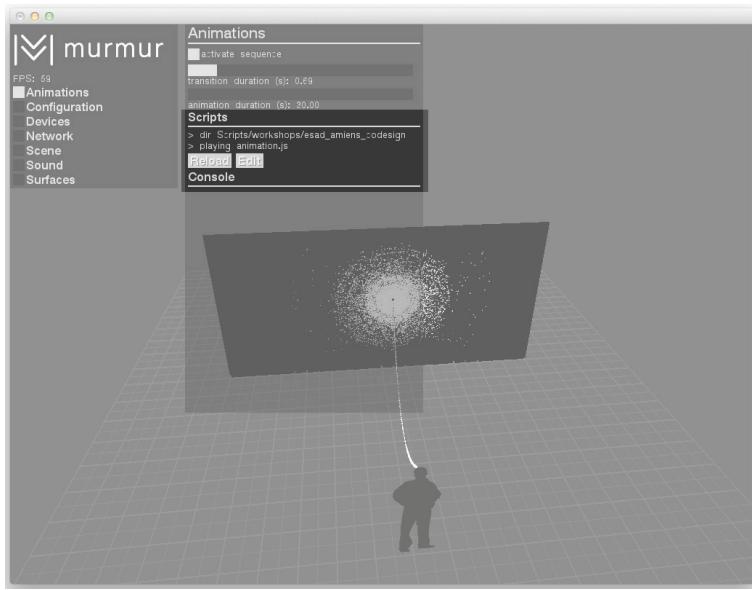
16. The tab “Animation”, allows control different visuals and animations. All change are automatically save when you close the software



17. “Activate sequence” allows to launch a playlist of several animations. Some animations can be directly alterable in the software. In this case, a new tab with different settings appears.



18. “Transition duration” allows to create a melted between the animations, while “animation duration” allows to calibrate the animation play time. The animation minimum time is 30 seconds.



19. The “Scripts” part, allows to visualize the animation name and his localisation in your computer. By default, the Js scripts are in the folder:
[/data/Scripts/](#)

The “Edit” toggle allows to open the script in read with text editor for some modifications. Use the “reload” toggle for see the new animation. (step **22**).

surfacemain.xml

```

1 <surface id="main">
2   <animations type="cpp">
3     <animation>shaderWave</animation>
4     <animation>particleMega2</animation>
5     <animation>box2DCircles</animation>
6   </animations>
7
8   <animations type="js" folder="workshops/esad_animens_codesign">
9     <!--
10    <animations type="js" folder="murmur">
11    <animations type="js" folder="workshops/stereolux_jcc2">
12    -->
13  </animations>
14
15  <timeline>
16    <animation>tunnel</animation>
17    <animation>particleMega2</animation>
18    <animation>box2DCircles</animation>
19    <animation>shaderWave</animation>
20    <animation>waves2.js</animation>
21  </timeline>
22
23 </surface>
24
25

```

Line 1, Column 1 Spaces: 4 XML

20. the file [surfacemain.xml](#) allows to configure the animation playlist :
[/data/Config/surfaces/surfacemain.xml](#)

surfacemain.xml

```

1 <surface id="main">
2   <animations type="cpp">
3     <animation>shaderWave</animation>
4     <animation>particleMega2</animation>
5     <animation>box2DCircles</animation>
6   </animations>
7
8   <animations type="js" folder="workshops/esad_animens_codesign">
9     <!--
10    <animations type="js" folder="murmur">
11    <animations type="js" folder="workshops/stereolux_jcc2">
12    -->
13  </animations>
14
15  <timeline>
16    <animation>tunnel</animation>
17    <animation>particleMega2</animation>
18    <animation>box2DCircles</animation>
19    <animation>shaderWave</animation>
20    <animation>waves2.js</animation>
21  </timeline>
22
23 </surface>
24
25

```

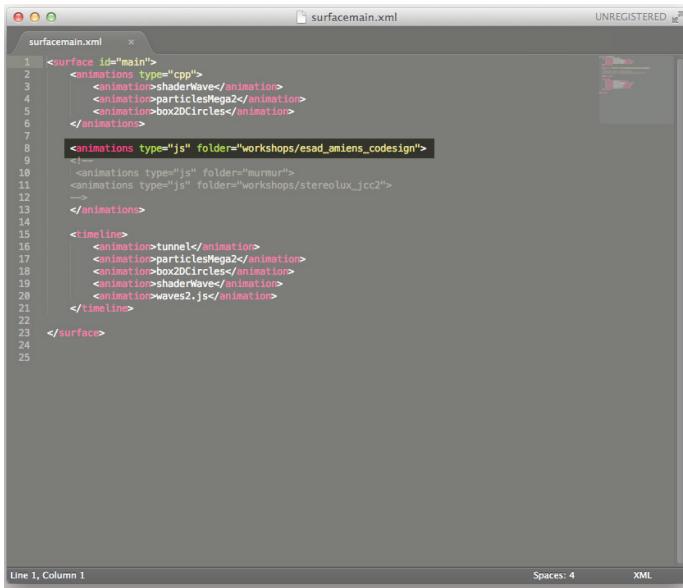
Line 1, Column 1 Spaces: 4 XML

21. For declare Cpp animation, you need to modified those next lines, in add animations names :

```

<animations Type="cpp">
<animation>chaderWave</animation>:anim. 1
<animation>particleMega2</animation>:anim. 2
<animation>box2DCircles</animation>:anim. 3
</animations>

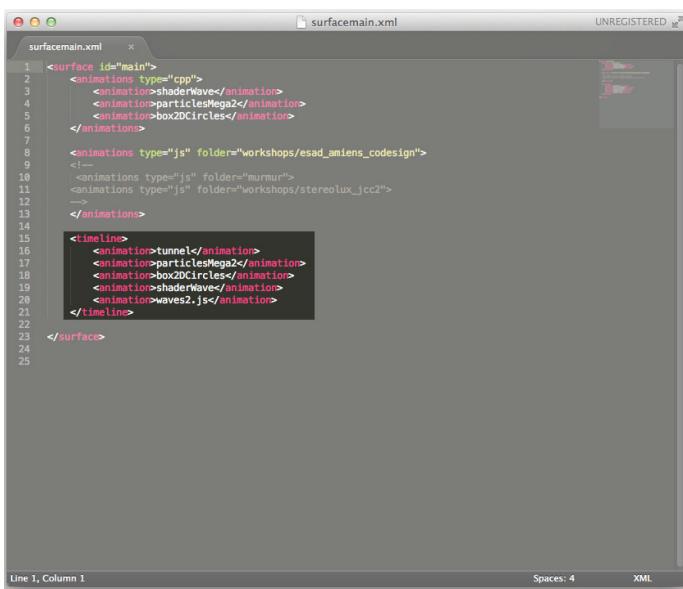
```



```
1 <surface id="main">
2   <animations type="cpp">
3     <animation>shaderWave</animation>
4     <animation>particlesMega2</animation>
5     <animation>box2DCircles</animation>
6   </animations>
7
8   <animations type="js" folder="workshops/esad_amiens_codesign">
9     <!--
10    <animations type="js" folder="murmur">
11      <animation>particlesMega2</animation>
12      <animation>box2DCircles</animation>
13      <animation>shaderWave</animation>
14      <animation>waves2.js</animation>
15    </animations>
16    <timeline>
17      <animation>tunnel</animation>
18      <animation>particlesMega2</animation>
19      <animation>box2DCircles</animation>
20      <animation>shaderWave</animation>
21      <animation>waves2.js</animation>
22    </timeline>
23  </surface>
24
25
```

22. This command line allows to specify a sub folder containing JS animations in the folder:
/data/Scripts/

<animations type="js" folder="murmur">



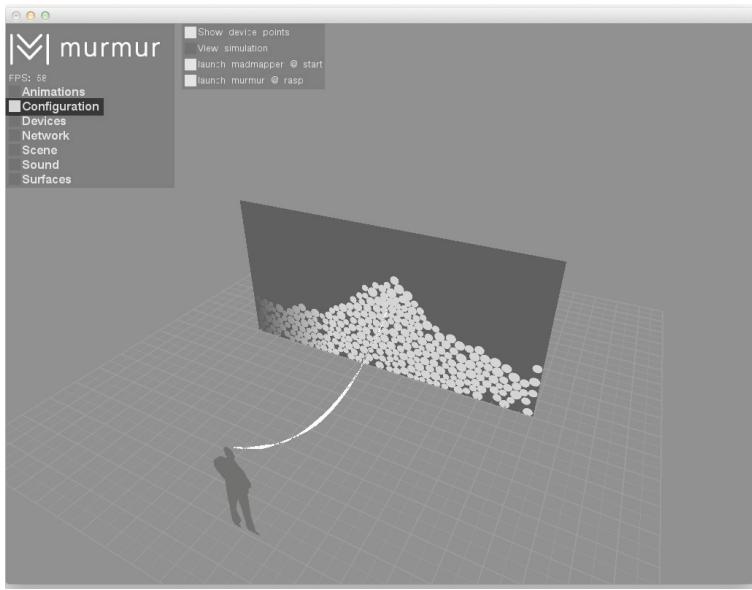
```
1 <surface id="main">
2   <animations type="cpp">
3     <animation>shaderWave</animation>
4     <animation>particlesMega2</animation>
5     <animation>box2DCircles</animation>
6   </animations>
7
8   <animations type="js" folder="workshops/esad_amiens_codesign">
9     <!--
10    <animations type="js" folder="murmur">
11      <animation>particlesMega2</animation>
12      <animation>box2DCircles</animation>
13      <animation>shaderWave</animation>
14      <animation>waves2.js</animation>
15    </animations>
16    <timeline>
17      <animation>tunnel</animation>
18      <animation>particlesMega2</animation>
19      <animation>box2DCircles</animation>
20      <animation>shaderWave</animation>
21      <animation>waves2.js</animation>
22    </timeline>
23  </surface>
24
25
```

23. This command line allows to create animation playlist (step **17**):

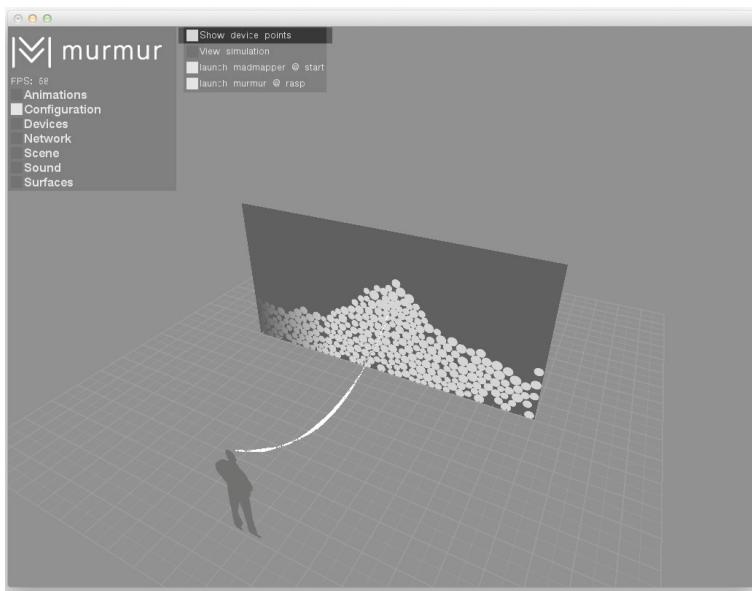
```
<timeline>
<animation>tunnel</animation>:anim. 1
<animation>particlesMega2</animation>:anim. 2
<animation>box2DCircles</animation>:anim. 3
<animation>shaderWave</animation>:anim. 4
<animation>waves2js</animation>:anim. 5
</timeline>
```

☰ configuration

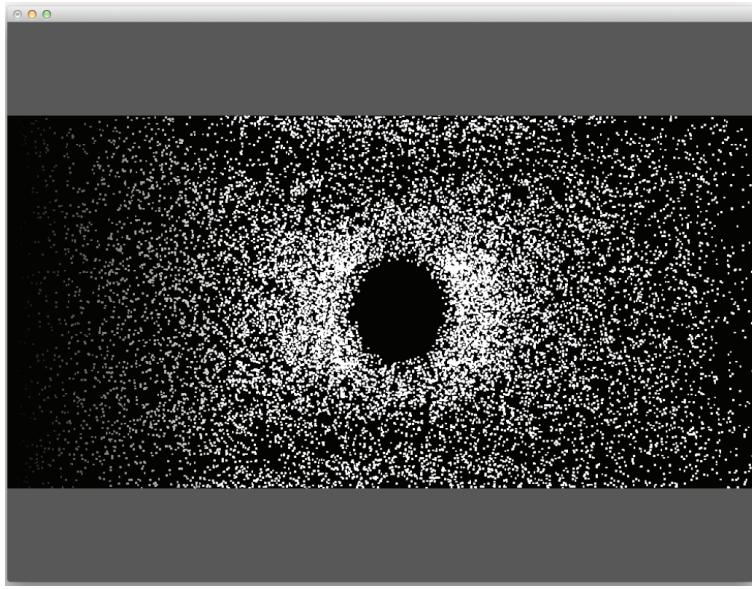
The configurations tab is especially important in real mode. This tab allows to calibrate some options and make link with other software like madMapper.



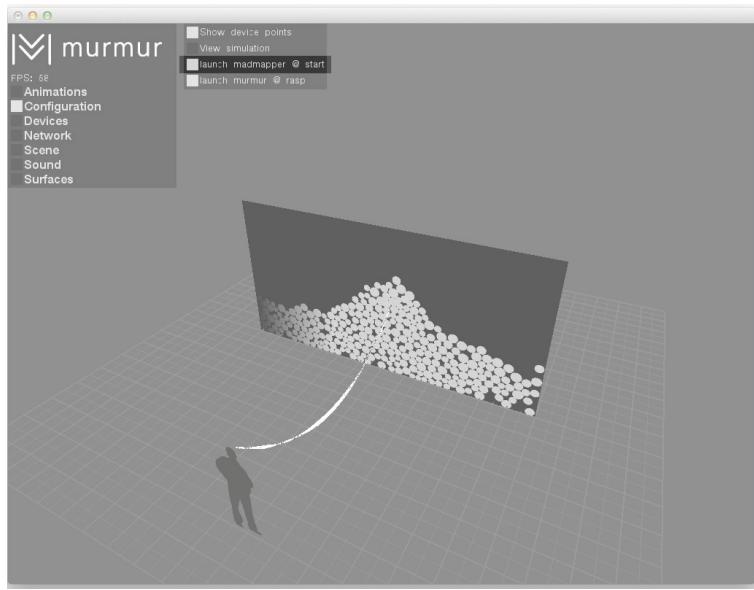
24. The configurations tab sets some parameters when software opening and also activating some options of MURMUR.



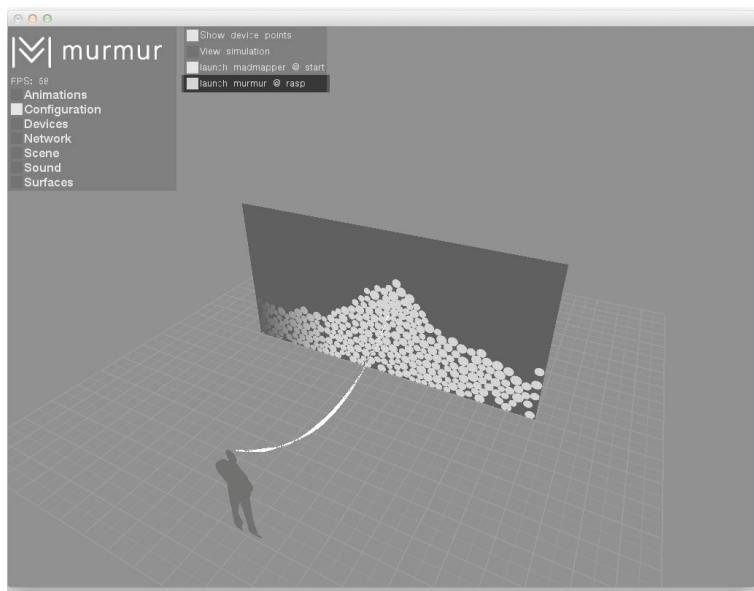
25. "Show device points" displays the device position when the fullscreen is activated. Don't forget to deactivate the "quadwarping" option in "Surfaces" (step 53)



26. The device center is invisible once the option "Show device points" is desactive.



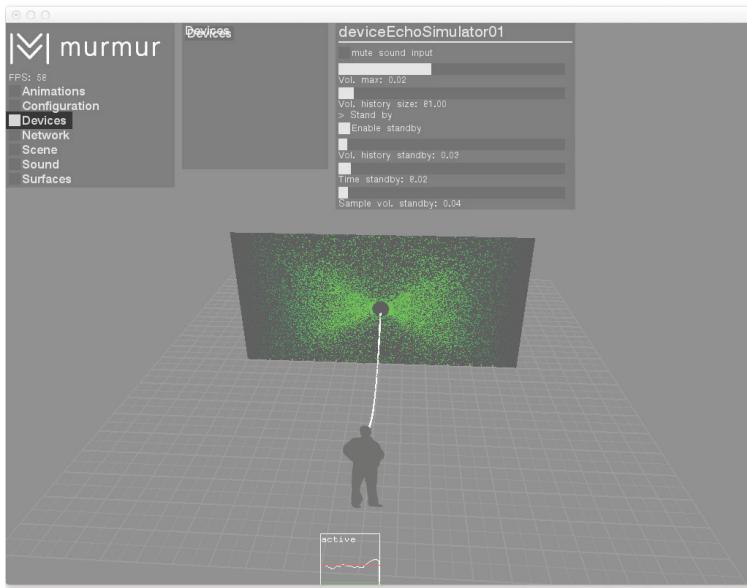
27. “launch madmapper @ start” option allows, the upcomming launch of murmur in real mode to open automatically a madMapper composition (step **5**).



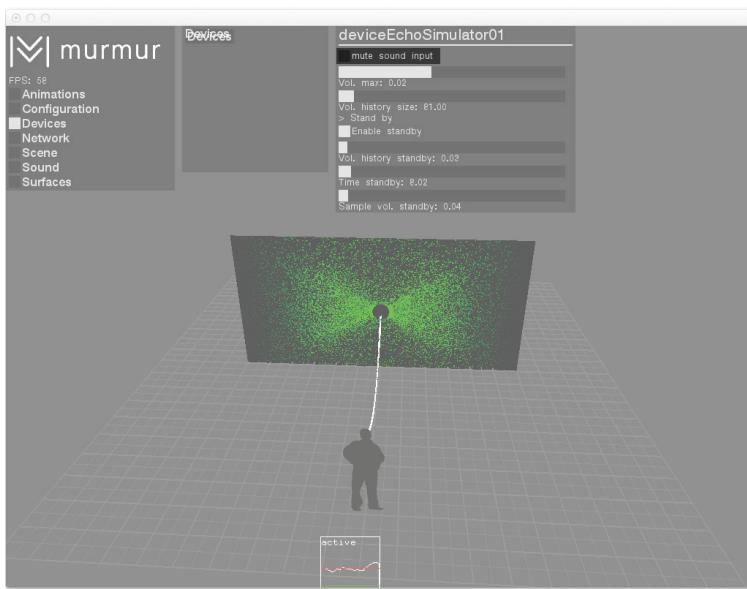
27. “launch murmur @ rasp” option allows, the upcomming launch of murmur in real mode to open automatically the Raspberry pi (step **6**).

|ℳ| devices

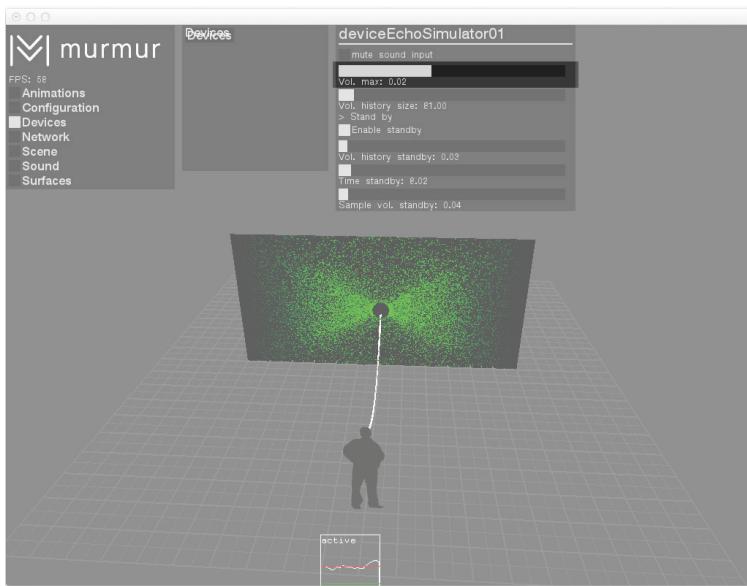
With murmur, we use the term device for speak about echo chambers. This device are composed by a Raspberry pi with his own IP address. Each devices has his own identity and its possible to add echo chambers as we need (step **4.**).



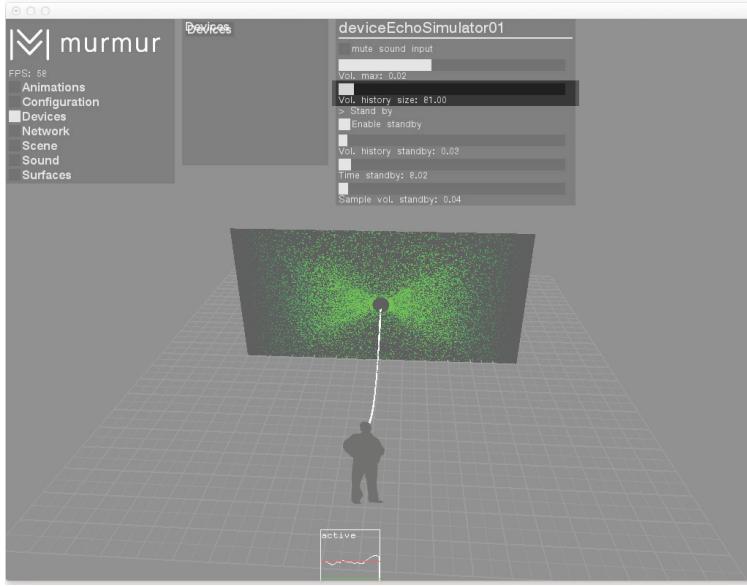
29. The “devices” tab allows to calibrate sound capture, with spectateur or not (standby mode step **33**).



30. activating “mute sound input”, you stop the sound capture. MURMUR pass in mute mode.

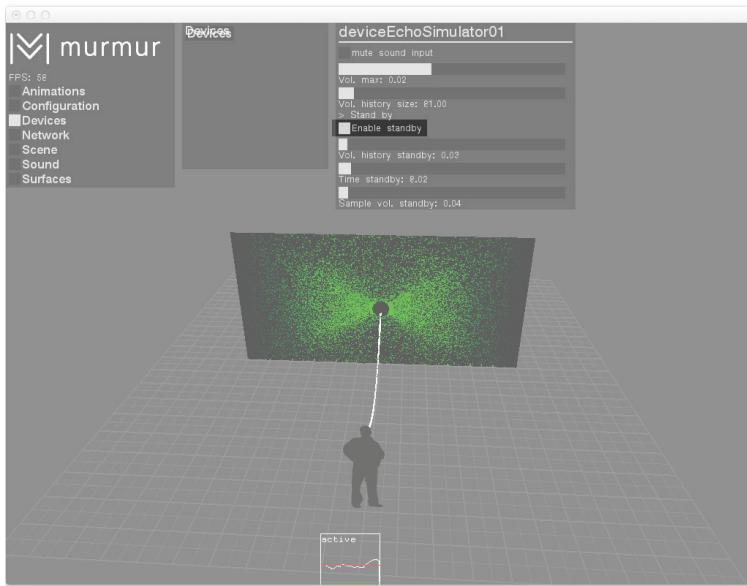


31. “Vol. max” allows to adjust the volume of sound capture.



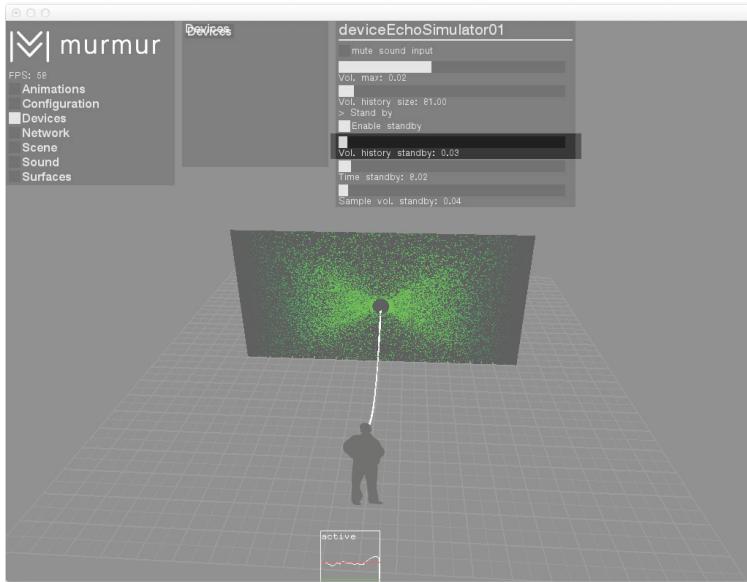
32. “Vol. history sizes” calibre the speed of moving sound signal along the ledstrip.

“Vol. history sizes: 500.00” slow signal
“Vol. history sizes: 50.00” speed signal



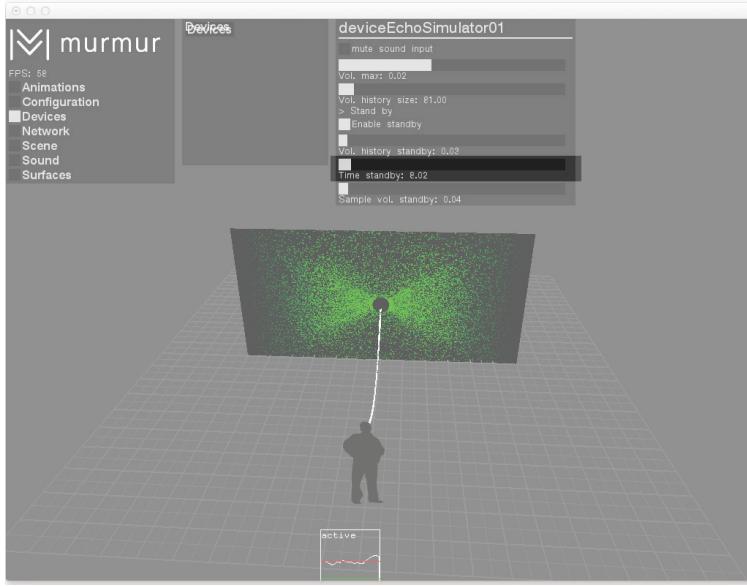
33. “Enable standby” active or desactive standby mode.

The standby mode launches when no sound are captured, in this case the software generate automatically a regular small sound signal so that the installation is visually active

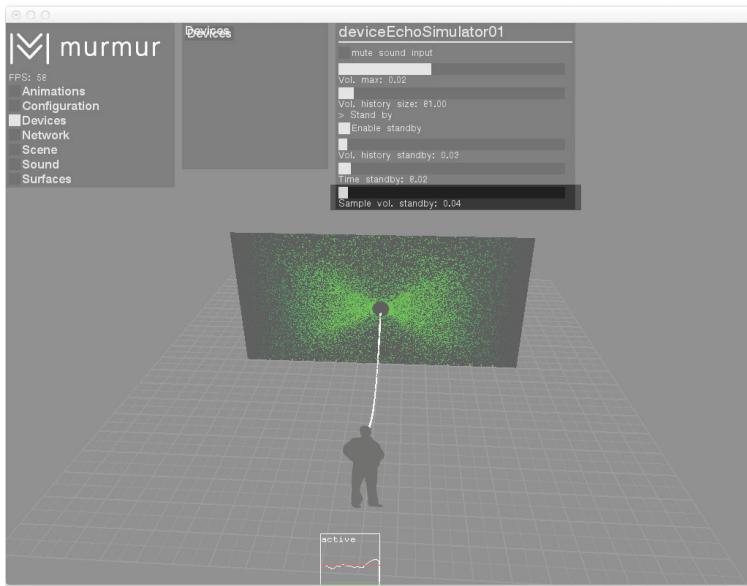


34. “Vol. history standby” allows to adjust the sound level so as to calibrate the standby mode

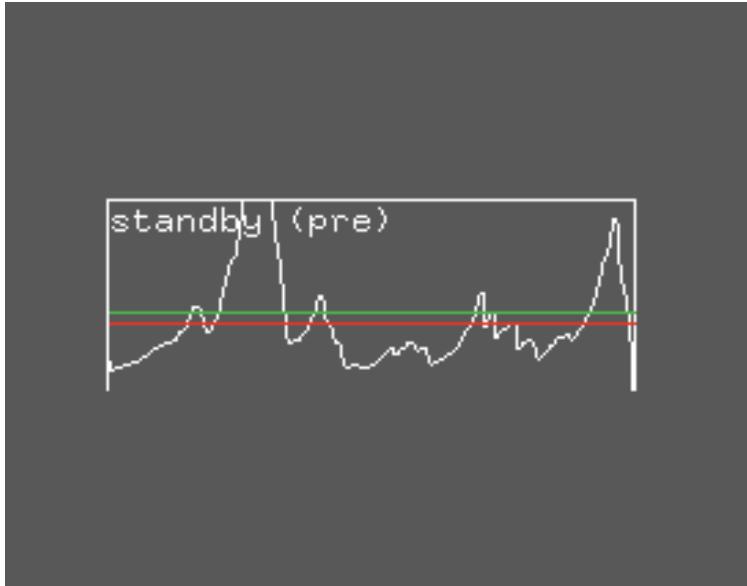
“Vol. history standby: 0.00” the standby mode when sound signal is egal 0
“Vol. history standby: 0.75” the standby mode when sound signal is below 0.75



35. “Time standby” adjusts the waiting time before launch the standby mode.



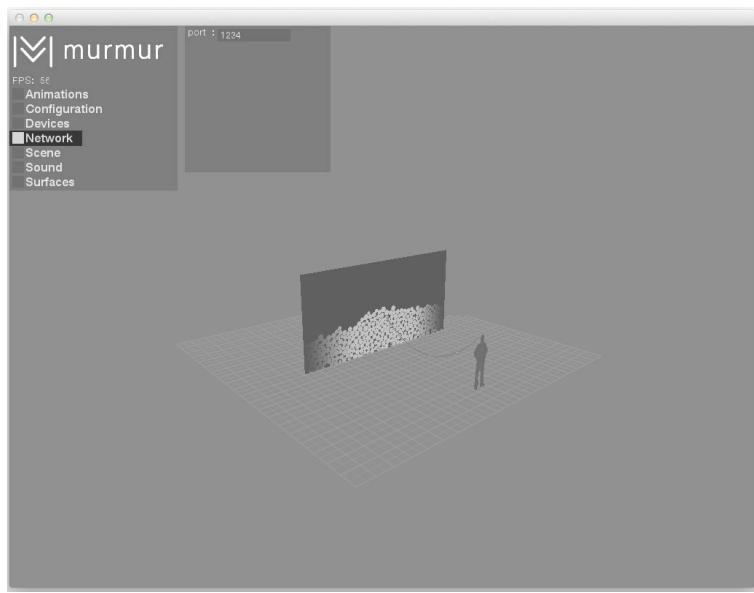
36. “Sample vol. standby ” adjusts the level sound of the standby mode.



37. This window, in the bottom of the screen allows to see different changes of steps 31, 32, 33, 34, 35 and 36.

The white curve represents the sound capture, the red line represents the average volume and the green line represents the minimum volume before the launch of standby mode

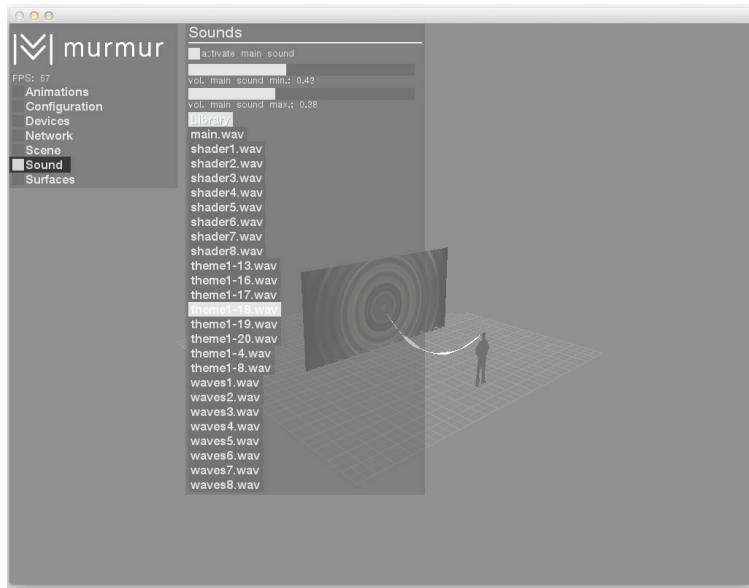
|ℳ| network



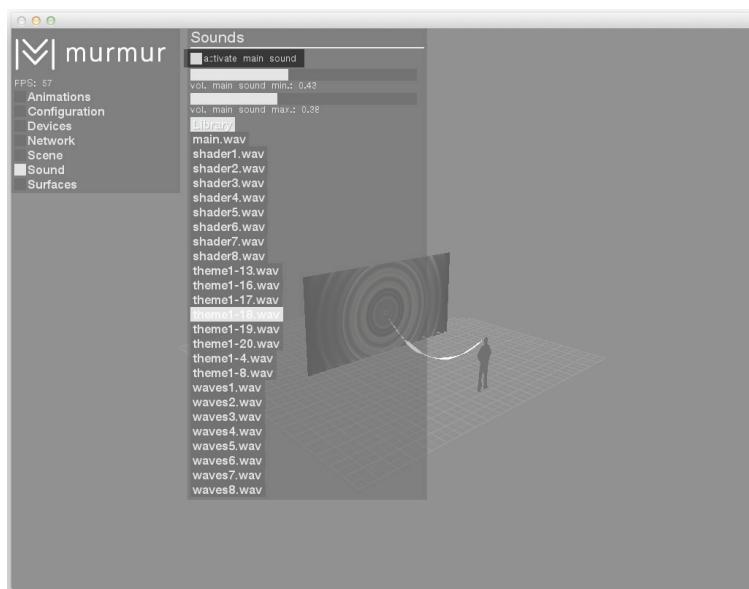
38. The “Network” tab allows to indicate the port for OSC messages. By default, murmur use the port 1234 (page 5).

|ℳ| sound

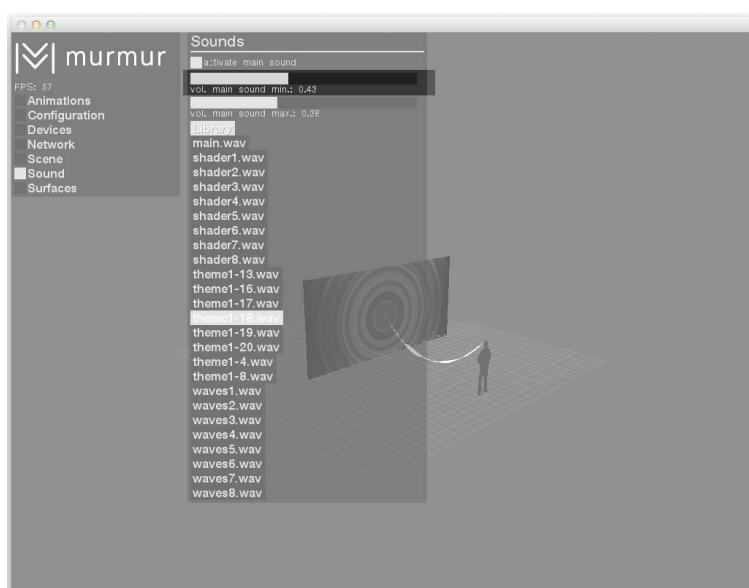
the sound tab rallies several tools allowing to calibrate the software's sound. It allows also to visualise a sound sample librairie of MURMUR .



39. the “sound” tab allows to calibrate the software’s sound.

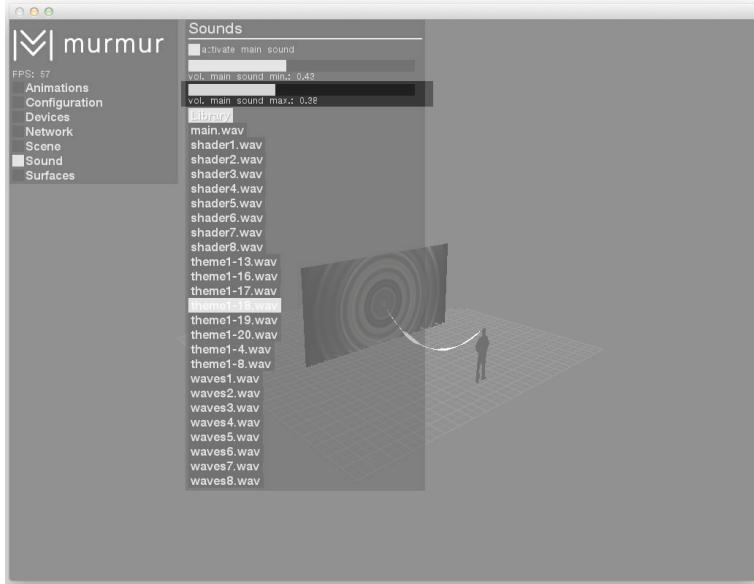


40. “activate main sound” allows to mute the software’s sound.

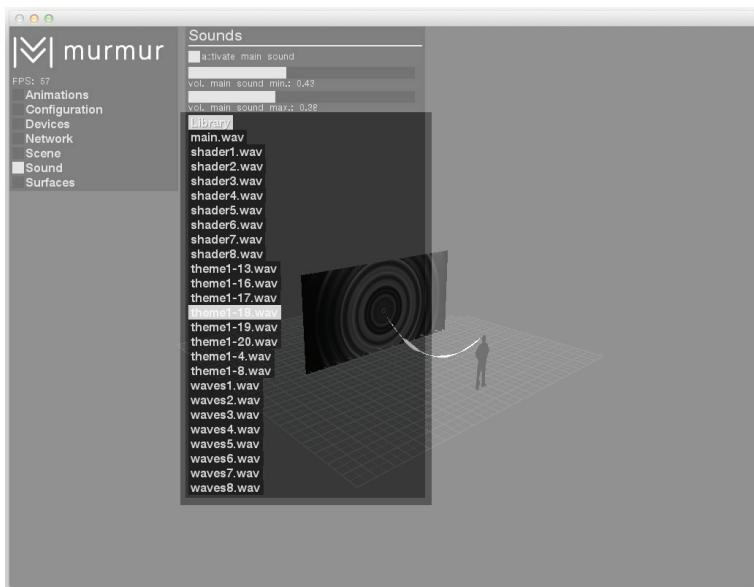


41. “Vol. main sound min” adjusts the volume of the software’s sound.

42.

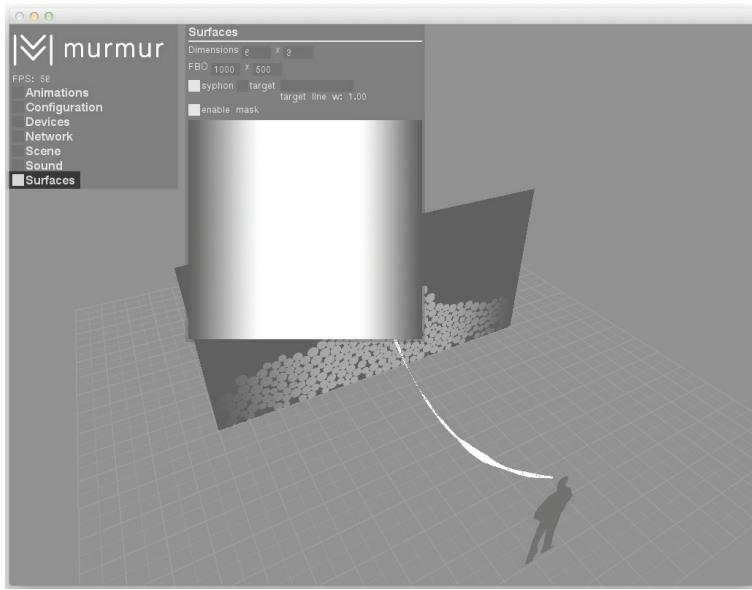


43. “Library” rallies allsound samples of MURMUR. They are in the folder: /data/Sounds/

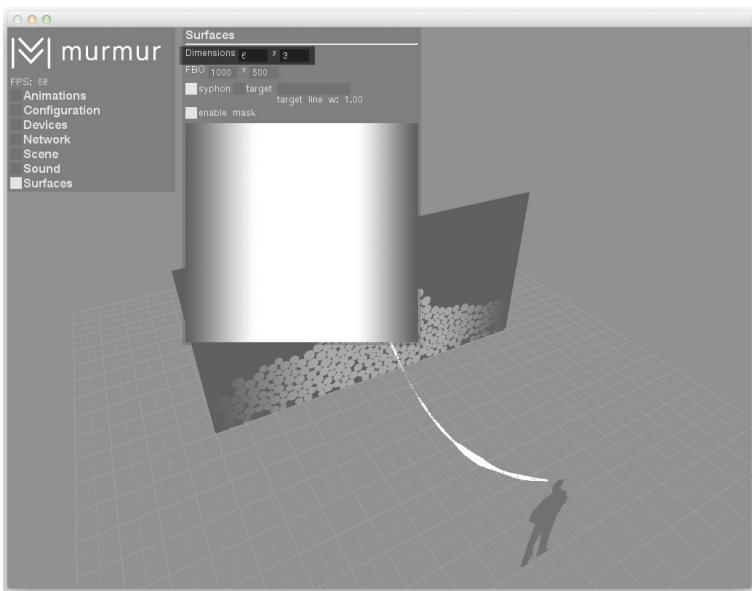


|▽| surface

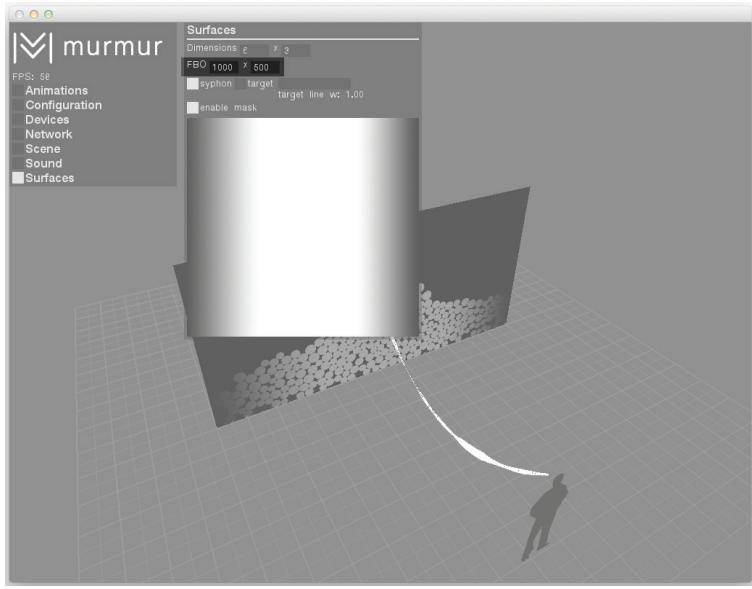
The surface tab allows to manage the projection surface options and the projection herself



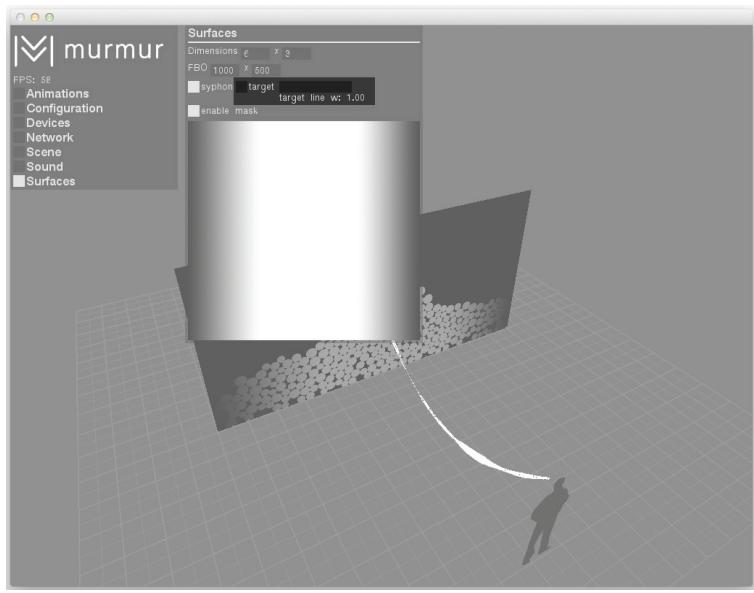
44. The “Surfaces” tab contain settings about the environment of projection, his size, his specificities.



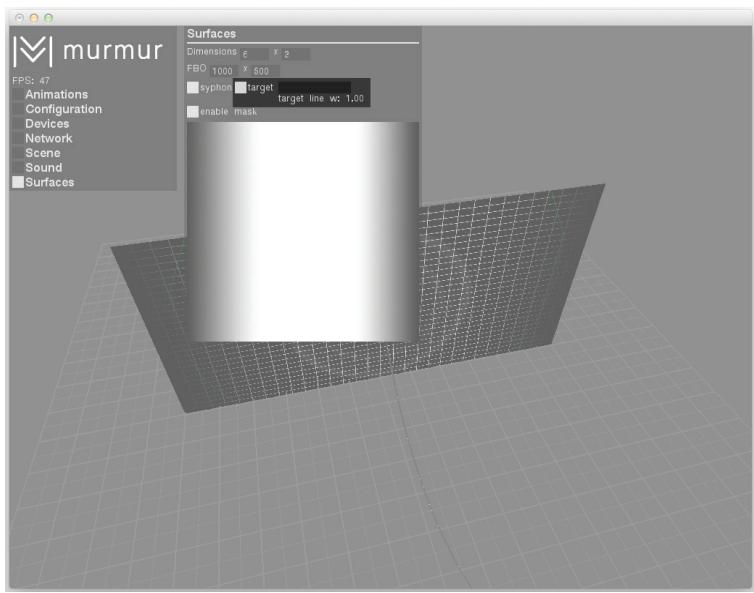
45. “Dimensions” allows to manage the projection surface size, his width, his length in meter.



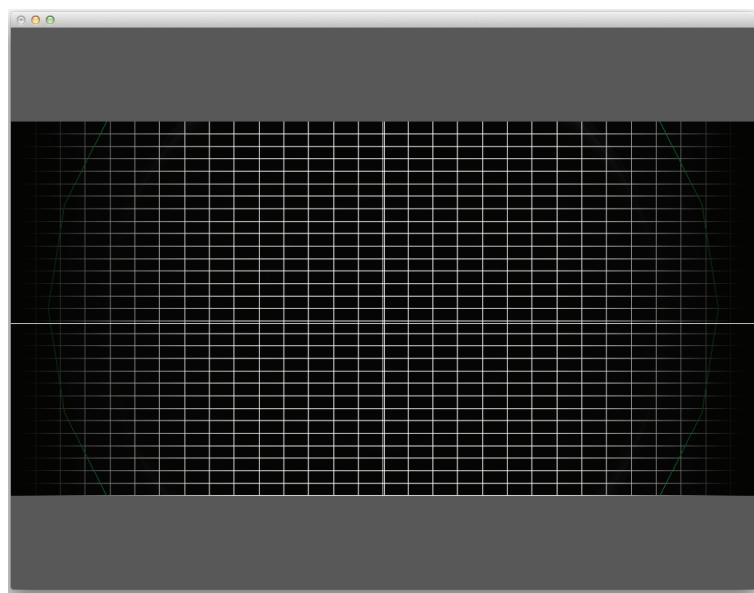
46. “FBO” caliber proportionally the drawing surface. You need to manage this parameters homothetically with the dimensions of step **45**.



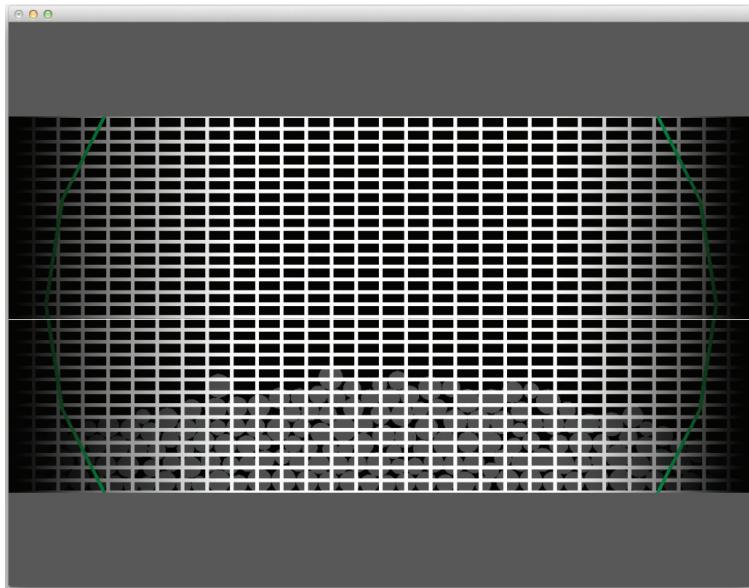
47. The “Target” parameters , generates a grid on the projection surface. With the grid, utilisation of madMapper is more easy



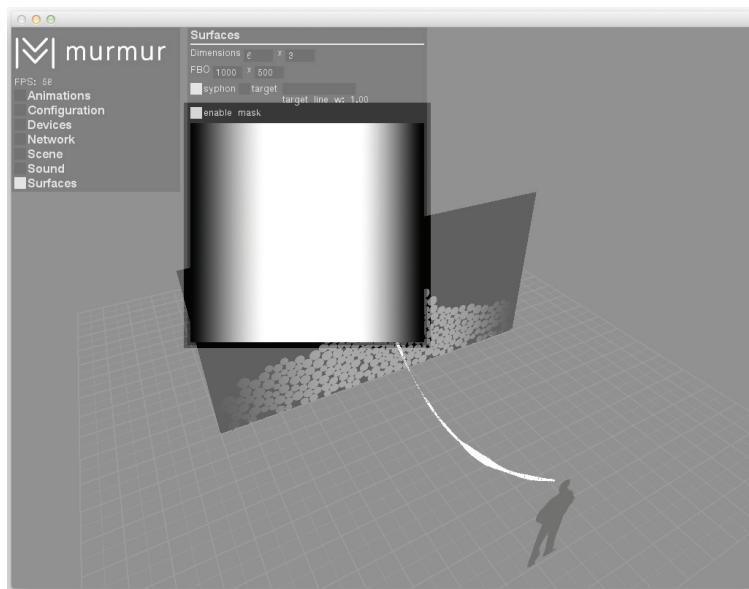
48. “Target line w” changes the thickness of the grid



49. “Target line w: 1.00 ”.

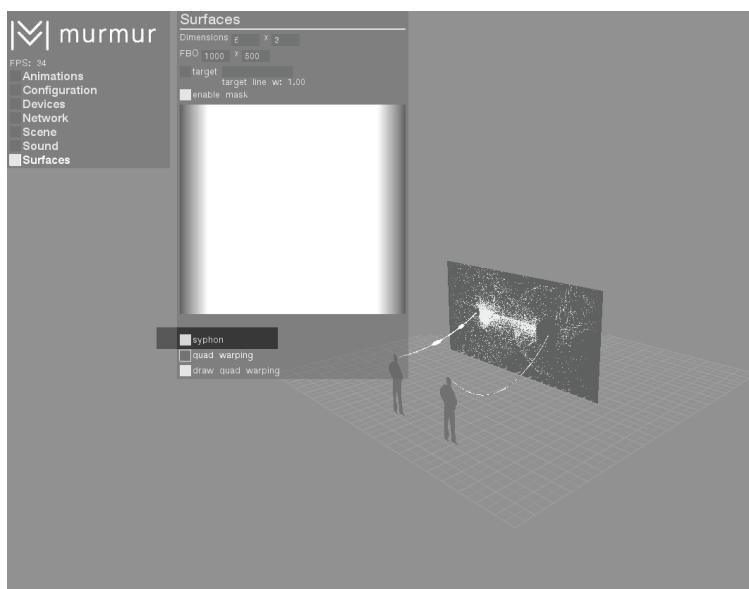


50. “Target line w:8.00”.

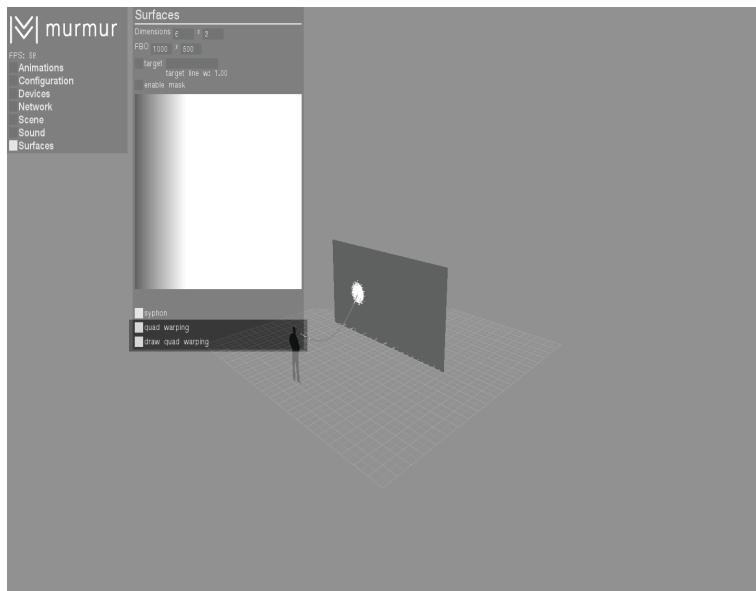


51. “enable mask”, active an mask on the screen, for create a gradient screen and simulate the physical edges.

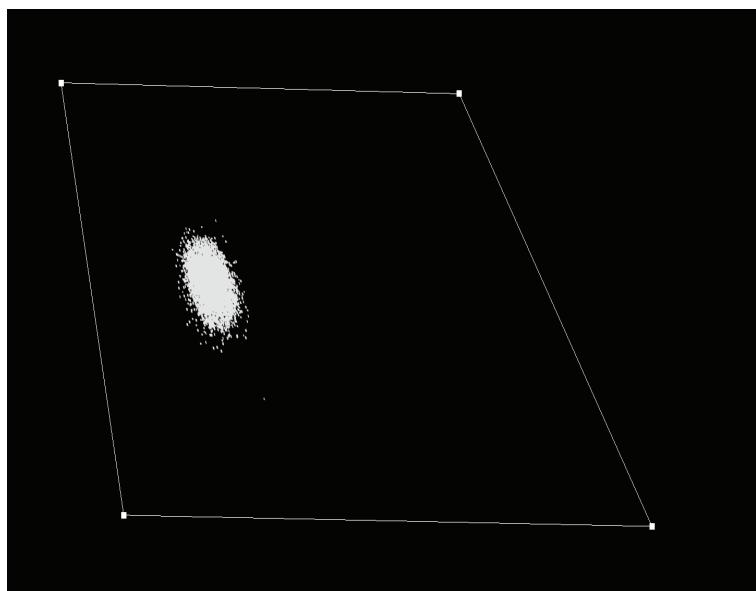
For add a mask, you have just to create a square picture and drag her in the software.



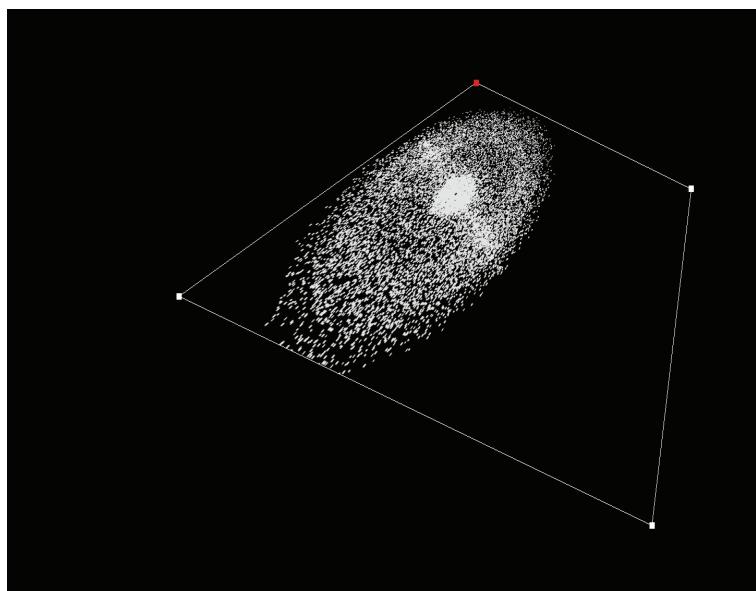
52. “syphon” allows to active the screen sharing between MURMUR and madMapper



53. The “quad warping” option and “draw quad warping” allows to deform the screen so as to change the perspective and adapt the projection to the environment. If the deformation is too important, uses “syphon” and madMapper (step **52** and **5**).



54. When “quad warping” and “draw quad warping” are activated, use the shortcut “space bar” for switch in fullscreen mode.



55. For modify the projection’s form, uses the mouse, for moving corners and obtain the good deformations.