

Soundcool: Installation and Basic Operation

Introduction

Soundcool is a collaborative system for sound and music creation using mobile phones, tablets, Kinect and MAX / MSP / Jitter. *Soundcool* has been introduced into educational centers at primary and secondary levels. The core of the *Soundcool* system is available for free. *Soundcool* is being developed at the “Universitat Politècnica de València, UPV” (Spain). The key projects relating *Soundcool* are:

- Soundcool has been adopted in the European project Erasmus+ KA201 “Technology to support learning and creativity: building European networks through collaborative music creation” (“Tecnología al servicio del aprendizaje y la creatividad: tejiendo redes europeas a través de la creación musical colaborativa”, 2015-2017), led by Dr. Elizabeth Carrascosa, and with the following reference 2015-1-ES01-KA201-016139. As a result, Soundcool has been introduced into several European educational centers.
- Generalitat Valenciana (Spain) grant AICO/2015/120: “New Technologies for Music Education and Sound Creation” (2015-2016), led by Dr. Jorge Sastre. This project aims to continue developing and improving *Soundcool* as a modular software system based on low-cost interfaces such as tablets, smartphones and Kinect.
- Universitat Politècnica de València (Spain) project: “New Audiovisual Technologies and Interfaces for Education in Music and Sound Creation” (2013), directed by Jorge Sastre. This project led to the birth of *Soundcool*.

The following are two key publications:

- “New Technologies for Music Education”, Sastre, J. Cerdà, W. García, C.A. Hernández, N. Lloret, A. Murillo, D. Picó, J. E. Serrano, S. Scarani, R.B. Dannenberg. Presented on the 2nd International Conference on E-Learning and E-Technologies in Education (ICEEE2013), and considered one of the most relevant papers of the conference. Available at:
https://www.researchgate.net/publication/259900796_New_Technologies_for_Music_Education
- “Soundcool: New Technologies for Music Education”, J. Sastre, A. Murillo, E. Carrascosa, R. García, R.B. Dannenberg, N. Lloret, R. Morant, S. Scarani, A. Muñoz. Presented on the International Conference of Education, Research and Innovation ICERI2015. Available at:
https://www.researchgate.net/publication/284183213_SOUNDPOOL:_NEW_TECHNOLOGIES_FOR_MUSIC_EDUCATION

Requirements

For the *Soundcool* modules to operate properly, the following components are needed:

- **Max Runtime 6.** This program opens the *Soundcool* modules. It is free and can be found here (you must use **Max Runtime 6.1.10, not Max 7**):
<https://cycling74.com/downloads/runtime>
- **QuickTime.** This program is necessary because Max Runtime uses it to playback audio and video files. If it hasn't been installed, the modules may not be able to play these files. The program is free and can be downloaded here:
<http://www.quicktime.com>
- **TouchOSC.** Mobile application. It enables wireless control of modules, sending messages and receiving feedback from remote devices. The app costs 4.99€ (\$4.99) in your app store (currently available only for Android in Google Play and iOS in App Store). The use of *TouchOSC* is a temporary solution that will be substituted in the future by a free app that we are currently developing.
- **TouchOSC Editor.** Program to quickly load the *Soundcool* layout onto mobile devices. The program is free and can be found here:
<http://hexler.net/software/touchosc#downloads>
- **Kinect.** Microsoft's sensor that controls some *Soundcool* modules by using physical movement, as though the whole body is an instrument. The device model compatible with *Soundcool* is *Kinect for Xbox 360, Model 1414*.
- **Synapse.** Program to process movement detected by the *Kinect* sensor. Free download here: <http://synapsekinect.tumblr.com/post/6305020721/download>

Installation Instructions

1 - Install External Apps

Mac - OS X:

1. Install *Max Runtime 6.1.10* (not Max 7) for Mac
2. Install *TouchOSC Editor* for Mac

Windows: (check what program versions can run in your computer: 64 bit or 32 bit versions)

1. Install *Quicktime* for Windows
2. Install *Max Runtime 6.1.10* (not Max 7) for Windows
3. Install *TouchOSC Editor* for Windows.

At this point you can use *Soundcool* on your computer, even without using mobile devices or Kinect. For an example follow the tutorial described on the "Basic Operation" section below. If you have *Kinect for Xbox 360, Model 1414* available, you can install Synapse for using it with *Soundcool*.

2 - Install TouchOSC in your mobile device

[Only Android and iOS devices are supported]

1. Visit <http://soundcool.org/downloads> from your mobile device and click "Download TouchOSC for Android" or "Download TouchOSC for iOS" or search for "TouchOSC" in your app store.

The app costs 4.99€ (\$4.99). As mentioned above, the use of *TouchOSC* is a temporary solution that will be substituted in the future by a free app that we are currently developing.

3 - Install Soundcool system on your computer

1. Drag the folder named *Soundcool* to your desktop. This folder is in the .ZIP file you downloaded from the *Soundcool* website.

2. Drag *Soundcool_Layout_v1.0.touchosc* to your Desktop. This file is in the .ZIP file you downloaded from the *Soundcool* website.

4 - Install Soundcool Layout in your mobile device

1. Be sure your computer and your mobile device(s) are connected to the same wireless/Wi-Fi network.

2. Open TouchOSC Editor, click on “Open” and load the file *Soundcool_Layout_v1.0.touchosc* from your desktop. Click the *Sync* button.

3. Open TouchOSC in your mobile device. Go to *Layout* and click on “Add”. Your Host computer should appear in the list. If not, tap *Edit* and enter your computer’s internal IP address.

How to get your internal IP adress:

Windows: <https://www.youtube.com/watch?v=HsCD7hUISjk>

Mac OS X: <https://www.youtube.com/watch?v=1mjryJqYSQo>

4. Click on the computer’s name and the layout will automatically download.

5. Go back and select the layout *Soundcool_Layout_v1.0*. Press *Done*.

File Compatibility

Soundcool-compatible files are identical to *QuickTime*-compatible files:

Supported audio files	Supported video files
iTunes Audio (.m4a, .m4b, .m4p)	QuickTime Movie (.mov)
MP3	MPEG-4 (.mp4, .m4v)
Core Audio (.caf)	MPEG-2 (OS X Lion or later)
AIFF	MPEG-1
AU	3GPP
SD2	3GPP2
WAV	AVCHD (OS X Mountain Lion or later)
SND	AVI (only Motion JPEG)
AMR	DV

If you want to add more types of compatible files, such as *.wma*, *.wmv*, or *divx* or if *Quicktime* can’t open a file, then you may need to install additional codecs to *QuickTime*, by using the following link: <https://support.apple.com/en-us/HT201290> or searching “If QuickTime Player can’t open an audio or video file” in Apple Support <https://www.apple.com/support/>.

Basic operation

In this section you will be guided to produce your first sounds.



Modules

The *Soundcool* system consists of different **modules** that can be interconnected together to produce different effects and sounds. Modules are typically opened from Max Runtime software. All soundcool module names start by letter *M*. Now, you will open two modules, *MPlayer* and *MSpeakers*, by following these steps:

- Open Max Runtime (remember you installed it on step 1 of Installation Instructions).
- Go to *File* menu and select *Open...*
- Browse to the *Soundcool System* folder (remember you installed it on step 3 of Installation Instructions).
- Select the file named *MPlayer*

Similarly, open the file named *MSpeakers*.

Relocating a module

The modules can be placed on the screen wherever you want them. To change the location, hold the mouse cursor over the name of the module until the hand icon appears . By clicking and dragging, the module can then be moved to wherever desired. While doing this, the cursor will change to the image of a hand holding an object .

You can arrange the two modules as shown in the following figure:

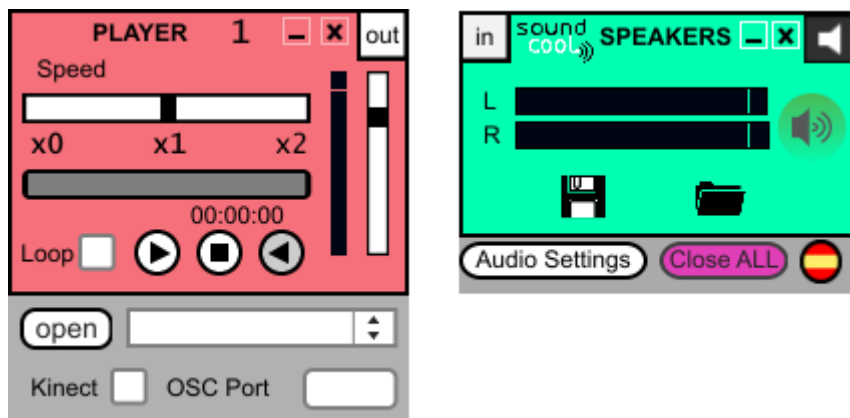




Figure 1: Two modules opened

Note that all modules generate an **identification** number, so that if two or more instances of the same module open up, each will be identified with a different number. If all instances of the same module close, the count is reset.

Connecting the two modules

Soundcool modules can have inputs and/or outputs. To **connect** the two modules, first click on the output button of *MPlayer*, labeled **out**, to activate it. After that, the originally square button becomes round . At the same time, the **in** button on the modules which are available

to be connected with it will become round . At this point, if you click on any of these *in* buttons, the connection between the two modules will be established. In our example, we only have the *in* button of *MSpeakers*.

Once connected, the output button will change to having a black background. In addition, the new input button will display the initial and identification number (here P1) and the background color of the module it originated from. The result can be seen in the following figure:

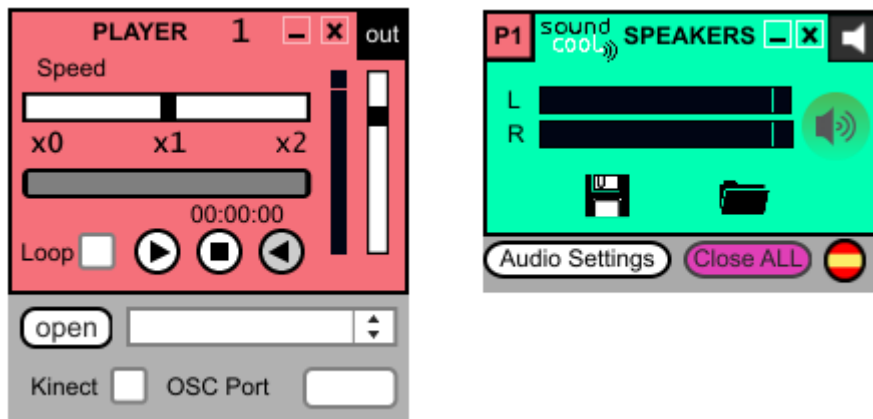



Figure 2: Connecting two modules

Producing the first sounds

To make this arrangement sound, follow these steps:

- Click the *Open* button of *MPlayer*.
- Select an audio file that is stored in your computer (Remember that you need to install Quicktime to playback audio files, and see *QuickTime*-compatible files above).
- Press the Play button .

Disconnecting modules

To disconnect two modules, simply hover over the *in* button. At that moment, an “X” will appear on the button. If you then click, the associated modules will be disconnected.

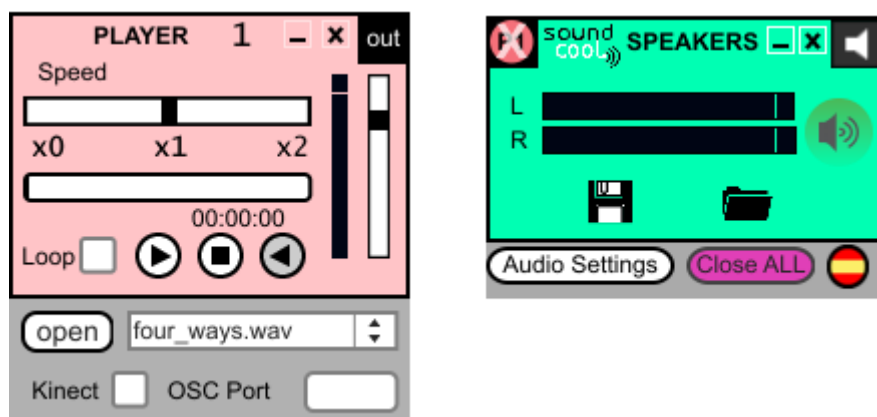


Figure 3: Disconnecting two modules

Also, if any module that is part of the connection is closed, the connection is automatically broken.

Multiple connections between modules

Now, we are going to make another arrangement using four modules. We will connect the *MPlayer* to two modules at the same time. This is because the output of an **out** button can be connected to one or more modules. In contrast, the **in** buttons only accept one connection. If you hold the mouse over the **in** button of certain module, the module which is connected to it will light up, and if you hover over the **out** button all the modules which are connected to it will light up.

In addition to the *MPlayer* and the *MSpeakers*, please, open the following modules: *MPitch* and *MMixer*. Initially, please, disconnect all the modules as explained above. The arrangement is shown in the next figure:

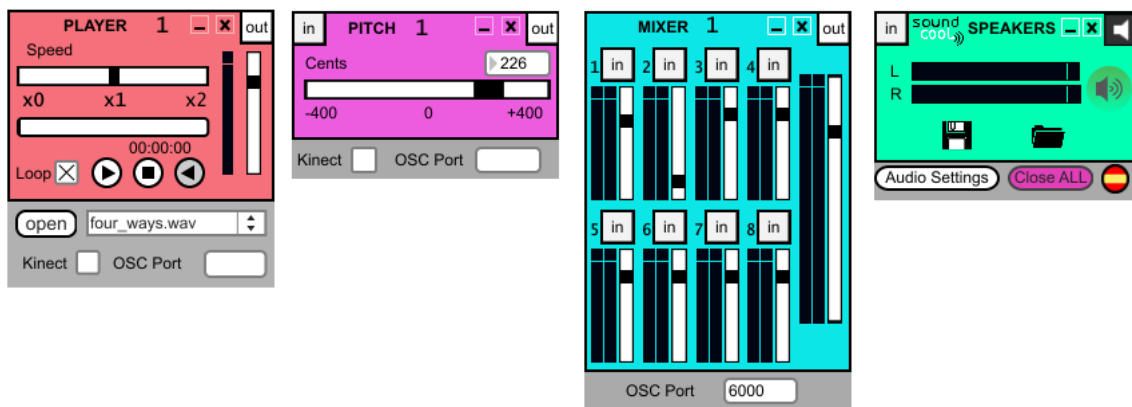


Figure 4: Arrangement disconnected

MPitch is an effect module that changes the pitch of its input. Similarly, *MMixer* has inputs and one output. Whatever is input into these kind of modules is processed and then output from the same module. In turn, whatever is output from any of those modules (usually audio) may lead into one or more other modules.

Please, make the following connections:

- *Mplayer's* output will have a multiple connection: one to the input of *MPitch* and the other to the input 1 of *MMixer*. Please, proceed as explained above for multiple connections.
- *MPitch's* output will be connected to the input 2 of *MMixer*.
- *MMixer's* output will be connected to the input of *MSpeakers*.

The arrangement is shown in the following figure:

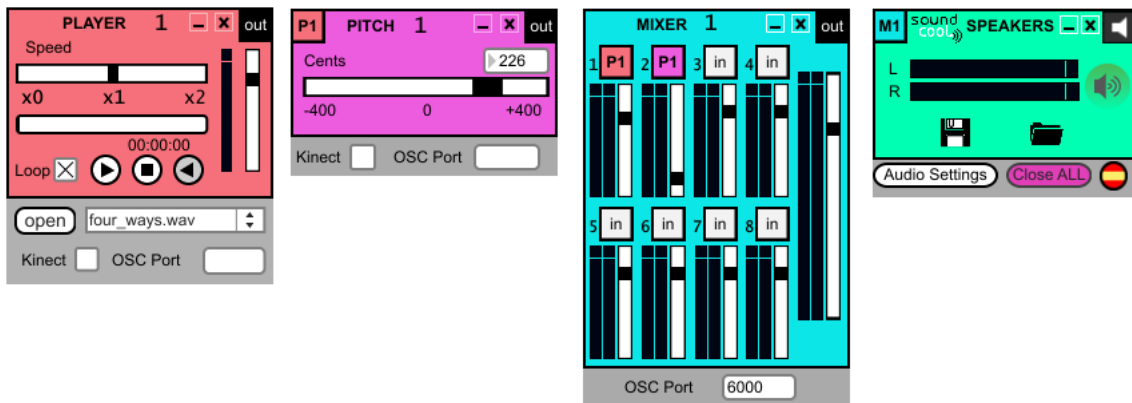


Figure 5: Arrangement with connections

Now, we have a typical arrangement where the original sound source and its processed version enter a mixer. By changing the levels of the mixer we can control the proportion of original and processed sound that we can listen through the speakers. That is, by increasing the volume of *MMixer's* channel 1 1 P1 you will hear the original sound louder, while by increasing the volume of *MMixer's* channel 2 2 P1 you will hear the effect, or processed sound, louder (move the Pitch 1 slider to change the pitch of the sound played by Player 1).

Please, note that we have not used the mobile devices, yet. That will be covered at the end of the manual.

Minimizing modules



All modules have a minimize button  which compacts all modules to the same size, no matter what size they were when maximized. Once minimized, you can return to the previous size by clicking on the maximize button . The following figure shows how several modules are minimized to the same size:



Figure 6: Minimized modules

This is part of Soundcool manual (see <http://soundcool.org> to access the complete manual). The next manual sections describe every *Soundcool* module in more detail, as a reference manual.