

# **Online Workshop: "Performing with a virtual agent: machine learning for live coding"**

## **Day 1**

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De Montfort University

L'ull cec 11.1.2021



[mirlca.dmu.ac.uk](http://mirlca.dmu.ac.uk)

## MIRLCAuto: A Virtual Agent for Music Information Retrieval in Live Coding

Partners: IKLECTIK, Leicester Hackspace, L'Ull Cec, Phonos, MTI<sup>2</sup>

Collaborators: TOPLAP Barcelona, FluCoMa, Freesound

Awarded with an EPSRC HDI Network Plus Grant

## Online Workshop Performing with a virtual agent: machine learning for live coding

**London (IKLECTIK)**  
7/9/11.12.2020 - 19:00-21:00 (GMT)

**Barcelona (L'Ull Cec)**  
11/13/15.1.2021 - 19:00-21:00 (CET)

**Leicester (Leicester Hackspace)**  
25/27/29.1.2021 - 19:00-21.00 (GMT)

More info at:  
[mirlca.dmu.ac.uk/workshops](http://mirlca.dmu.ac.uk/workshops)

### Partners

IKLECTIK [off-site]



phonos



### Collaborators

toplap



freesound



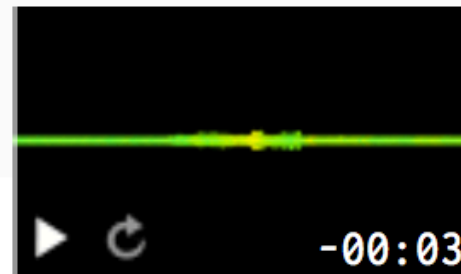
# Materials / Working Tools

- **SuperCollider Extensions:** <http://tiny.cc/lullcec-SC-extensions>
- **Working doc:** <https://pad.riseup.net/p/online-workshop-lullcec-keep>
- **Zoom / Zoom chat**
- **GitHub repo (tutorials, tickets):** <https://github.com/mirlca/lullcec-workshop>
- **Project website:** <https://mirlca.dmu.ac.uk>

# **An introduction to MIRLC: an easy live coding language to query sounds from [Freesound.org](https://freesound.org)**



## Random sound of the day



## Zip Opening

Portfolio zip opening

portfolio office zip opening



paulocorona

February 2nd,  
2016

266 downloads

2 comments



## Freesound Blog

## SIAS project: Sound Art in Colombia

July 6th, 2020 Proyecto SIAS

[Guest Blog post by Jorge Mario Díaz Matajira, director of the SIAS project] SIAS stands for "Information System about Sound Art in Colombia" (from the spanish "Sistema de Información sobre el Arte Sonoro en Colombia"). SIAS (<http://uan.sainethost.com/>) is a project that ... Continue reading → [Read Full Entry](#)

## Barcelona Confinement Soundscape

April 29th, 2020 ilaria

[Guest Blog post by Iliaria Sartori and Gianni Ginesi] Dear fellow Freesounders, May we introduce Barcelona Confinement Soundscape, a collaborative soundmap and soundscape-related network of researchers, artists and neighbors who stay home and actively listen, record and reflect on soundscape ... Continue reading → [Read Full Entry](#)

## Welcome to Freesound

Freesound is a collaborative database of Creative Commons Licensed sounds. Browse, download and share sounds.



## Support Us. Get your Freesound T-Shirt!

Select your store:

Europe

US Canada and Asia



Love Freesound?

Donate Now

## Active Forum Threads

## Welcome to Freesound Labs!

Freesound Labs is a listing of projects, hacks, apps, research and other stuff that use content from [Freesound](#) or use the [Freesound API](#). Want to add something missing in the list? Send us an email at [freesound@freesound.org](mailto:freesound@freesound.org)!



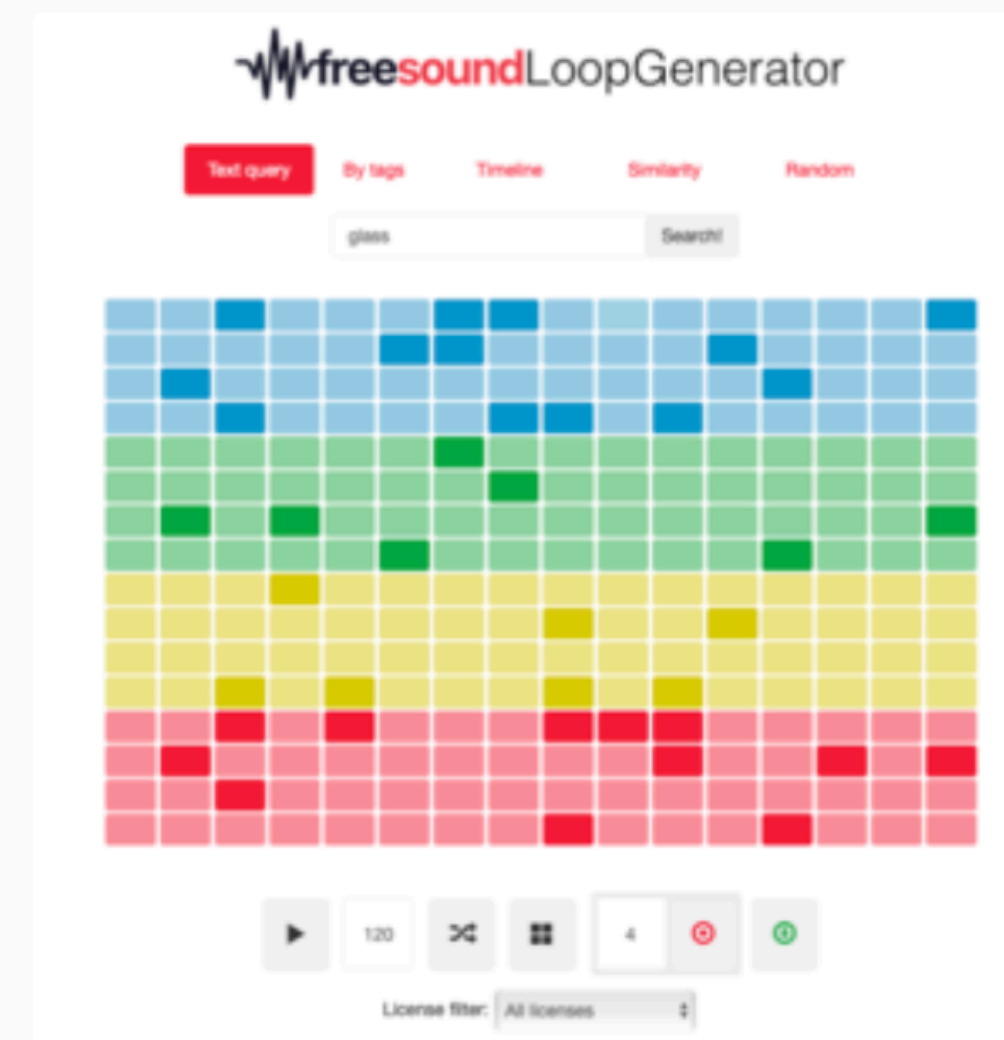
page 1 of 10 >>

### Freesound Loop Generator

The Freesound Loop Generator (FLG) is a tool to create music loops using Freesound sounds. It contains a 16 pads, a simple 16-step sequencer and several methods to load Freesound sounds into the pads. FLG...

[music-hackday](#) [drum-machine](#) [music-creation](#) [freesound-api](#)

<https://ffont.github.io/freesound-loop-generator>



**<https://labs.freesound.org>**  
**<https://freesound.org/docs/api/>**



g-roma / **Freesound.sc**

Watch

1

Unstar

7

Fork

1

<> Code

Issues 1

Pull requests 1

Actions

Projects

Wiki

Security

Insights

master 1 branch 0 tags

Go to file

Add file

Code

g-roma change single for double quotes for windows compatibility 6746012 4 days ago 5 commits

HelpSource	added comment about old keys	5 years ago
Freesound.quark	some bug fixes	5 years ago
Freesound.sc	change single for double quotes for windows compatibility	4 days ago
Readme.md	added comment about old keys	5 years ago

Readme.md

## Freesound.sc

### SuperCollider client for freesound.org

Freesound.org is a collaborative database of sound samples licensed under Creative Commons, supported by the Music Technology Group at Universitat Pompeu Fabra (Barcelona). In its current implementation, Freesound.org provides a web API based on REST principles. The general documentation for the API can be found at <http://www.freesound.org/docs/api/>. This quark provides a client for accessing the Freesound API from within SuperCollider. For the moment, only the Sound resource is supported. Prospective users are advised to apply for an API key at <http://www.freesound.org/api/apply/>. Being a web API, this form expects you to fill information about a hypothetical web application, but there is no restriction for using the API for music creation or performance. For general discussion about the API, join the google group: <http://groups.google.com/group/freesound-api>.

The API provides several response formats, but JSON is generally preferred. This quark provides a convenience wrapper around the most important calls by requesting resources via curl, and mapping JSON responses to SC Dictionary objects.

About

SuperCollider client for the Freesound API

Readme

Releases

No releases published

Packages

No packages published

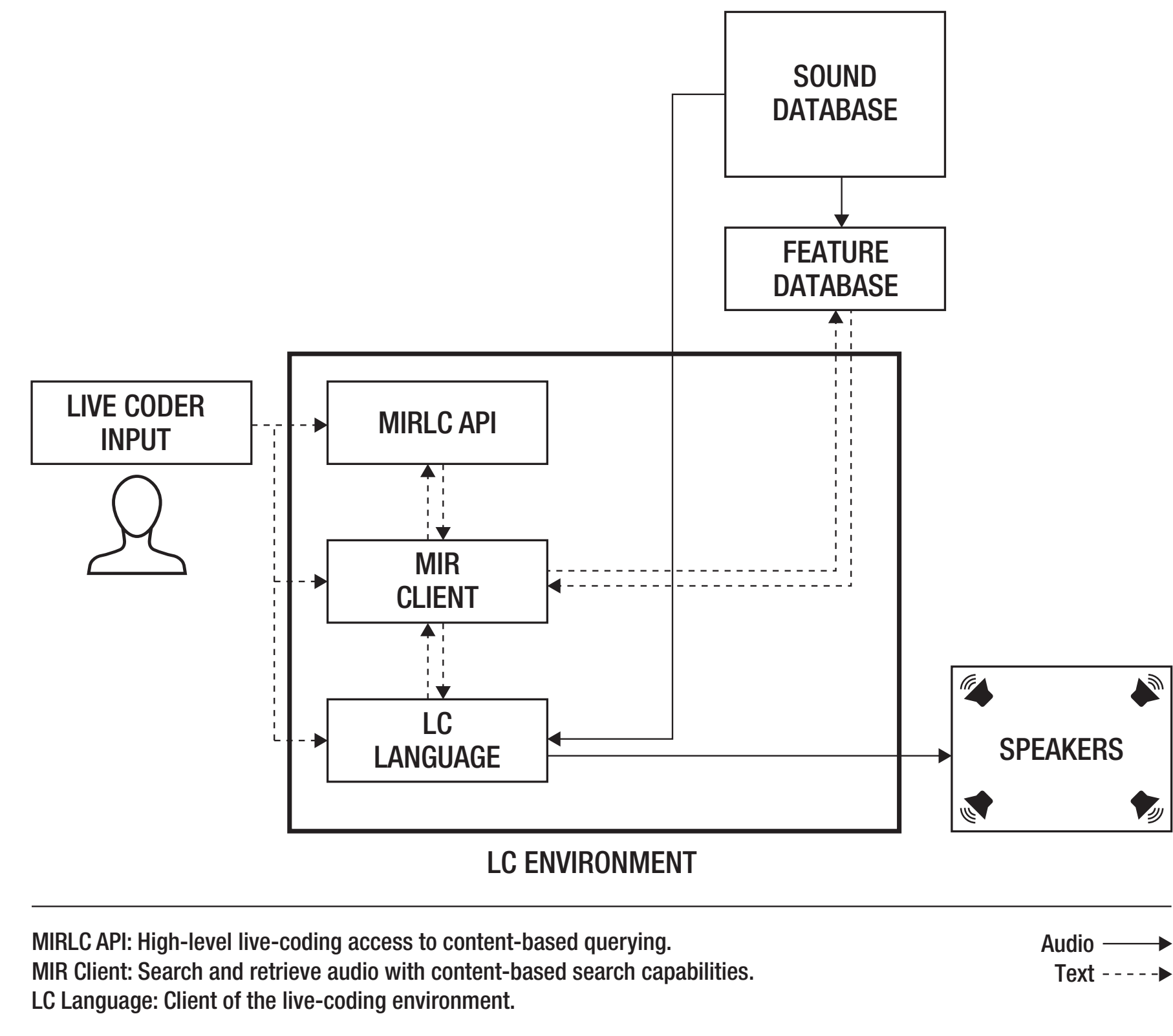
Languages

SuperCollider 100.0%

<https://github.com/g-roma/Freesound.sc>

# MIRLCRep

- Provides a high-level musical approach to operate with audio clips in live coding using music information retrieval techniques.
- Mid- and high-level content-based queries (e.g., duration, bpm, pitch, key, or scale) and text-based queries (i.e., tags).
- Use of an online database with preanalyzed audio features.
- It is designed for repurposing audio samples from Freesound using SuperCollider.
- Demo: <https://vimeo.com/249968326> (8:36)



Xambó, A., Lerch, A. and Freeman, J. (2019). "Music Information Retrieval in Live Coding: A Theoretical Framework". *Computer Music Journal*, 42(4), Winter 2018, pp. 9-25.

Xambó, A., Roma, G., Lerch, A., Barthet, M., Fakekas, G. (2018) "Live Repurposing of Sounds: MIR Explorations with Personal and Crowdsourced Databases". In *Proceedings of the New Interfaces for Musical Expression (NIME '18)*. Blacksburg, Virginia, USA. pp. 364-369.



```
// instantiation
~a = MIRLCRep.new
~b = MIRLCRep.new

// GET SOUNDS BY TEXT

// getsound(id=31362, size=1)
~a.id(323399)
~a.id(19246)
~a.id(19247)
~b.id(19248)
~b.id(192468)

// random(size=1)
~a.random
~a.random(2)
~a.random(3)
~b.random

// tag(tag="noise", size=1)
~a.tag("nail", 3)
~a.tag("chimes", 2)
~a.tag("noise", 2)
~a.tag("hammer", 2)
~b.tag("grain", 2)
~b.tag("humming", 3)
```

# MIRLCRep 1.0

```
// GET SOUNDS BY CONTENT & GET SOUNDS BY CONTENT WITH FILTER

// content(size=1, feature = 'dur', fvalue = 1, fx = 'conf', fxvalue = 'hi')
~a.content // sounds of 1 sec of duration
~a.content(1, 'dur', 10) // sounds of 10 sec of duration
~a.content(1, 'dur', 1, 'key', 'A')
~a.content(1, 'dur', 4, 'scale', 'minor')
~a.content(1, 'dur', 1, 'conf', 'lo')
~a.content(2, 'pitch', 100, 'conf', 'lo')
~a.content(1, 'key', 'Asharp')
~a.content(5, '.lowlevel.spectral_complexity.mean:', 1, 'conf', '[0 TO 0.3]') // Using directly Essentia's format
~b.content(1, 'bpm', 120)


// GET SIMILAR SOUNDS BY EXAMPLE

// similar(targetnumsnd=0, size=1)

~a.similar
~a.similar(0)
~a.similar(0, 2)
~b.similar(1)


// GET SIMILAR SOUNDS BY FILTER

// filter (targetnumsnd=0, size=1, fx = 'conf', fxvalue = 'hi')

~a.content(1, 'dur', 4, 'scale', 'minor')
~a.filter(1, 1, 'conf', 'lo')
~a.filter(1, 1, 'conf', 'hi')
~a.filter(2, 1, 'conf', 'hi')

~b.content(1, 'dur', 2)
```

# MIRLCRep 1.0

# MIRLCRep: Music Improvisation

## by Jack Armitage

### Sound samples used:

Ambience, Jacksonville Zoo, A.wav by InspectorJ <https://freesound.org/people/InspectorJ/sounds/400831/>  
Birds Singing 03.wav by DCPoke <https://freesound.org/people/DCPoke/sounds/387978/>  
Birds in the forest.wav by straget <https://freesound.org/people/straget/sounds/402809/>  
Bird Whistling, Single, Robin, A.wav by InspectorJ <https://freesound.org/people/InspectorJ/sounds/416529/>  
Wind long.ogg by vandale <https://freesound.org/people/vandale/sounds/379465/>  
Children screaming in a Pirate Ship Playground, church bell in background by felix.blume <https://freesound.org/people/felix.blume/sounds/410518/>  
Ambience, Children Playing, Distant, A.wav by InspectorJ <https://freesound.org/people/InspectorJ/sounds/398160/>  
lawnmower.wav by gadzooks <https://freesound.org/people/gadzooks/sounds/20737/>  
Cat, Screaming, A.wav by InspectorJ <https://freesound.org/people/InspectorJ/sounds/415209/>  
High Street of Gandia (Valencia, Spain) by Jormarp <https://freesound.org/people/Jormarp/sounds/207208/>  
Dog Barking, Single, A.wav by InspectorJ <https://freesound.org/people/InspectorJ/sounds/406085/>  
TRAIN\_VOICE.mp3 by Manicciola <https://freesound.org/people/Manicciola/sounds/173314/>  
Walking in Long Grass.wav by Leafs67 <https://freesound.org/people/Leafs67/sounds/155589/>  
Group\_of\_Dogs\_Barking.WAV by ivolipa <https://freesound.org/people/ivolipa/sounds/337101/>  
Dog Barking, Single, A.wav by InspectorJ <https://freesound.org/people/InspectorJ/sounds/406085/>  
Two Barks.wav by Puniho <https://freesound.org/people/Puniho/sounds/115536/>  
cat meow II by tuberatanka <https://freesound.org/people/tuberatanka/sounds/110010/>  
Cat, Screaming, A.wav by InspectorJ <https://freesound.org/people/InspectorJ/sounds/415209/>  
cat meow by tuberatanka <https://freesound.org/people/tuberatanka/sounds/110011/>  
Ambience, London Street, A.wav by InspectorJ <https://freesound.org/people/InspectorJ/sounds/398159/>  
High Street of Gandia (Valencia, Spain) by Jormarp <https://freesound.org/people/Jormarp/sounds/207208/>  
On A Bus by thef1like <https://freesound.org/people/thef1like/sounds/412932/>  
political\_discussion(IT) by Manicciola <https://freesound.org/people/Manicciola/sounds/182860/>  
TRAIN\_VOICE.mp3 by Manicciola <https://freesound.org/people/Manicciola/sounds/173314/>  
Inside Car Ambience Next to School More Quiet Version.wav by 15050\_Francois [https://freesound.org/people/15050\\_Francois/sounds/326146/](https://freesound.org/people/15050_Francois/sounds/326146/)  
Heavy Rain by lebcraftlp <https://freesound.org/people/lebcraftlp/sounds/243627/>  
Train upon us.wav by markedit <https://freesound.org/people/markedit/sounds/157873/>  
Large\_crowd\_medium\_distance\_stereo.wav by eguobyte <https://freesound.org/people/eguobyte/sounds/360703/>  
On A Bus by thef1like <https://freesound.org/people/thef1like/sounds/412932/>  
Coffee Maker by Villaperros <https://freesound.org/people/Villaperros/sounds/170621/>  
London Underground, Arriving, A.wav by InspectorJ <https://freesound.org/people/InspectorJ/sounds/401989/>  
German / English Airport Announcement by euromir <https://freesound.org/people/euromir/sounds/256878/>  
tannoying remix of 245957\_kwahmah-02\_tannoy-chime-05.flac by Timbre <https://freesound.org/people/Timbre/sounds/246322/>  
Spaceship Fly-by, A by InspectorJ <https://freesound.org/people/InspectorJ/sounds/397948/>  
plane.wav by inchadney <https://freesound.org/people/inchadney/sounds/275138/>  
20070117.takeoff.wav by dobroide <https://freesound.org/people/dobroide/sounds/29612/>



# **MIRLCRep: Music Improvisation**

## **by Alo Allik**

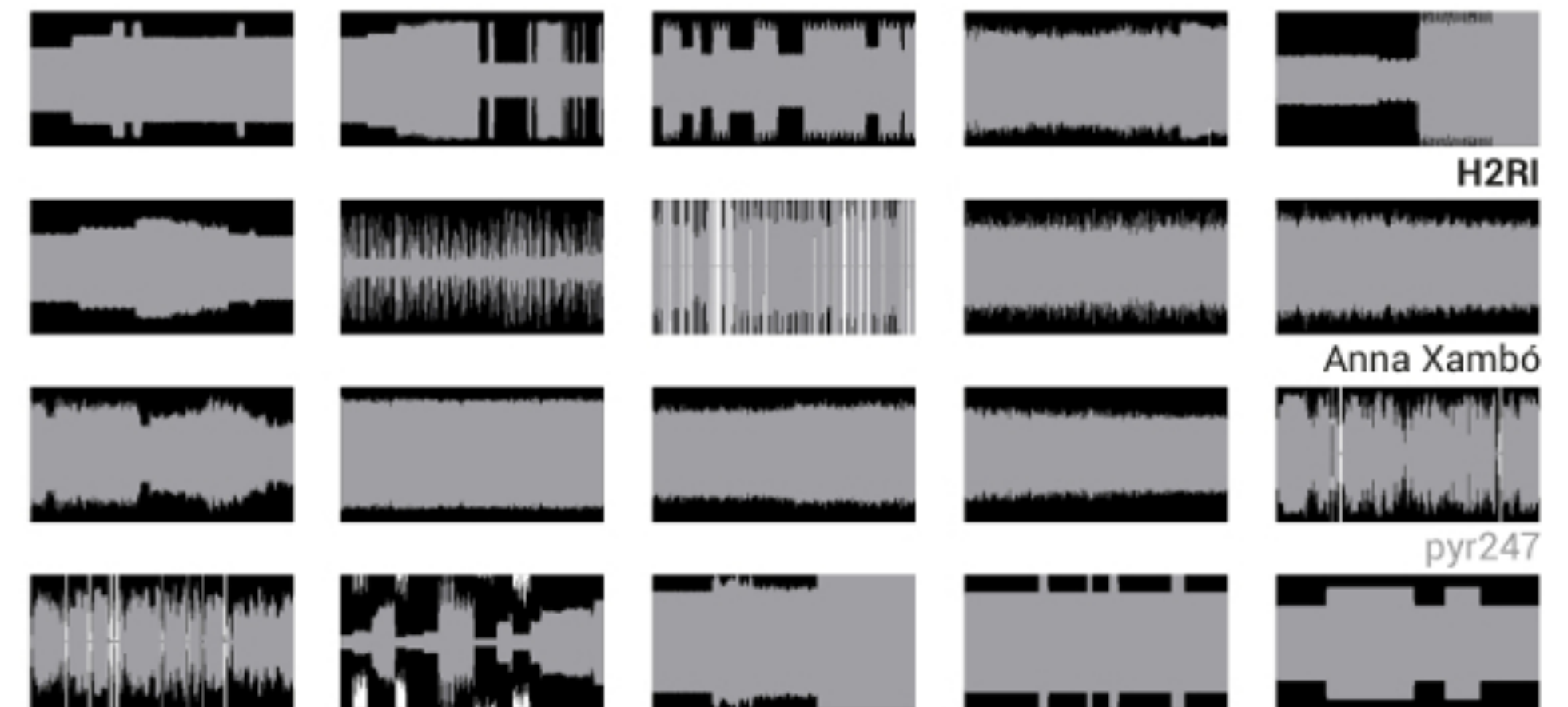
### **Sound samples used:**

**Rainstick 2.wav by gevaroy <https://freesound.org/people/gevaroy/sounds/347380/>**  
**Instrument\_rainstick.aif by vrodge <https://freesound.org/people/vrodge/sounds/119547/>**  
**Glass Smash, Bottle, E.wav by InspectorJ <https://freesound.org/people/InspectorJ/sounds/344272/>**  
**sword\_01.wav by dermotte <https://freesound.org/people/dermotte/sounds/263015/>**  
**Footsteps, Ice, A.wav by InspectorJ <https://freesound.org/people/InspectorJ/sounds/338265/>**  
**Celery crunch.wav by xenognosis <https://freesound.org/people/xenognosis/sounds/137228/>**  
**b1.wav by deleted\_user\_2195044 [https://freesound.org/people/deleted\\_user\\_2195044/sounds/243212/](https://freesound.org/people/deleted_user_2195044/sounds/243212/)**  
**Bullroarer by m.newlove <https://freesound.org/people/m.newlove/sounds/242926/>**  
**Didgeridoo, A.wav by InspectorJ <https://freesound.org/people/InspectorJ/sounds/398272/>**  
**Infrasound - 12hz - Sine Wave.wav by Headphaze <https://freesound.org/people/Headphaze/sounds/235209/>**  
**Infrasound - 20hz - Sine Wave.wav by Headphaze <https://freesound.org/people/Headphaze/sounds/235212/>**  
**Laser/Machine humming by Shredster7 <https://freesound.org/people/Shredster7/sounds/166098/>**  
**bit.aif by matthewgeorge <https://freesound.org/people/matthewgeorge/sounds/34909/>**  
**Infrasound - 12hz - Sine Wave.wav by Headphaze <https://freesound.org/people/Headphaze/sounds/235209/>**  
**Apple crunch.wav by xenognosis <https://freesound.org/people/xenognosis/sounds/137231/>**  
**Eating chips by giddster <https://freesound.org/people/giddster/sounds/383398/>**  
**Boots on Scree going downhill.wav by corble <https://freesound.org/people/corble/sounds/402846/>**  
**Glass Smash, Bottle, E.wav by InspectorJ <https://freesound.org/people/InspectorJ/sounds/344272/>**

# H2RI (pan y rosas, 2018)

*H2RI is an instance of a generative album created by Anna Xambó in 2018. The 20 tracks of 1' each have been generated using her self-built tool MIRLC, a library for using music information retrieval techniques in live coding. A basic rule has shaped the audio sources of the album: the only use of sounds of short duration from the crowdsourced online sound database Freesound. Each track is complemented with the code in SuperCollider and the attribution to the authors of the original sounds.*

*Website: [www.panyrosasdiscos.net/pyr247-anna-xambo-h2ri](http://www.panyrosasdiscos.net/pyr247-anna-xambo-h2ri)*



```

a = MIRLCRep.new

s.record

(
var index = 0;
t = Routine({
  var delta, dur;
  loop {
    index = index + 1;
    delta = rrand(0.4, 4);
    dur = rrand(0.01, 0.04);
    if ( [false, true].choose,
        {a.content(2, 'dur', dur, 'conf', 'lo');},
        { a.solo(rrand(1,index)) }
    );
    delta.yield;
  }
});
)

t.play

```



postrockcafe, A Closer Listen, May 30, 2018

(...) The mind struggles to make sense of these tracks, hearing Atari beeps in the fifth track, a teletype machine in the seventh, a hearing test in the closing duo. Once tentative assignments are achieved, the noise no longer sounds like noise. The same process holds true for those acclimating to the sound of cities: after a while, we no longer hear the machines.

```
Equinox-22-03-2020-19-30.scd
31
32 // Hello !
33
34
35
36
37
38
39 // Tag
40
41 a.tag("morse"+"two")
42
43
44 b|
45
46
47
48 c
49
50
51 d
52
53
54 e
55
56
:: Anna Xambó ::
```

```
Post window
server 'localhost' already booting
server 'localhost' already booting
server 'localhost' already booting
server 'localhost' already booting
server 'localhost' already booting
server 'localhost' already booting
server 'localhost' already booting
server 'localhost' already booting
-> a MIRCRep2
Bootting server 'localhost' on address 127.0.0.1:57110.
Found 0 LADSPA plugins
Number of Devices: 8
0 : "Built-In Microph"
1 : "Built-In Output"
2 : "Scarlett 6i6 USB"
3 : "BlackHole 16ch"
4 : "Soundflower (2ch)"
5 : "Soundflower (64ch)"
6 : "ZoomAudioDevice"
7 : "Multi-Output Device"

"Scarlett 6i6 USB" Input Device
Streams: 1
0 channels 6

"BlackHole 16ch" Output Device
Streams: 1
0 channels 16

SC_AudioDriver: sample rate = 44100.000000, driver's block size = 512
SuperCollider 3 server ready.
Requested notification messages from server 'localhost'
localhost: server process's maxLogins (1) matches with my options.
localhost: keeping clientID (0) as confirmed by server process.
Shared memory server interface initialized
Sounds selected by tag: 1
curl -H 'Authorization: Token 5a837b803eb5a6da25dd3b42346fd6550080b919' 'https://www.free
-> a MIRCRep2
{"count":7,"next":null,"results":[{"id":47487,"name":"sw-13.wav","tags":["electronic","morse","noise"],
found sound by tag, id: 47487name: sw-13.wav
curl -H 'Authorization: Token 5a837b803eb5a6da25dd3b42346fd6550080b919' 'https://www.free
{"id":47487,"url":"https://freesound.org/people/galeku/sounds/47487/","name":"sw-13.wav","tags"
curl -H 'Authorization: Token 5a837b803eb5a6da25dd3b42346fd6550080b919' 'https://freesound
[0]: id: 47487 name: sw-13.wav by: galeku dur: 83.5293

Interpreter: Active Server: 0.22% 0.29% 8u 1s 52g 134d 0.0dB M R
```

“Crowdsourced Eulerisms”. Eulerroom Equinox 2020.  
Streaming from Sheffield, UK. March 23, 2020.

# MIRCRep 2.0

**Next:**  
**Live Tutorials by Sam Roig**