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

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

Partners: IKLECTIK, Leicester Hackspace, L'Ull Cec, Phonos, MTI²

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

Partners

IKLECTIK [off-site] · phonos · MTI² INSTITUTE FOR SONIC CREATIVITY

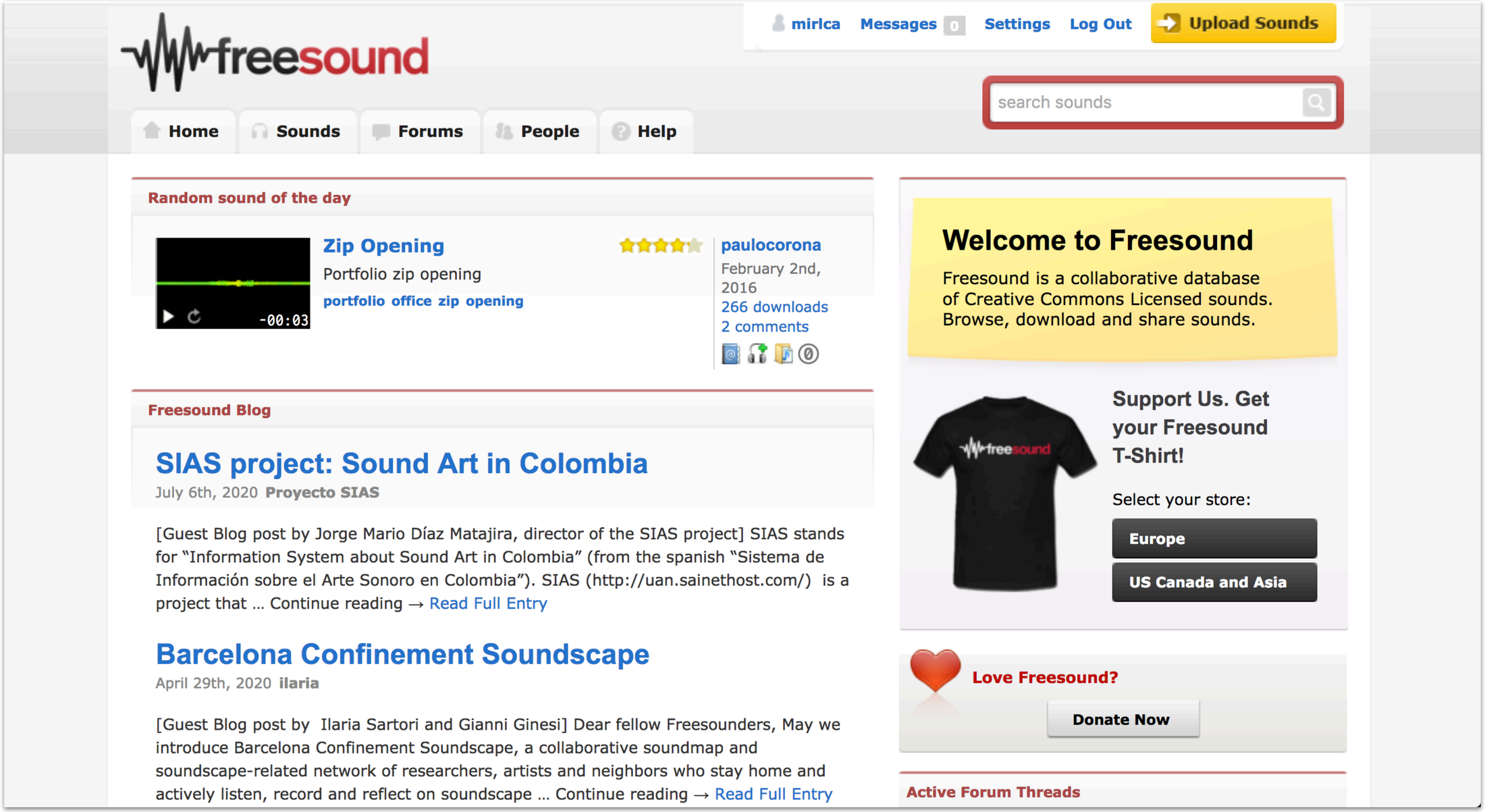
Collaborators

toplap BCN · 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

freesoundLabs

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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!

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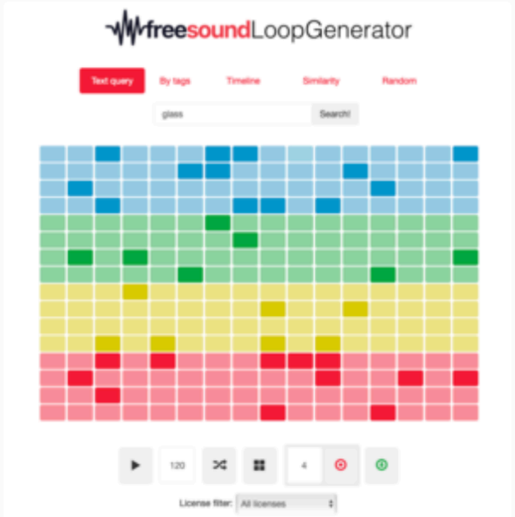
page 1 of 10 >>

Freesound Loop Generator

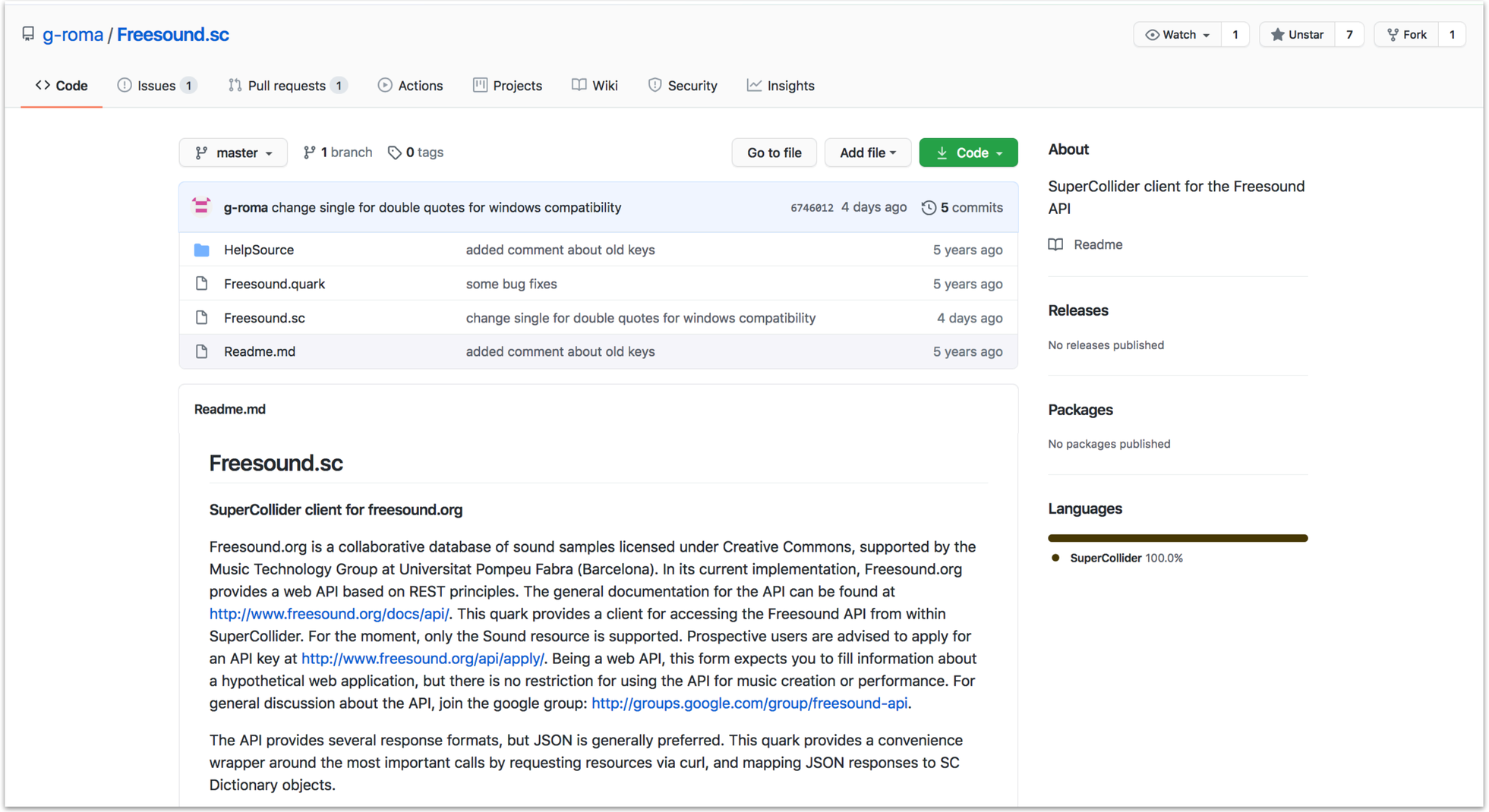
The Freesound Loop Generator (FLG) is a tool to create music loops using Freesound sounds. It contains a 16 pads, a simple 16-step sequencer and several methods to load Freesound sounds into the pads. FLG...

music-hackday drum-machine music-creation freesound-api

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



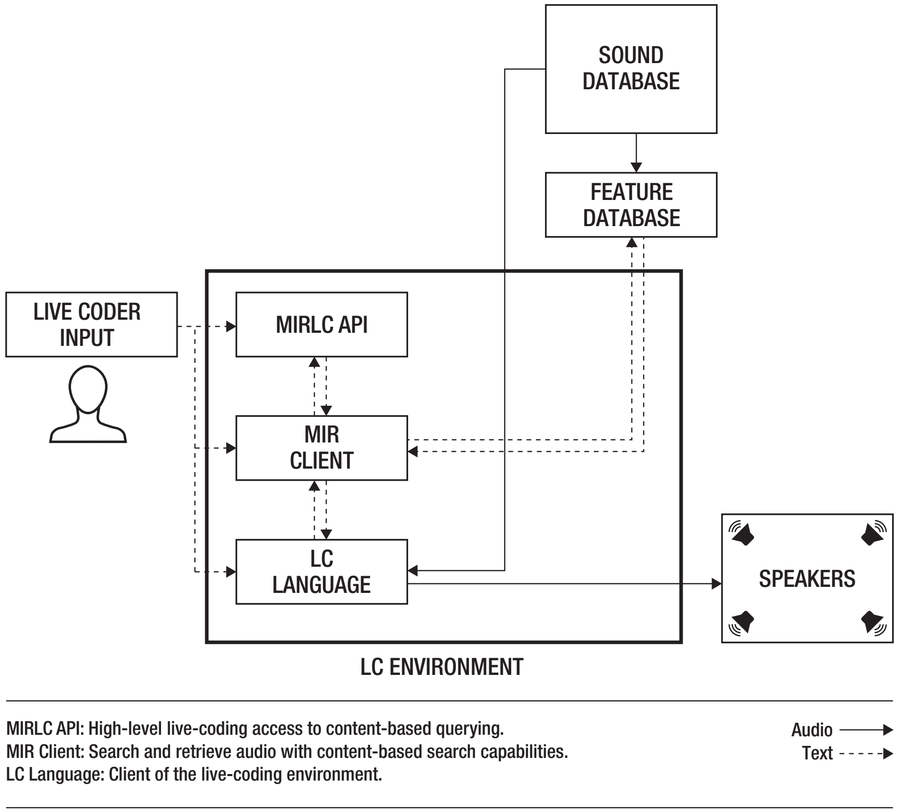
https://labs.freesound.org
https://freesound.org/docs/api/



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/
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/

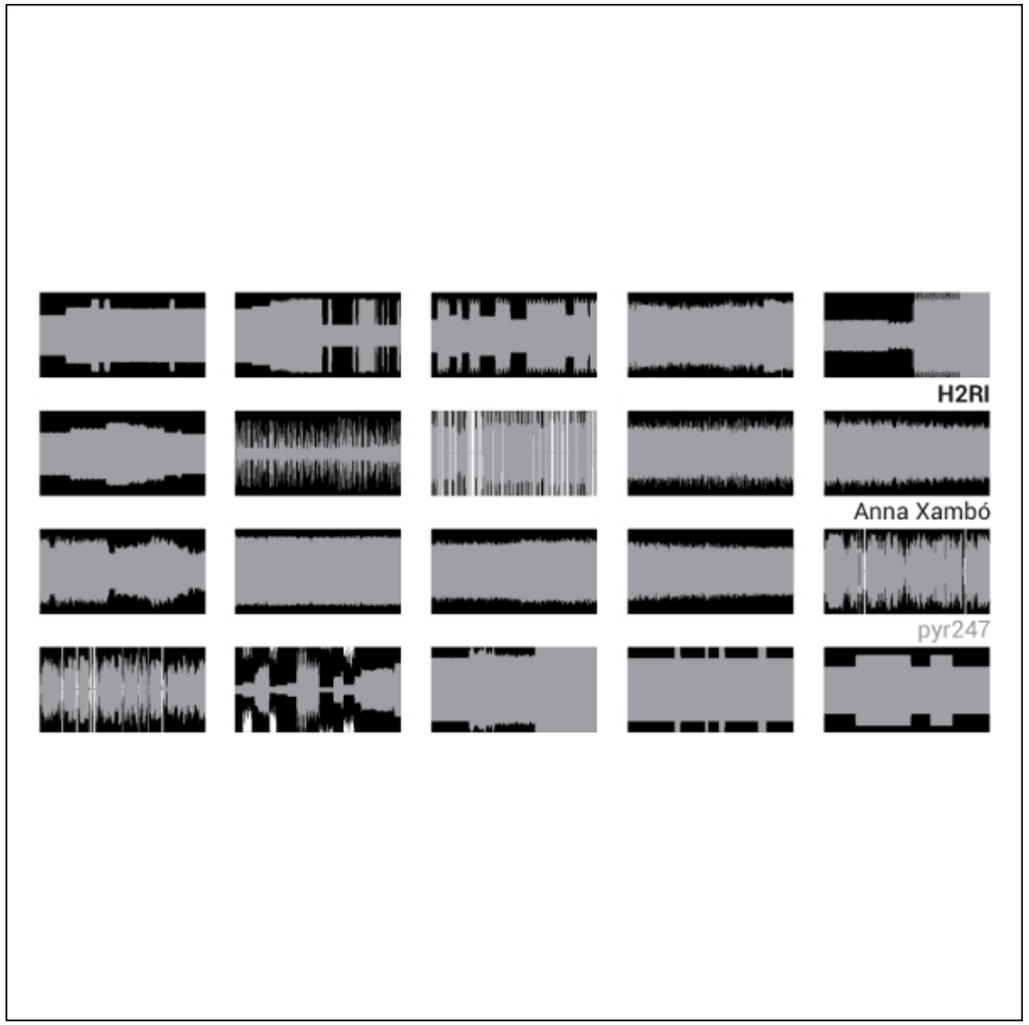
MIRLCRep: Music Improvisation
by Alo Allik

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/
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



```
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
```

H2RI.17

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.

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

MIRLCRep 2.0

Next:
Live Tutorials by Sam Roig