



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

Day 1

Anna Xambó

Music, Technology and Innovation - Institute for Sonic Creativity (MTI²)
De Montfort University

Leicester Hackspace 25.1.2021



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

Partners

IKLECTIK [off-site]



phonos



Collaborators

toplaphbcn



freesound

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

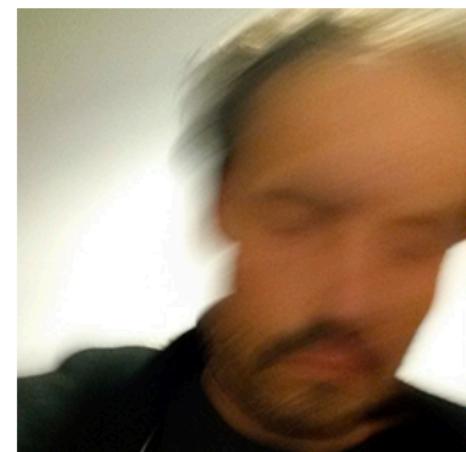
Team



Anna Xambó is a Senior Lecturer in Music and Audio Technology at De Montfort University, a member of Music, Technology and Innovation - Institute of Sonic Creativity (MTI^A2), and an experimental electronic music producer. Her research and practice focus on sound and music computing systems looking at novel approaches to collaborative, participatory, and live coding experiences. She is PI of the EPSRC HDI Network Plus funded project "MIRLCAuto: A Virtual Agent for Music Information Retrieval in Live Coding", investigating the use of a live coder virtual agent and the retrieval of large collections of sounds.
annaxambo.me



Active as an experimental music maker, **Ángel Faraldo** extends his work with sound installations, site-specific actions and sound design for dance and opera. He is interested in processes that maximise minimal resources, developing a critical and ecological perspective of live-electronic music, as materialised in his cycle The Feedback Study Series, his digital synthesiser MISS or his approach towards the no-input-mixer. Furthermore, he does significant labor performing and producing live-electronic music, especially as a member of Vertixe Sonora Ensemble, and as artistic director of the Phonos Foundation in Barcelona. He has studied at the Royal Conservatoire of Music (Madrid) and the Institute of Sonology (The Hague), obtaining his PhD degree from the Music Technology Group at Pompeu Fabra University (Barcelona), where he is currently a teaching associate.
www.angelfaraldo.info | www.upf.edu/web/phonos



Since 2006, helped by a fuzzy network of collaborators, **Sam Roig** has been directing l'ull cec, a cultural organization that has produced a wide assortment of public events and artistic projects related to sonic arts and experimental music, as well as dissemination activities around audio technology topics related to these disciplines. He is currently a PhD candidate at the University of Huddersfield and co-organises the MIRLCAuto's project workshops.
lullcec.org



Richard Forrest is a retired Electronics / Software engineer who worked in the Automotive and Aerospace industries. He is a member of Leicester Hackspace which is a venue for people to pursue their creativity in digital, electronic, mechanical and computer projects. He has just launched his own embedded software consultancy which offers to design embedded software using techniques that Richard has developed using the experience he has gained during his working career. Richard has performed music as a violin player in a symphony orchestra and as a chorister, having sung all the harmony parts at different times during his life. He has an appreciation of classical, modern, jazz, film and television theme music and a good grasp of music theory.
leicesterhackspace.org.uk
zoag.net



Eduard Solaz founder and director of IKLECTIK, London. IKLECTIK focuses on experimentation in arts, sound art, installation and cross disciplinary works. They expand their space as a research arts laboratory where interdisciplinary lines can overlap to create projects that explore processes and techniques, address social, political, cultural and critical issues.
iklectikoffsite.org



Tony Abbey is a retired Space Electronics engineer specialising in cooled CCD cameras for X-ray astronomy at Leicester University. Now volunteering at The National Museum of Computing at Bletchley Park where he is helping to rebuild the 1949 Valve Computer - EDSAC which kickstarted computing in the UK. Helped start up Leicester Hackspace where he was a director and is now company secretary. Interested in electronic music from a teenager. Built his first transistor oscillator keyboard instrument in the 1960's so he could play 'Telstar' by the Tornados. He became interested in electronic music at Southampton Uni where he did an Electronic Engineering degree and have the LP of 'Switched on Bach' by Walter Carlos (later Wendy Carlos). Fan of Kraftwerk and the Pet Shop Boys. He wants to learn if the on-line composing project is music as he would define it.
leicesterhackspace.org.uk



Isa Ferri is IKLECTIK's assistant curator and sound engineer. After obtaining her Master in Collection and Exhibition Registrar (2009), she started her career working for Massimo De Carlo and Massimo Minini Gallery, for then specialising in production and development of automated artworks facilitating the meeting of Engineering and Art. In 2017 she got the Diploma in 'Music Technology and Production' becoming permanent part of the IKLECTIK team in London and of the Sziget Festival Main Stage Sound Engineering team in Budapest.
iklectikoffsite.org

<https://mirlca.dmu.ac.uk/team/>



IKLECTIK [off-site]

Collaboration with IKLECTIK in *virtual* London

Two performances and a Q&A panel with
Sam Roig (moderator), Iván Paz (panelist), Gerard Roma (panelist/performer), Anna Xambó (panelist/performer)
<https://youtu.be/ZRqNfgg1HU0>



File Edit Options Buffers Tools SCLang Help

```
// different similar sounds

s.boot;

p = "/home/hvillase/Escritorio/MIRLCa/";
a = MIRLCa.new(path: p);

a.random
a.similar(1)
a.delay
a.play
a.autochopped(36, 4)
a.mute
a.fadeout(4)

b = MIRLCa.new(path: p)
b.random
b.similar

-:**- different-similar-sounds.scd All L18 (SCLang)
now playing...[0]: id: 276150 name: Coins_Single_10.wav by: Little
Synth('synth_mono_fs' : 1014)
now playing...[1]: id: 8364 name: HTickC.aiff by: hanstimm dur:
Synth('synth_mono_fs' : 1015)
now playing...[2]: id: 100040 name: saz_hyena.wav by: soundbytez
Synth('synth_mono_fs' : 1016)
Play backwards <<
localhost (127.0.0.1) 1.8|1.8 % u: 95 s: 29 g: 6 d: 296
```

File Edit View Selection Find Packages Help

QBRNTHSS_MIRLC.scd tidal.scd sclang://localhost:57120

```
1
2 p = "/home/rcasamajo/MIRLC2/"; // Define a patch for out data
3
4 // Hi! This is a little test of how to integrate the use of MIRLC
5 // with Tidal Cycles (the language I usually use to live coding)
6
7 a = MIRLCa.new(path: p);
8 a.tag("voice");
9 a.similar;
10 a.similarauto(0,3,10);
11 a.solo();
12 a.mute(6);
13 a.stop;
14 a.info;
15 a.play;
16 a.playauto // args: |times = 4, tempo = 30|
17
```

scratch.tidal

```
1 -- tempo
2 setcps (140/60)
3
4 hush
5
6 d2
7 -- $ sometimes (# coarse 15)
8 $ pan "0.5*12"
9 # s (slow 5 $ (segment 1 $ choose ["Fairchild808:3","glitchtoys:3","vermonaDM:3"])
10 # gain (range 0 0.85 $ slow 5 $ tri)
11 # pan (slow 2 $ (segment 1 $ rand))
12 # ...+ 1
```

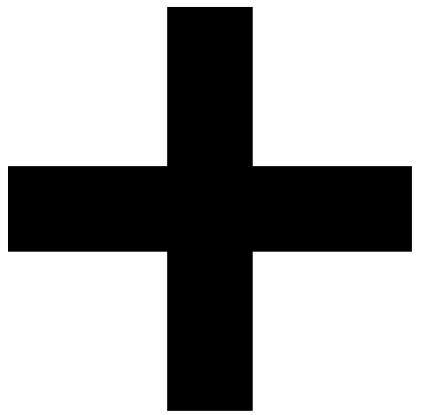
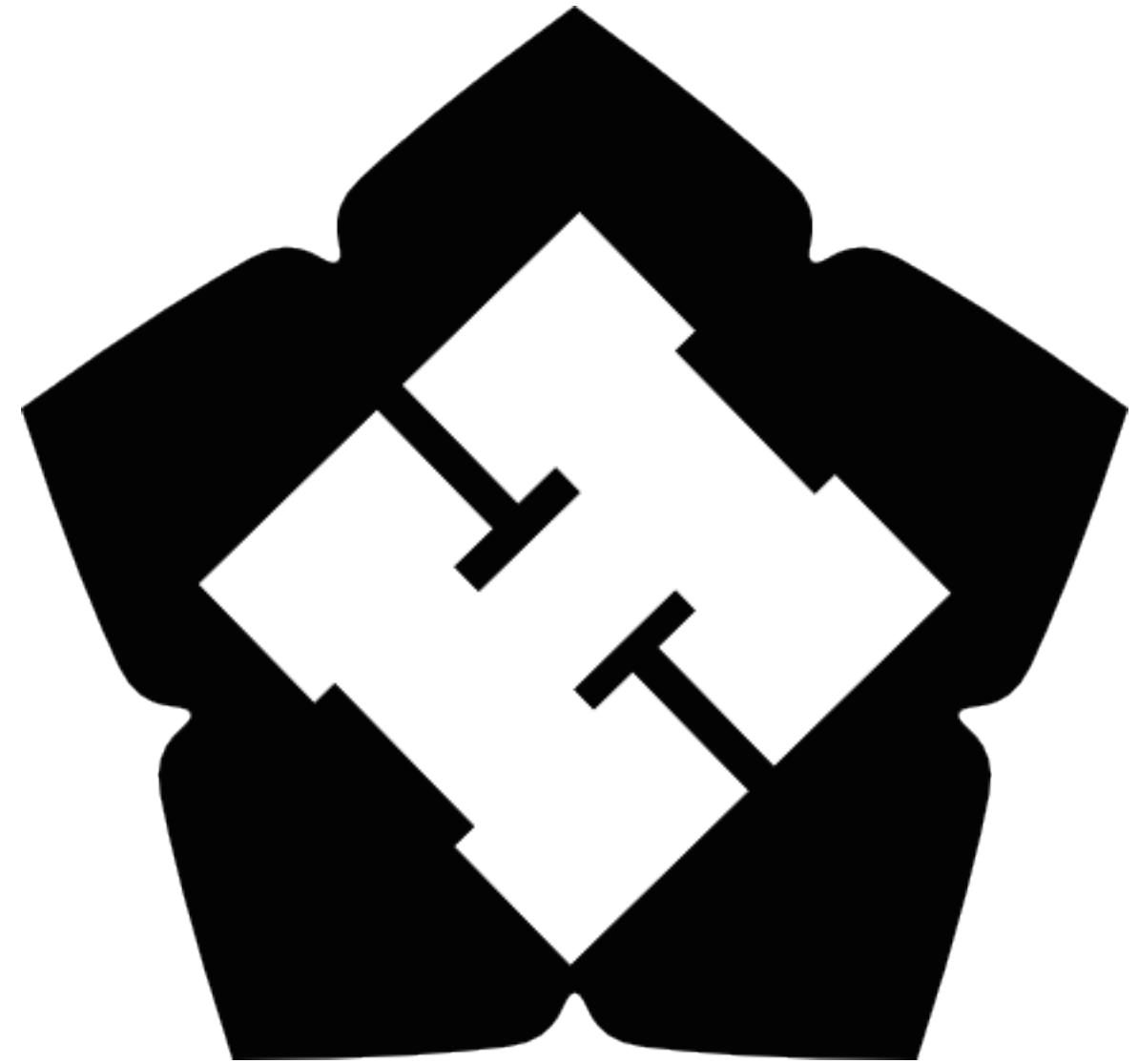
~/Documents/scratch.tidal 4:5

LF UTF-8 TidalCycles GitHub Git (0) 2 updates

Collaboration with l'ull cec and Phonos in *virtual* Barcelona

Follow-up workshop: 4 special teasers in preparation (to be announced soon!)

Follow-up concert with TOPLAP Barcelona (TBD)



Collaboration with Leicester Hackspace and MTI² in *virtual* Leicester
Follow-up workshop?

Materials / Working Tools

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

Schedule

- - **Introductions (all) via chat** - 10'
- - **Introduction to the Leicester Hackspace (Richard)** - 10'
- - **Introduction to the project / team / workshop / software (Anna)** - 10'
- - **Tutorial Freesound quark (Sam)** 10'
- - **Tutorial MIRLC 2.0 (Sam)** 20'
- - **Comfort break** - 10'
- - **Creative exploration of the MIRLC2.0 tool (breakout rooms)** - 30'
- - **Plenary & Closing (all)** - 20'

Learning Outcomes

- Get a sense of the practice of live coding (music live performance using code) by manipulating online crowdsourced sounds and the automatic use of feature descriptors obtained from freesound.org.
- Get insight on a participatory design approach to designing a prototype for live coding performance.
- Get familiar with the application of neural networks, in particular a multilayer perceptron used as a classifier, to improve the practice of live coding with crowdsourced sounds.
- Be exposed to the main steps to solve a problem using machine learning techniques: the creation of a dataset, training a model, testing the model, and performing with / evaluating the model in an iterative cycle.
- Understand how to combine different technologies in SuperCollider to build a prototype for live coding performance.

At the end of the workshop you will be able to...

- Use SuperCollider and the MIRLC2 library to retrieve sounds from Freesound.org based on a live coding approach.
- Use a trained model using the FluCoMa library to retrieve sounds that are based on personal musical taste.
- Train your own model using the FluCoMa library to retrieve sounds that are based on your personal musical taste.
- Analyse how to define a virtual agent that can react to the live coder inputs using the FluCoMa library.
- Explore creative strategies to perform with a virtual agent using machine learning for live coding.

An introduction to MIRLC: an easy live coding language to query sounds from Freesound.org



mirica

Messages 0

Settings Log Out

Upload Sounds

search sounds

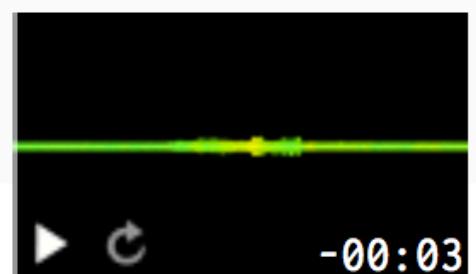
Home

Sounds

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People

Help

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 SoundscapeApril 29th, 2020 [ilaria](#)

[Guest Blog post by Ilaria 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<https://freesound.org>

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!



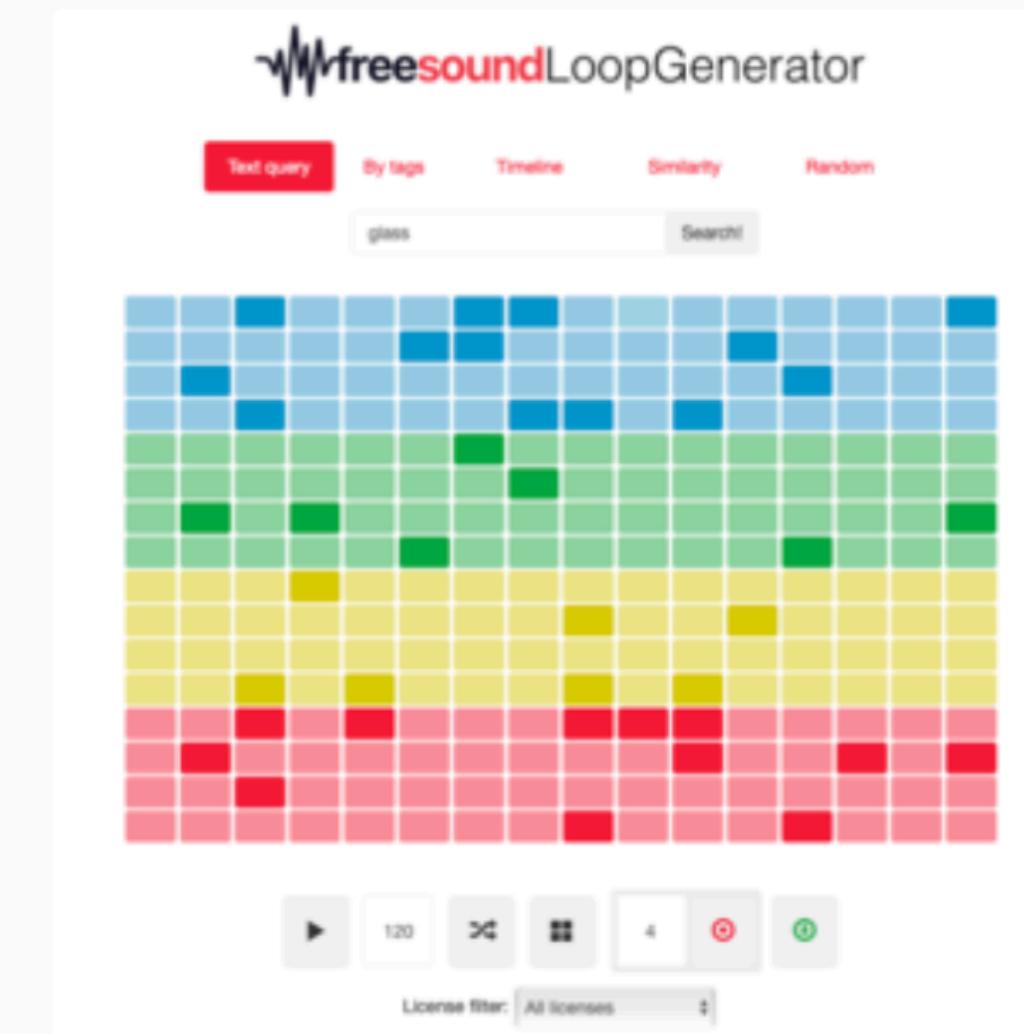
page 1 of 10 >>

[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://labs.freesound.org)
[**https://freesound.org/docs/api/**](https://freesound.org/docs/api/)

[g-roma / Freesound.sc](https://github.com/g-roma/Freesound.sc)

Code Issues Pull requests 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

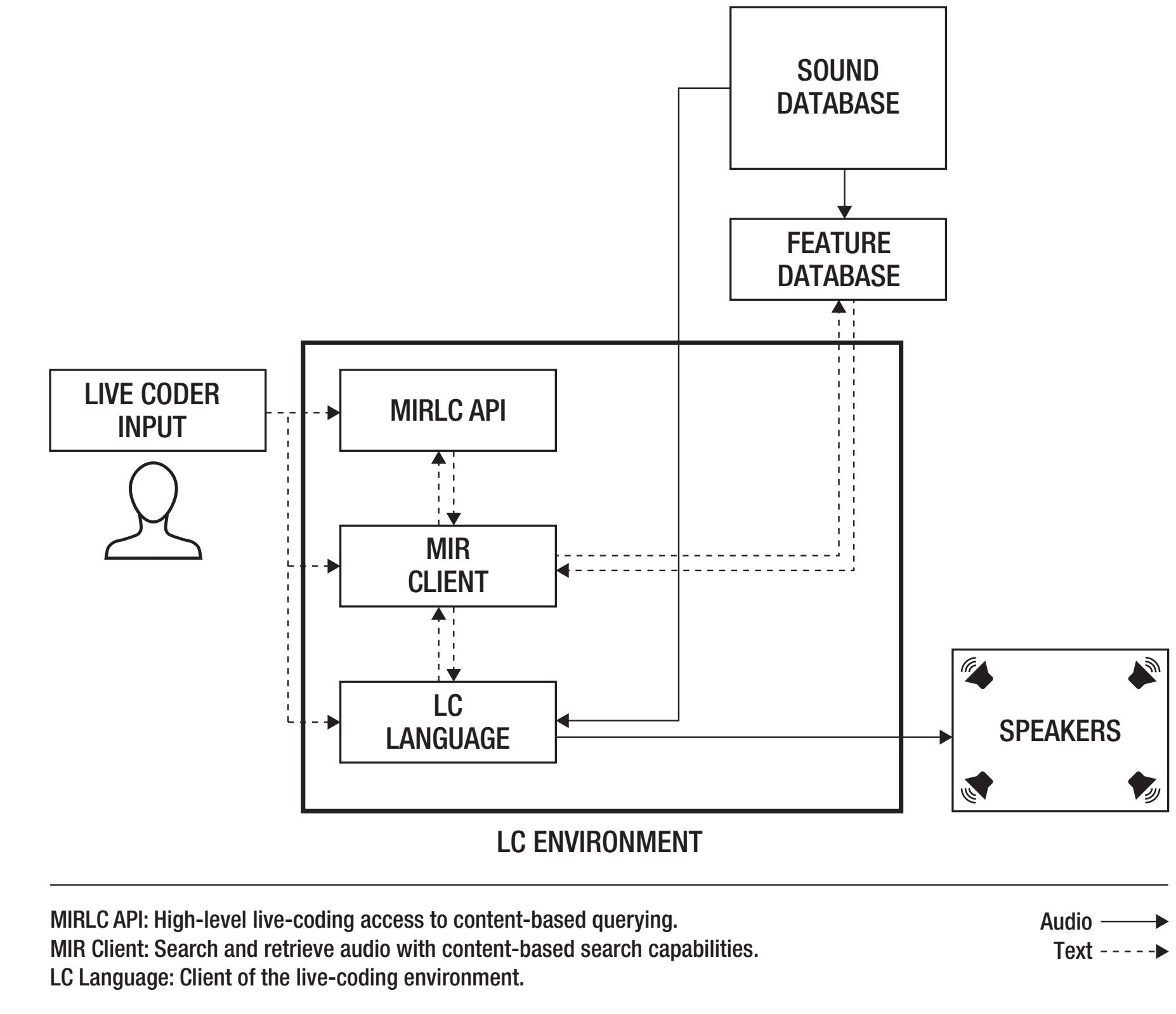
Packages
No packages published

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., Fakelas, 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)
```

```

// 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: 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

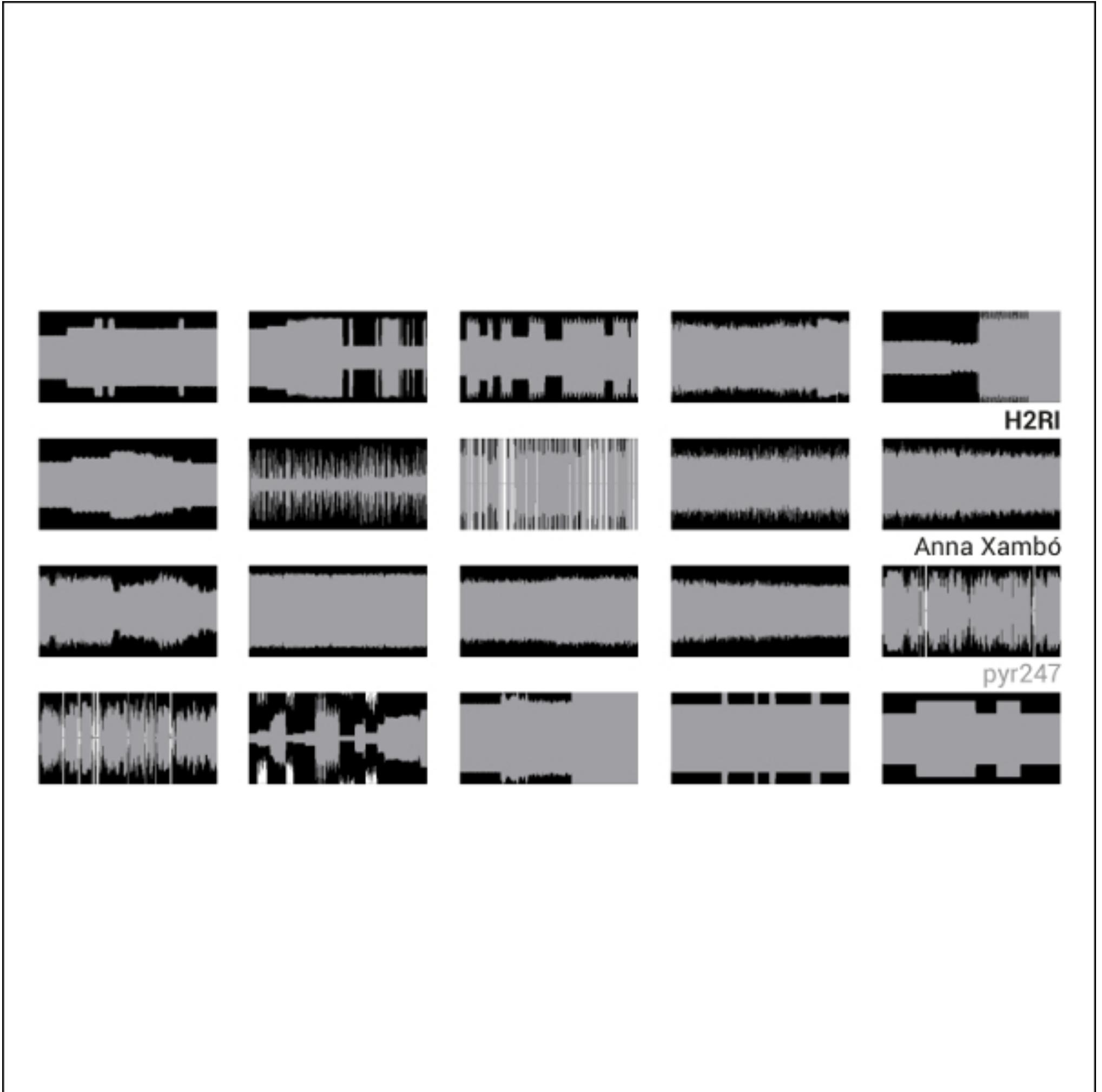
Sound samples used:

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
```

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
-> a MIRLCRep2
Booting 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.freesound.org/api/sounds/?tag=morse&count=7'
-> a MIRLCRep2
{"count":7,"next":null,"results":[{"id":47487,"name":"sw-13.wav","tags":["electronic","morse","noise"]}]
found sound by tag, id: 47487 name: sw-13.wav
curl -H 'Authorization: Token 5a837b803eb5a6da25dd3b42346fd6550080b919' 'https://www.freesound.org/api/sounds/47487'
{"id":47487,"url":"https://freesound.org/people/galeku/sounds/47487/","name":"sw-13.wav","tags":[]}
curl -H 'Authorization: Token 5a837b803eb5a6da25dd3b42346fd6550080b919' 'https://freesound.org/api/sounds/47487'
[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.

MIRLCRep 2.0

**Next:
Live Tutorials by Sam Roig**

Creative exploration of the MIRLC2.0 tool (breakout rooms)

Break-out Group Discussion Brief

- 1. What are the challenges and opportunities of sound-based music:**
 1. for composing
 2. for performing
 3. for live coding
- 2. How do you envision using the tool of MIRLC in your own practice?**
- 3. Can you provide a live-coding example?**