

WebAudio

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Technologies web - *introduction*

Internet

Ensemble de protocoles de transfert de données (TCP, IP, ...) pour l'interconnection de réseaux

1972 - Première démonstration officielle d'*ARPANET*
envoi d'un message entre UCLA et Stanford

1983 - *ARPANET* est officiellement renommé *Internet*

World Wide Web

Système de partage d'informations hypertexte fonctionnant sur Internet

1989-1992 - Développement au CERN par T. Berners Lee et *Robert Caillau (logiciels et protocoles)*

1993 - Le CERN ouvre les technologies au domaine public

Basics

HTTP

HyperText Transfert Protocol

URL

Uniform Resource Locator

HTML

HyperText Markup Language



Languages

html / css / javascript

```
let counter = 0;

(function hide() {
    $list.forEach(($el, index) => {
        $el.classList.remove('hide');

        if (index === counter)
            $el.classList.add('hide');
    });
}

counter = (counter += 1) % $list.length;
timeoutId = setTimeout(hide, 1000);
}());
```

<http://127.0.0.1:3000>

web as creative platform

ubiquity

almost every device implements web standards

interactive multimedia

HTML5/CSS, Web GL, Canvas, Web Audio API,
DeviceMotion/Orientation, Geolocation

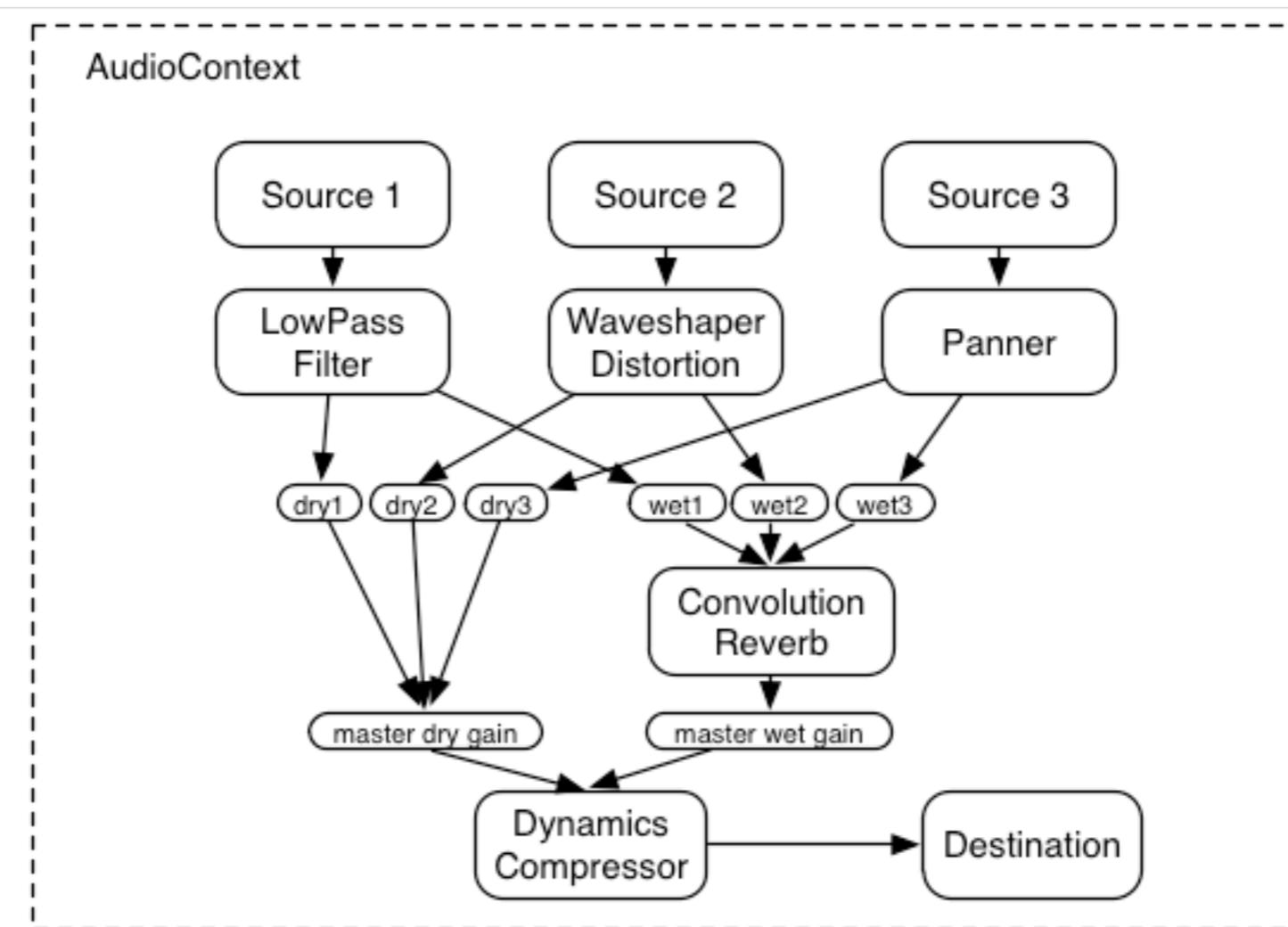
networking

HTTP, WebSockets, WebRTC

rapid prototyping & interoperability (using Node.js)

very rapid development / deployment cycles

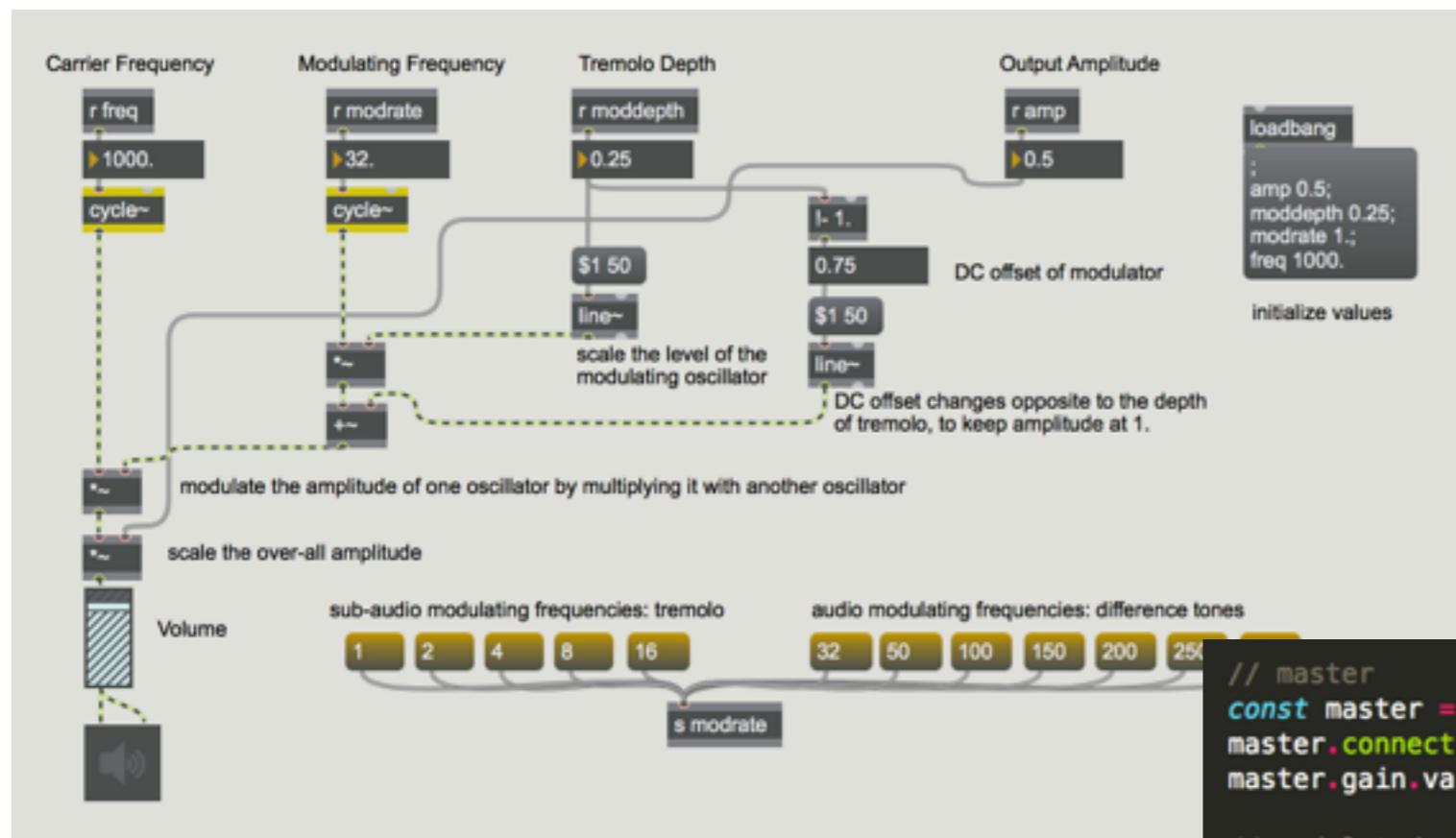
WebAudio



specification

<https://webaudio.github.io/web-audio-api/>

WebAudio



```
// master
const master = audioContext.createGain();
master.connect(audioContext.destination);
master.gain.value = 0; // default to muted

// modulated amplitude
const amplitude = audioContext.createGain();
amplitude.connect(master);
amplitude.gain.value = 1 - defaultDepth;
amplitude.gain.setValueAtTime(1 - defaultDepth, audioContext.currentTime);

// carrier
const carrier = audioContext.createOscillator();
carrier.connect(amplitude);
carrier.frequency.value = 1000;

// modulation
const depth = audioContext.createGain();
depth.connect(amplitude.gain);
depth.gain.value = defaultDepth
depth.gain.setValueAtTime(defaultDepth, audioContext.currentTime);

const mod = audioContext.createOscillator();
mod.frequency.value = 1;
mod.connect(depth);

carrier.start(audioContext.currentTime);
mod.start(audioContext.currentTime);
```

TP 1 - AM Synthesis

./tp1-am

Waves

WebAudio Visualisation Edition and Synthesis

<https://github.com/wavesjs/>

waves-ui

<http://wavesjs.github.io/waves-ui/examples/layer-waveform.html>

<http://wavesjs.github.io/waves-ui/examples/layer-axis.html>

<http://wavesjs.github.io/waves-ui/examples/layer-segment.html>

<http://wavesjs.github.io/waves-ui/examples/states-zoom.html>

waves-audio

<https://rawgit.com/wavesjs/waves-audio/master/examples/player-engine.html>

<https://rawgit.com/wavesjs/waves-audio/master/examples/granular-engine.html>

waves-lfo

<https://cdn.rawgit.com/wavesjs/waves-lfo/master/examples/sink-vu-meter-display/index.html>

<https://cdn.rawgit.com/wavesjs/waves-lfo/master/examples/sink-waveform-display/index.html>

<https://cdn.rawgit.com/wavesjs/waves-lfo/master/examples/operator-segmenter/index.html>

<https://cdn.rawgit.com/wavesjs/waves-lfo/master/examples/mosaicking/index.html>

waves-lfo

<https://wave.ircam.fr/demo/phoenix-1901/>

<https://wave.ircam.fr/demo/bachothéque/>

<https://wave.ircam.fr/demo/leroux-voirex/>

CoSiMa

=

{ people

+ smartphones

+ web standards }

×

{ anywhere + anytime }

mobile devices

ubiquity

almost everybody has a smartphone
and takes it almost everywhere

multimodal sensing

multi-touch, 9-axis motion sensors,
microphone, camera, ...

audiovisual rendering

real-time audio and graphics processing capabilities, a
screen, and decent audio i/o

Projects

Collective Sound Checks

Since 2014



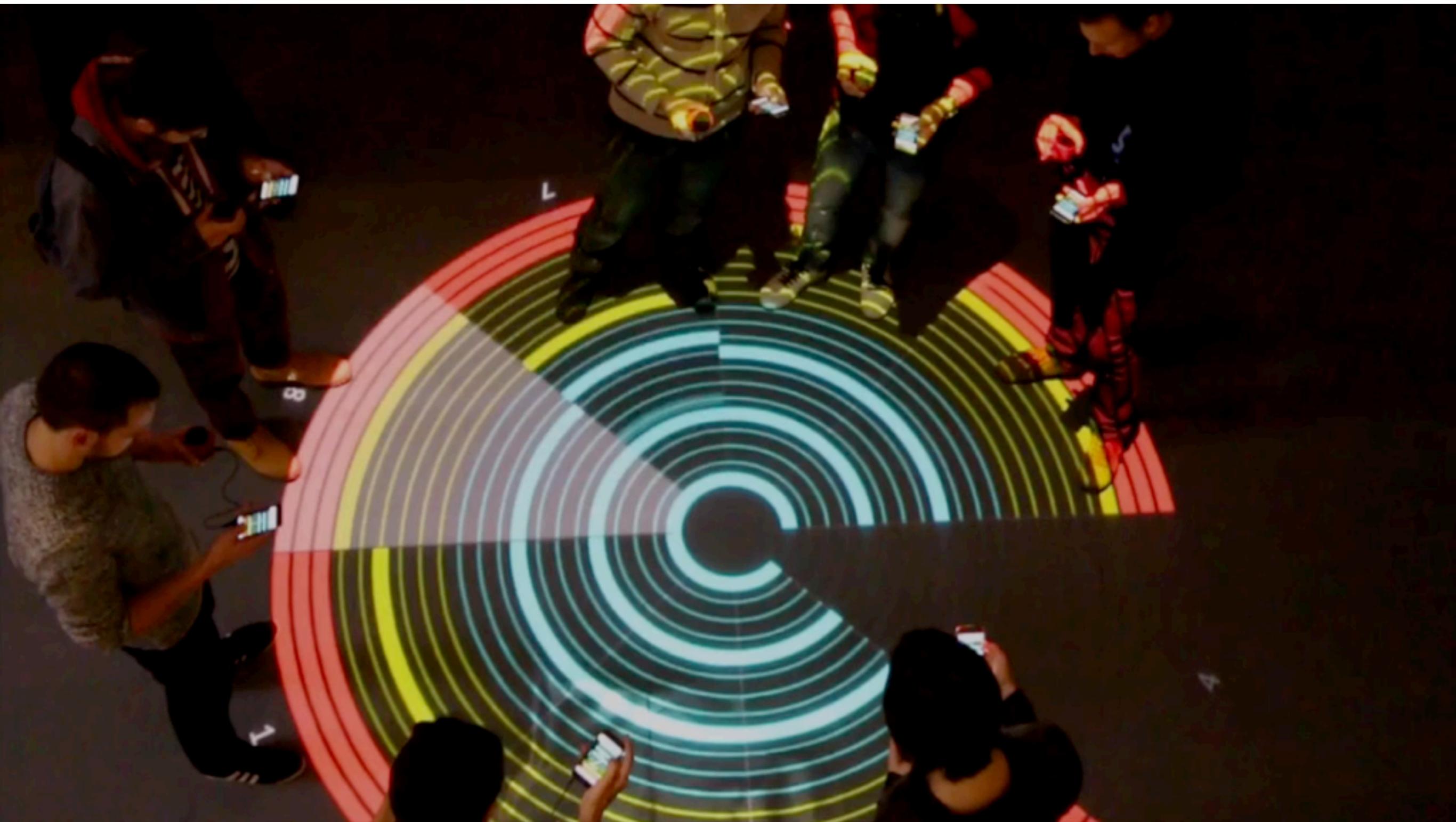
Chloé × Ircam

Fête de la Musique, 2015 / Nuit Blanche, 2015



Collective Loops

Forum Workshops Ircam, 2015 / Yokohama, 2017



88 Fingers

N. Schnell, B. Matuszewski, 2016



Your Smartest Choice

Huihui Cheng, Eclat Festival - Stuttgart, 2017

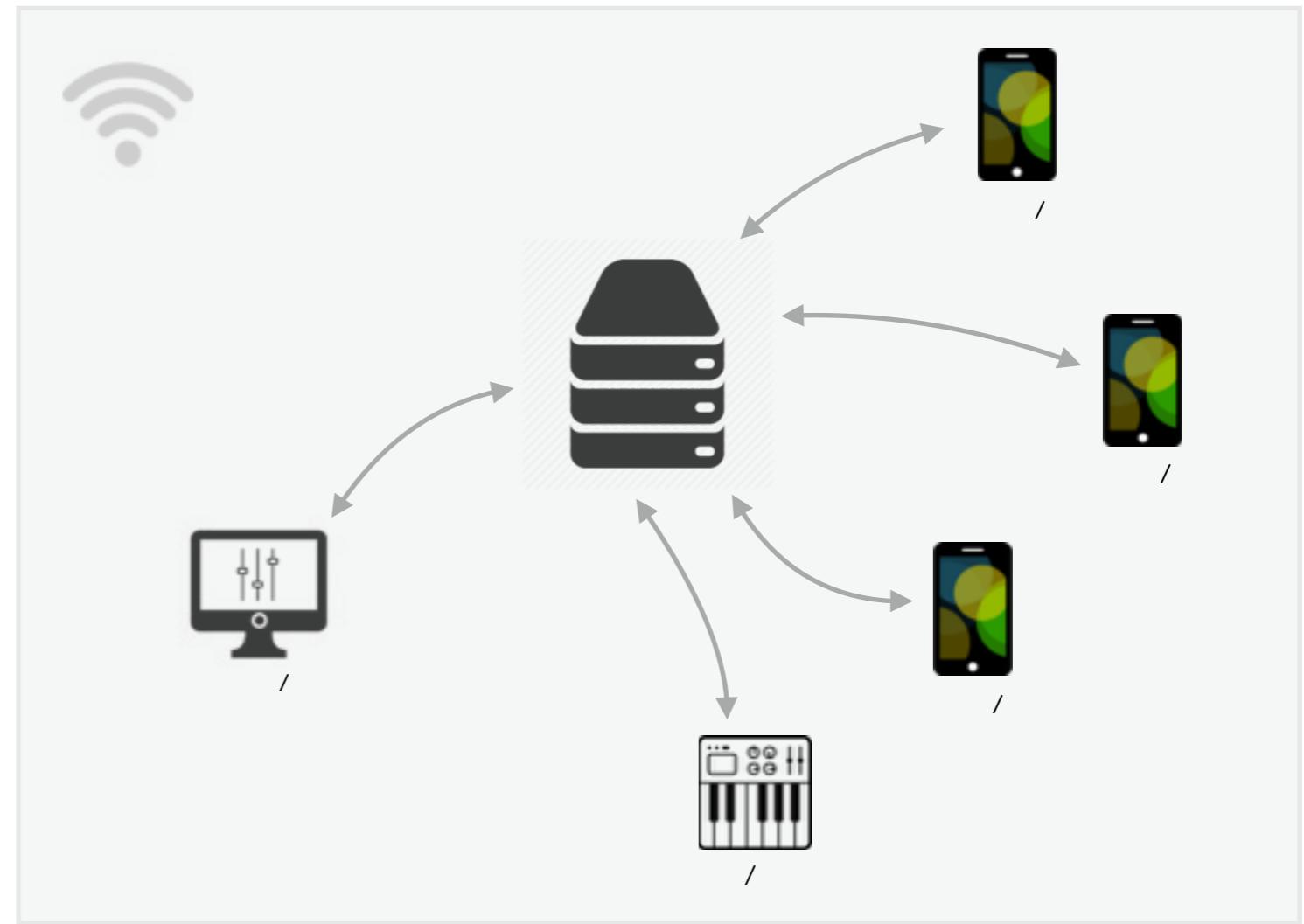


GrainField

Audio Mostly, London, 2018



Soundworks



framework

<https://github.com/collective-soundworks/soundworks>

application boilerplate

<https://github.com/collective-soundworks/soundworks-template>

Soundworks

*Framework dedicated to the rapid prototyping of synchronised
and distributed multimedia applications*

...mainly a set of services

- clock synchronisation
- messaging
- distributed state
- groups of clients
- ...

Examples

WiFi: **CoSiMa**

URL: **http://co.si.ma**

piano phase

<http://co.si.ma:8000>

<https://github.com/ircam-cosima/piano-phase>

elements

<http://co.si.ma:8001>

TP 2 - Echo

`./tp2-boilerplate`

`./tp2-final`

Questions ?