Module 13

Wrap-up

Module 01

Processing Recap

- Types
- Variables
- Control flow
- Functions
- Classes

Module 02

Arrays and Strings

- Array operations
- Arrays as values
- Functions on arrays
- Special characters
- Concatenating strings
- String equality
- Outputting text

Module 03

Input/Output

- Reading and writing images
- Reading and writing illustrations
- Reading and writing text
- `splitTokens()`

Module 04

Advanced Shapes

- `beginShape()` / `vertex()` / `endShape()`
- Using `PVector` to represent points
- Angles
- Polar coordinates

Module 05

User Interfaces

- Model-View-Controller paradigm
- Direct Manipulation
- Hit testing
- UI Toolkits
- ControlP5

Module 06

Geometric Context

- `translate()`, `rotate()`, `scale()`
- `pushMatrix()`, `popMatrix()`
- **Order of operations**
- **Building up complex transformations**
- **Hierarchical modelling**

Module 07

Recursion

- Recursion in recursivedrawing.com
- Anatomy of recursion (base case / recursive case / making progress)
- Writing simple recursive functions

Module 08

Randomness

- The `random()` function
- Generating random integers
- Flipping a coin
- Bias
- Pseudorandomness
- Using `randomSeed()`

Module 09

Noise

- **Using the** `noise()` **function**
- **How** `noise()` **works in 1D, 2D and 3D**
- **How** `noise()` **is different from** `random()`

Module 10

Data Processing and Text

- Shapes of data: text, sequence, dictionary, table, tree, graph
- Working with text in external files
- Using `join()`, `trim()`
- Working with Dictionaries
- Regular expressions—what are they?

Module 11

Tables

- Rows and columns (records and fields)
- CSV files
- Loading tables
- Reading data out of tables
- Sorting by column values

Module 12

Tree-Structured Data

- JSON files
- Types in JSON
- Loading JSON files
- Reading values out of JSON objects

Not appearing

- 3D
- Physics and Animation
- Sound
- Video, live camera input
- Idioms, software engineering
- Testing and debugging

The final exam

- Saturday, April 8th
  12:30pm–3:00pm
  PAC 11, 12
- Similar in style to the midterm
- Memorization is not the key

Review sessions

- Today, 4:00-5:20, QNC 2502
- Thursday, 2:00-4:00, MC 4020
- Study questions posted to LEARN

Office hours

- My hours: Friday afternoon
- ISA hours: the usual

Study aids

- **The midterm**
- Assignment and lab questions
- 2015/2016 assignment and lab questions
- Practice programming exercises
- Clicker questions
- Final exam review
- Midterm review, last year's reviews
- Your imagination

Practice on paper, not just in Processing

Marking scheme reminder

- Assignment mark based on best 9 of 10 assignments
- Participation mark based on best 75% of clicker responses
- Must pass exam portion of course

Issues with Processing

- Geared more towards artistic practice than teaching
- Java is becoming a bit problematic
- But still a fun, practical tool, and useful for designers

Untitled – DrRacket

Untitled (define ...) Check Syntax Debug Macro Stepper #' Run Stop

```
#lang racket

;; square : number -> number
;; to produce the square of x
(define (square x)
  (* x x))
```

```
Welcome to DrRacket, version 5.1.2 [3m].
Language: racket; memory limit: 128 MB.
> (square 2)
4
>
```

Determine language from source 4:2

p5.js

Download * Start * Reference * Libraries * Learn * Community

Hello! p5.js is a JavaScript library that starts with the original goal of Processing, to make coding accessible for artists, designers, educators, and beginners, and reinterprets this for today's web.

Using the original metaphor of a software sketchbook, p5.js has a full set of drawing functionality. However, you're not limited to your drawing canvas, you can think of your whole browser page as your sketch! For this, p5.js has addon libraries that make it easy to interact with other HTML5 objects, including text, input, video, webcam, and sound.

p5.js is a new interpretation, not an emulation or port, and it is in active development. An official editing environment is coming soon, as well as

Python Mode for Processing

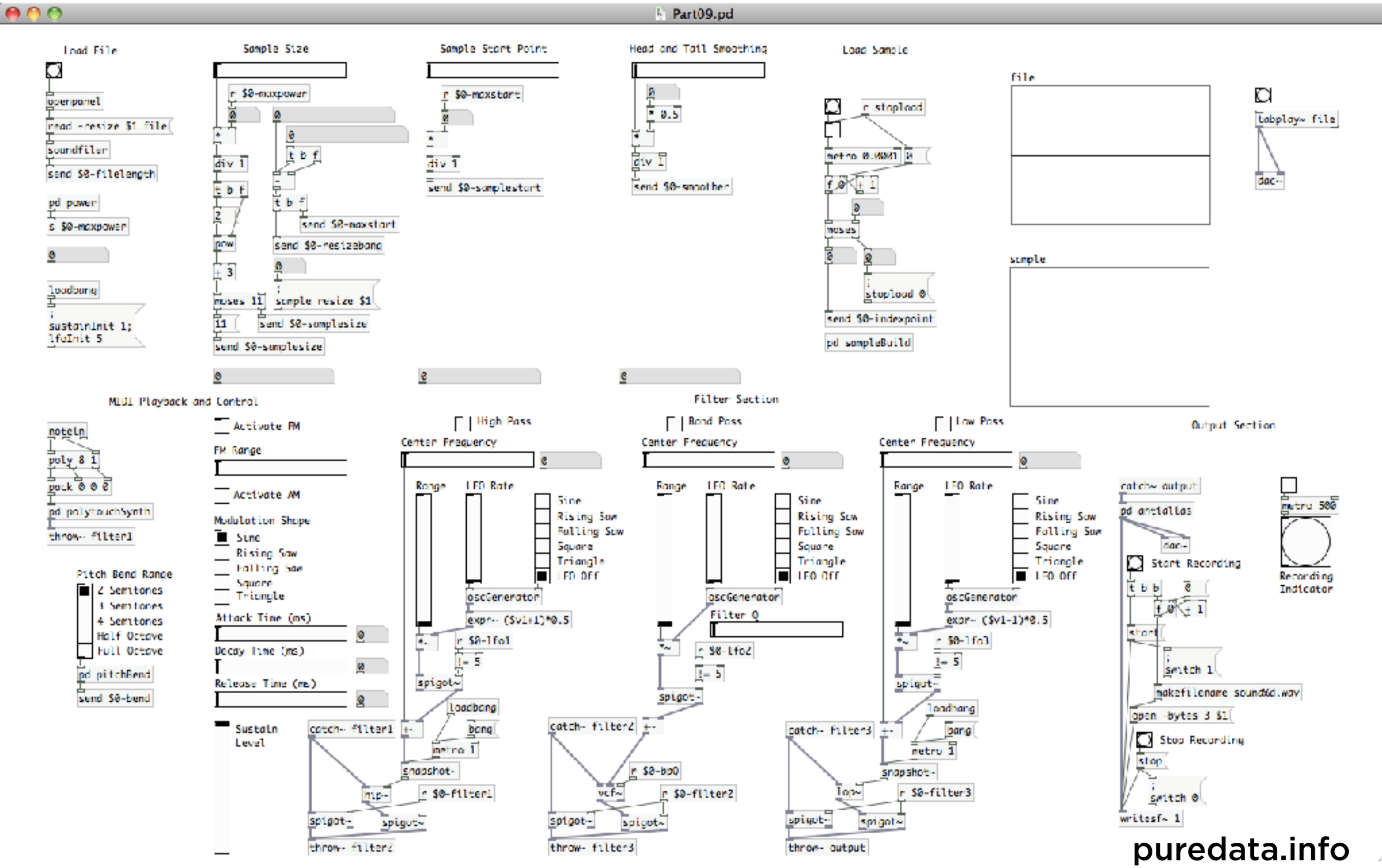
You write Processing code. In Python.

Python Mode for Processing 3 is out! Download it through the contributions manager, and try it out.

Processing is a programming language, development environment, and online community. Since 2001, Pr promoted software literacy within the visual arts and visual literacy within technology. Today, there are t thousands of students, artists, designers, researchers, and hobbyists who use Processing for learning, prot production.

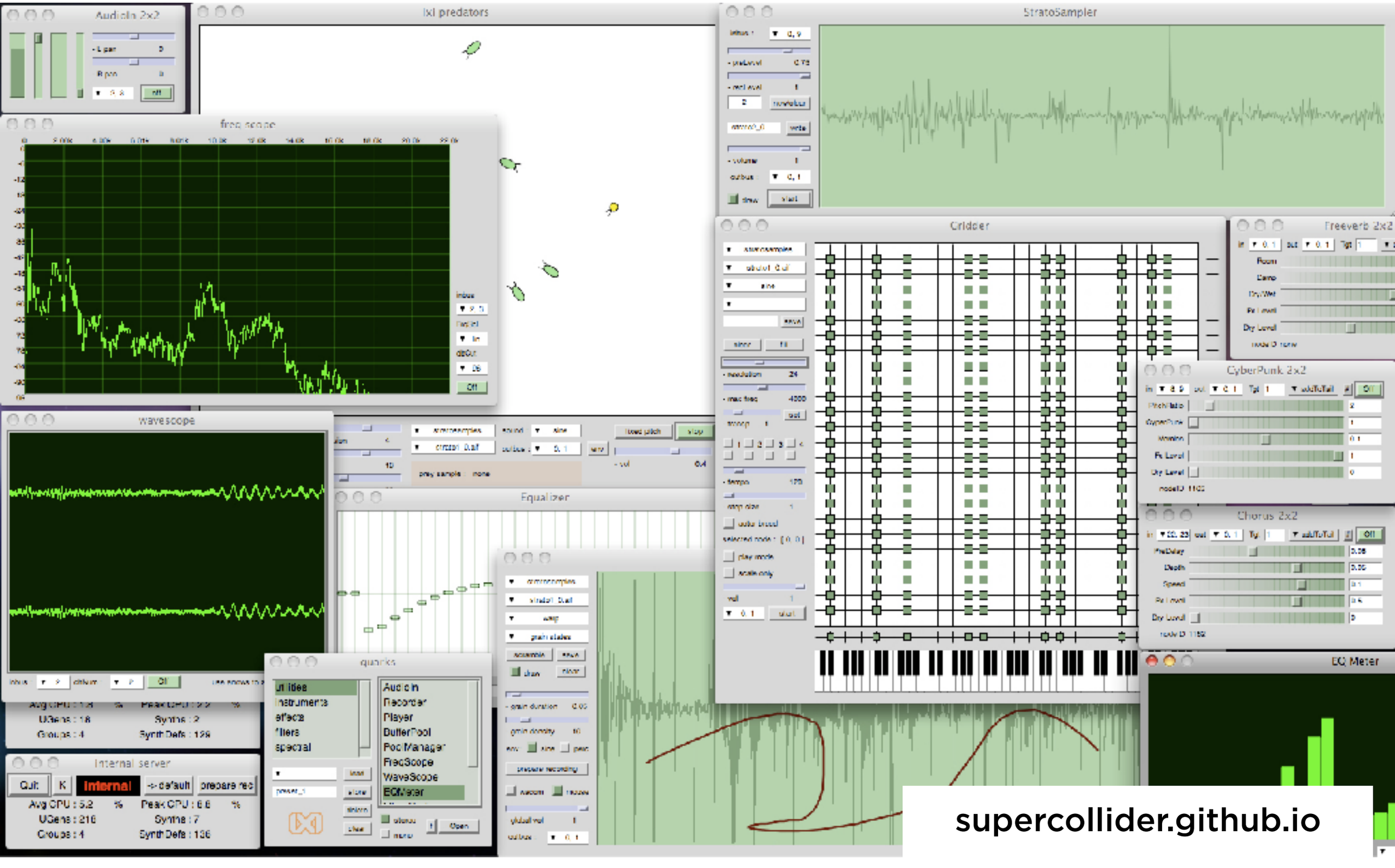
Processing was initially released with a Java-based syntax, and with a lexicon of graphical primitives that inspiration from OpenGL, Postscript, Design by Numbers, and other sources. With the gradual addition of progamming interfaces — including JavaScript, Python, and Ruby — it has become increasingly clear that

Pure Data



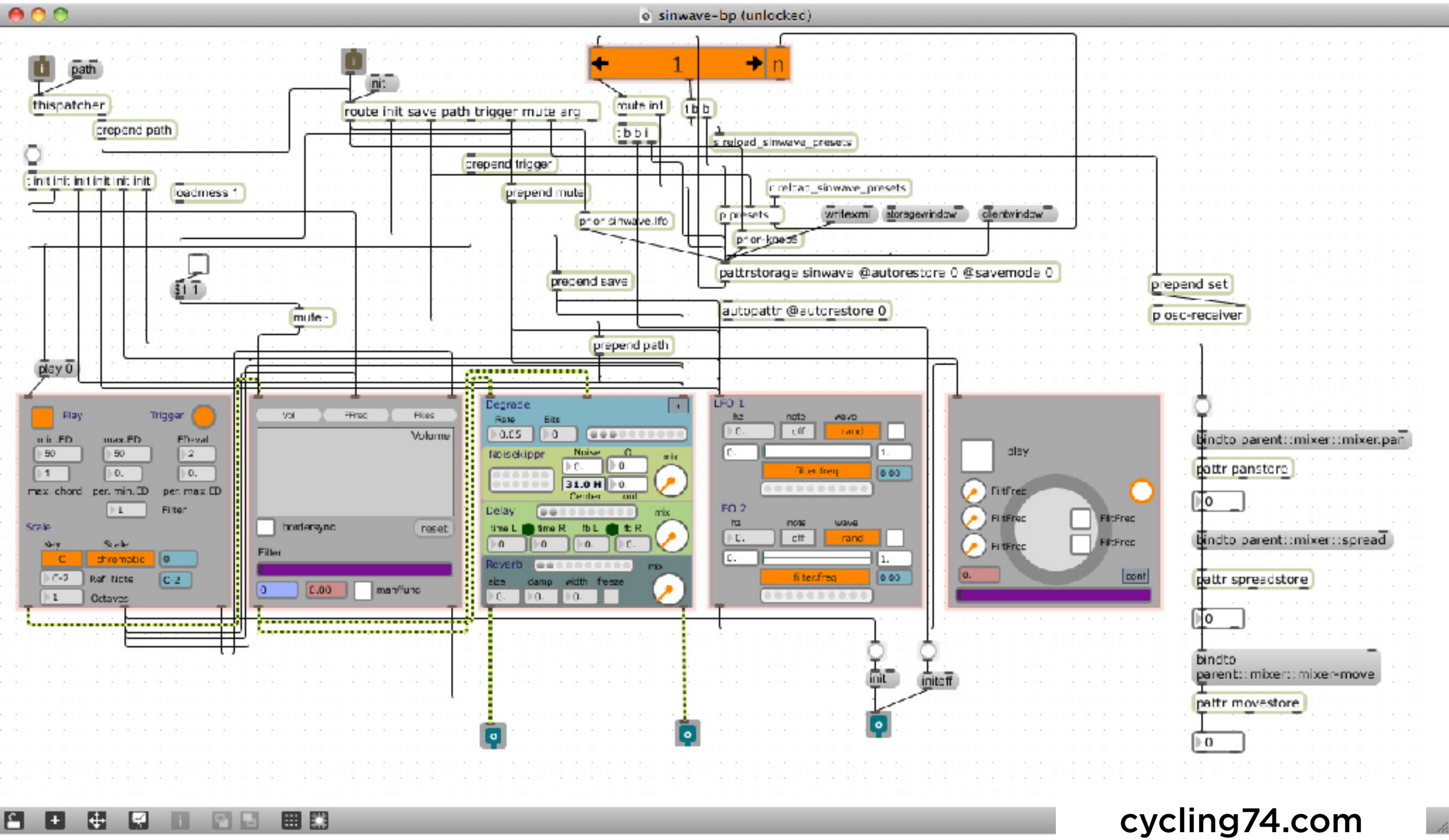
puredata.info

SuperCollider



supercollider.github.io

Max/MSP



cycling74.com

Haxe/OpenFL

Madden NFL Mobile

Mino Monsters 2: Evolution

Papers, Please

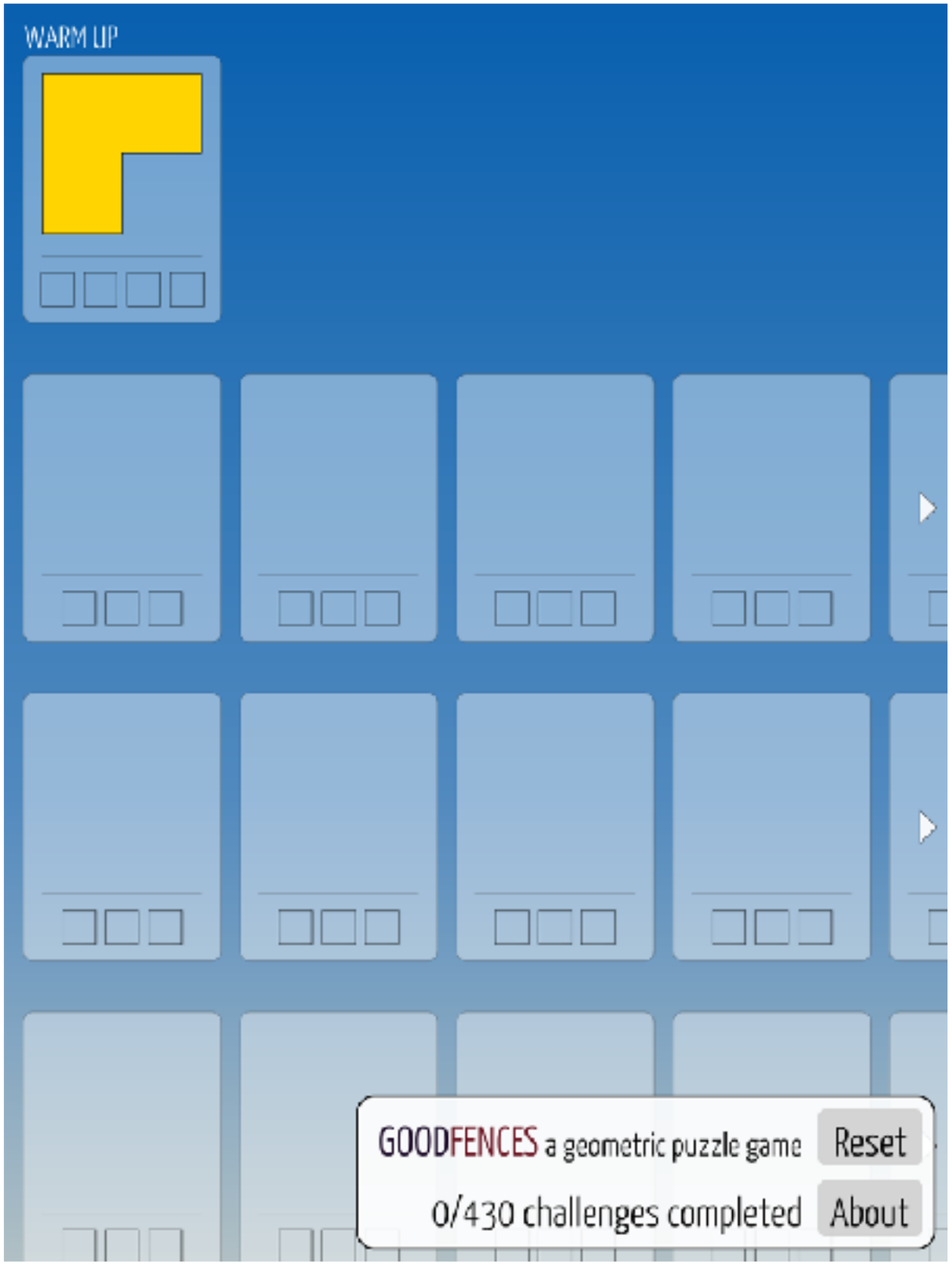
Pocket Kingdom

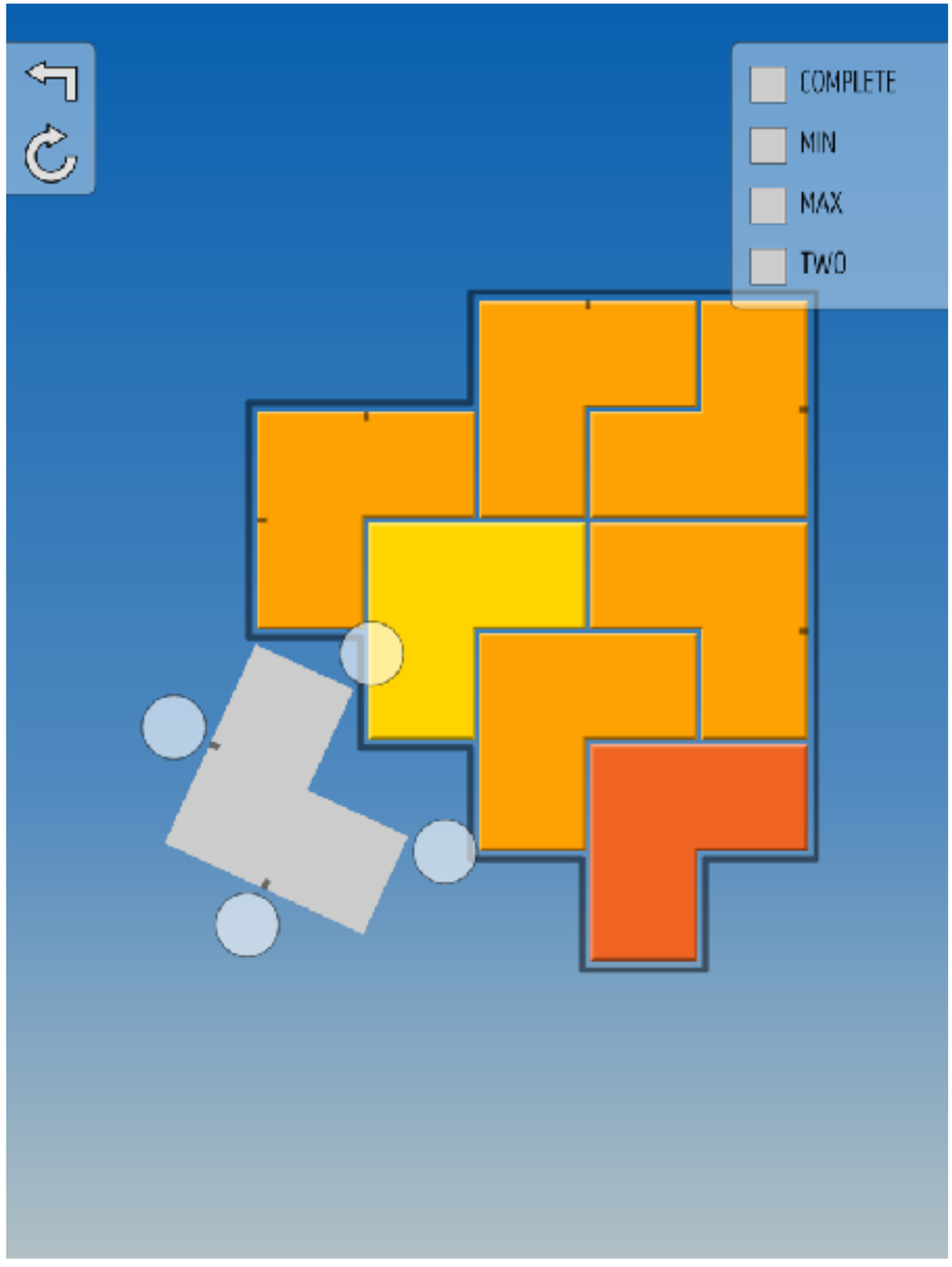
Saban's Mighty Morphin Powe...

Redshift Blueshift

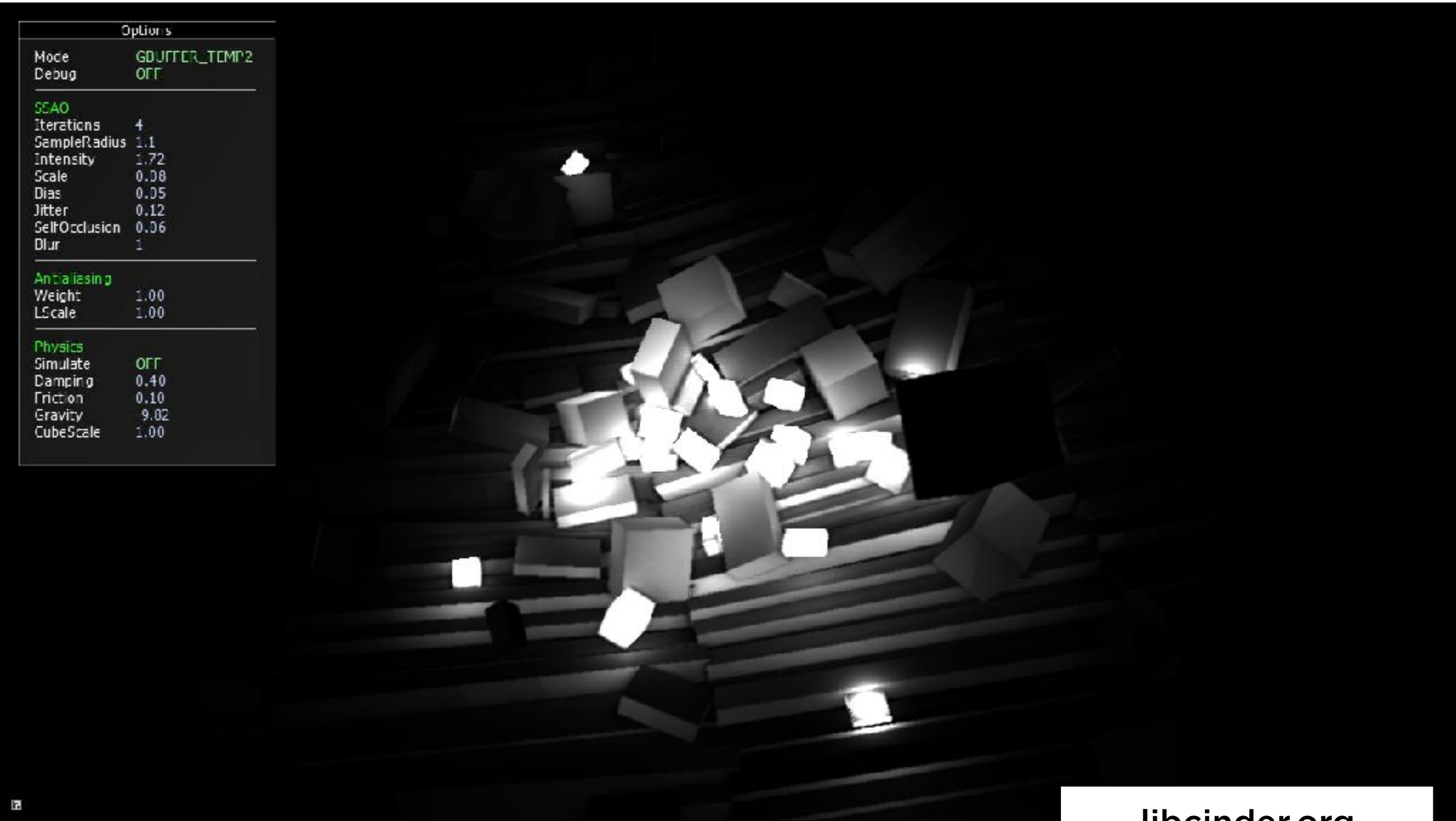
openfl.org

Good Fences (Haxe/OpenFL)

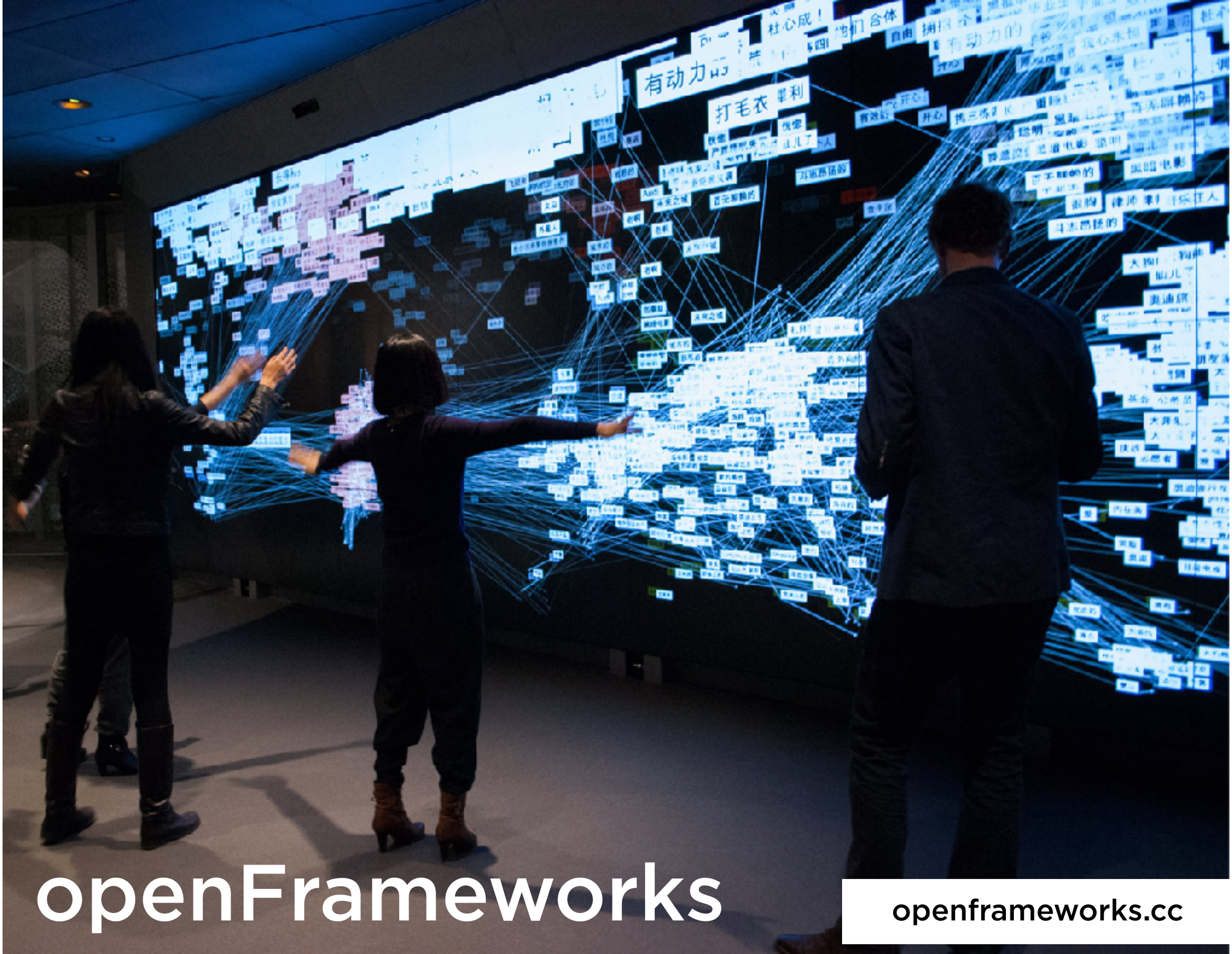




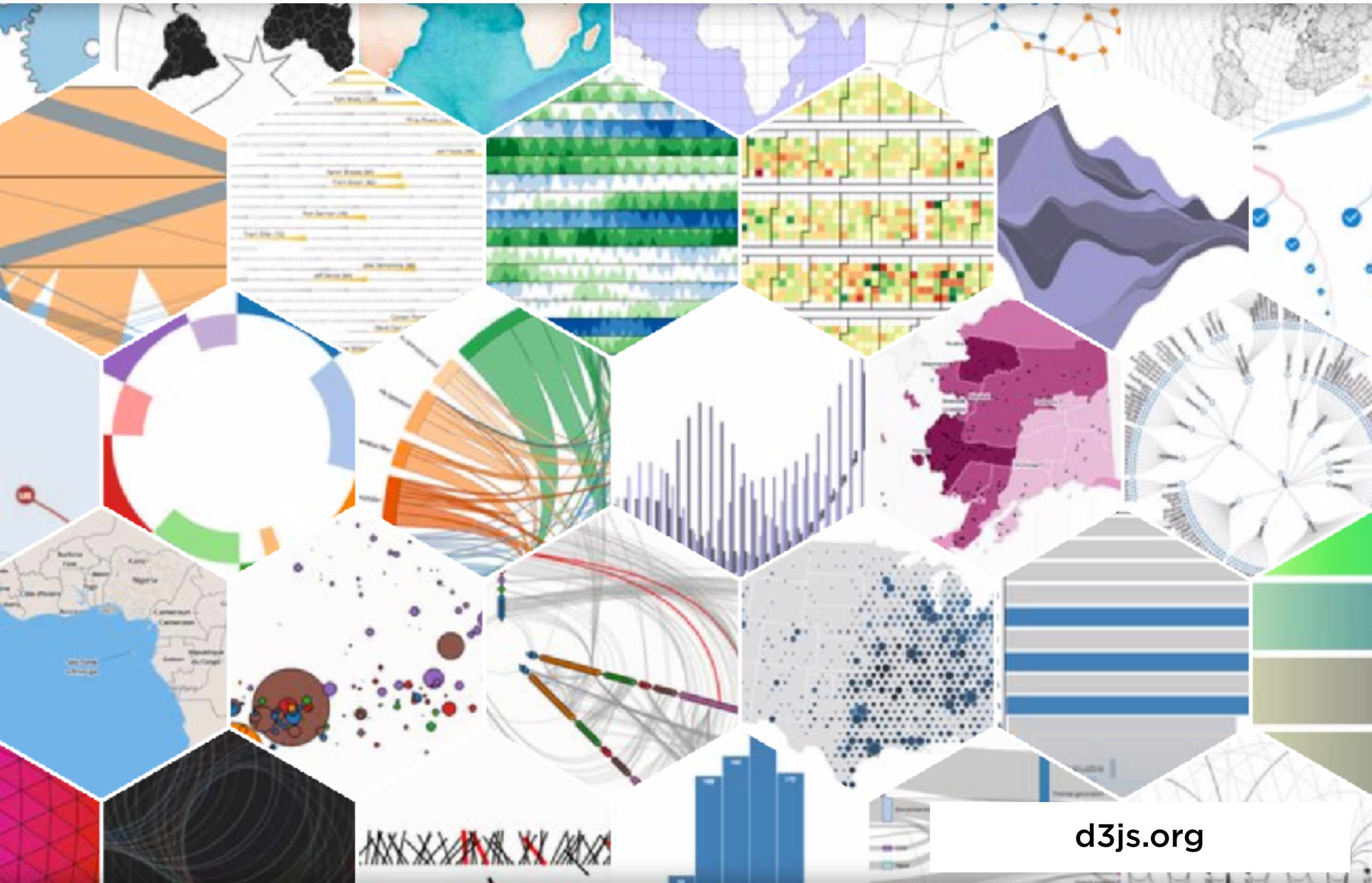
Cinder



libcinder.org


有动力
打毛衣
openFrameworks
openframeworks.cc

D3



d3js.org

Code is a creative medium.