Processing Workshop

Till Nagel, IUAV, 10/2008

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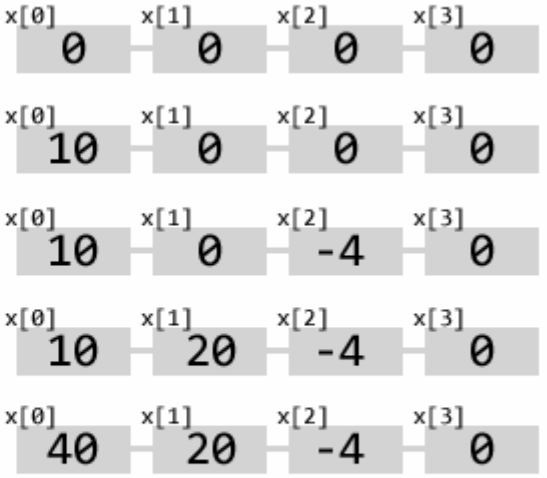
Arrays: Access via an index

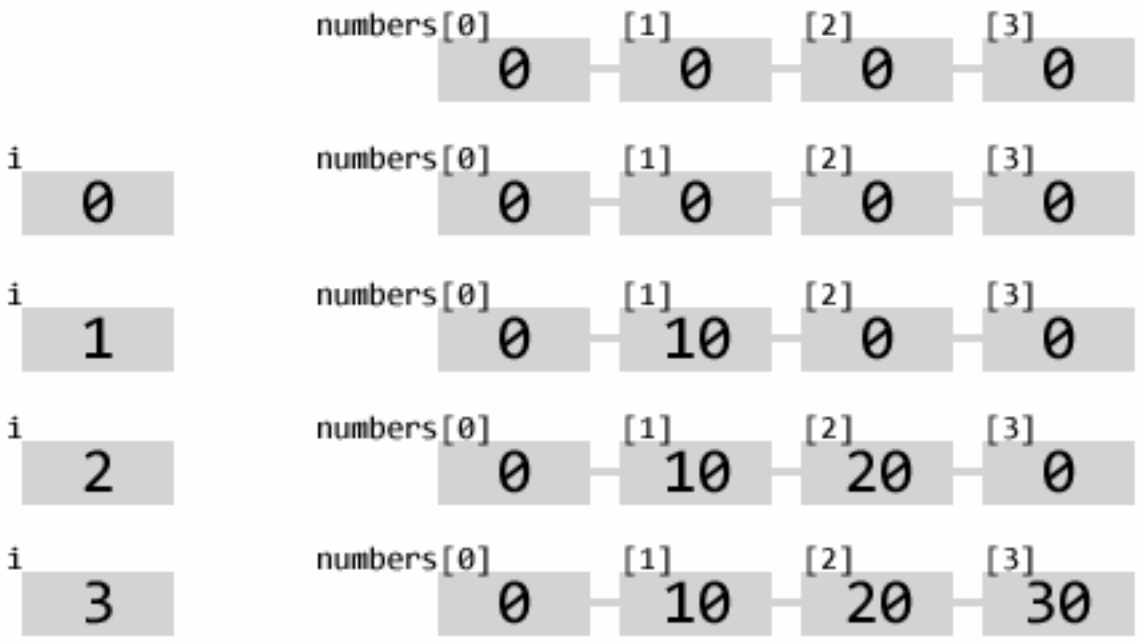
```
int[] x = new int[4];

x[0] = 10;

x[2] = -4;

x[1] = 2 * 10;

x[0] = x[1] * 2;
```



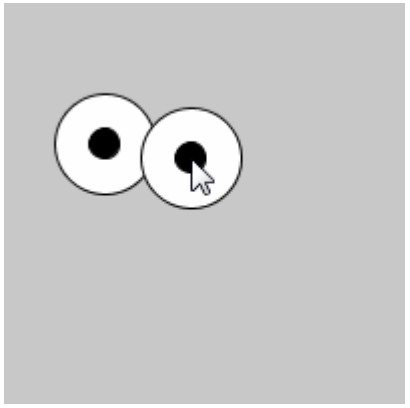
Arrays & Loops

```
int[] numbers = new int[4];
for (int i = 0; i < 4; i = i + 1) {
  numbers[i] = i * 10;
}
```

Arrays & Loops

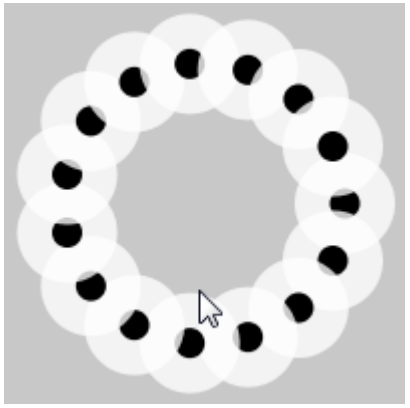


Functions: Reuse code



```
void draw() {
  background(255);
  drawEye(50, 70);
  drawEye(mouseX, mouseY);
}

void drawEye(int x, int y) {
  fill(255);
  ellipse(x, y, 50, 50);
  fill(0);
  ellipse(x, y, 15, 15);
}
```

Functions & Loops



```
void draw() {
  background(200);
  for (int deg = 0; deg < 360; deg += 24) {
    float angle = radians(deg);
    float x = cos(angle) * 70;
    float y = sin(angle) * 70;
    drawEye(x + 100, y + 100);
  }
}
```

Simple state machines in interaction

Libraries: Extending Processing

Libraries

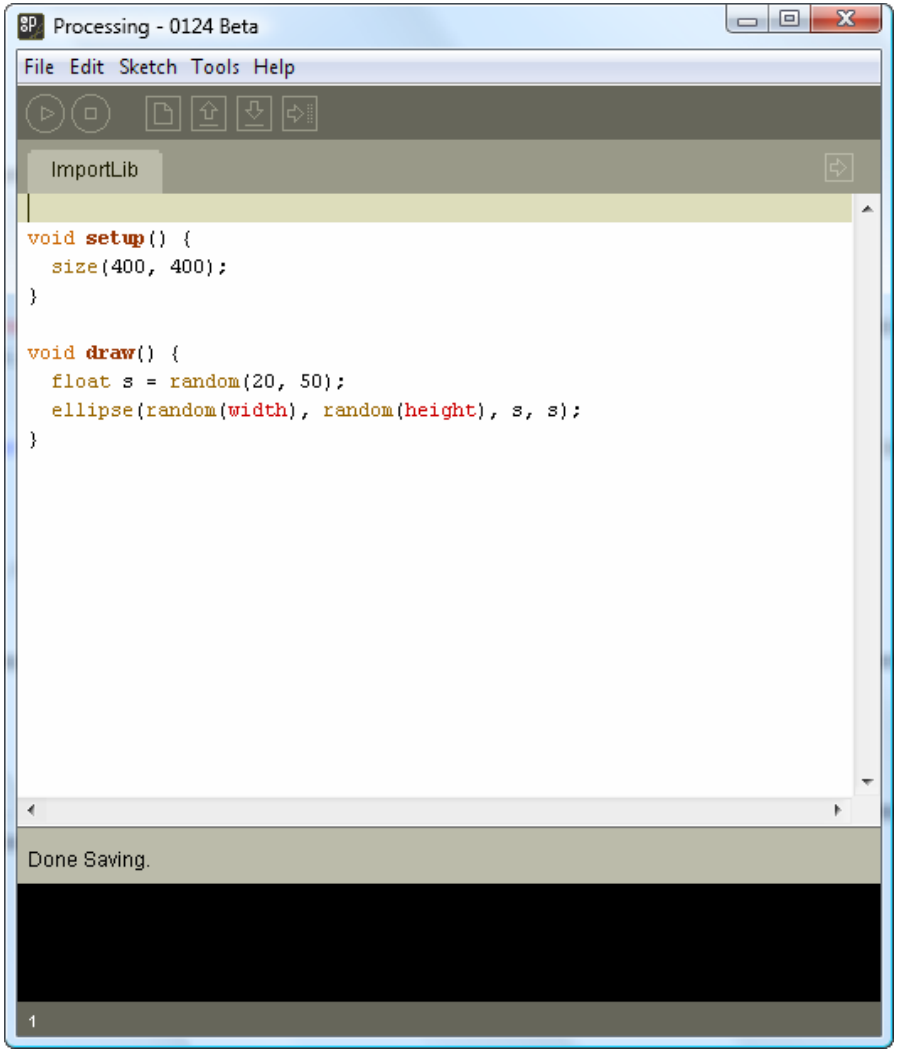
Processing has a narrow focus

Processing can be extended

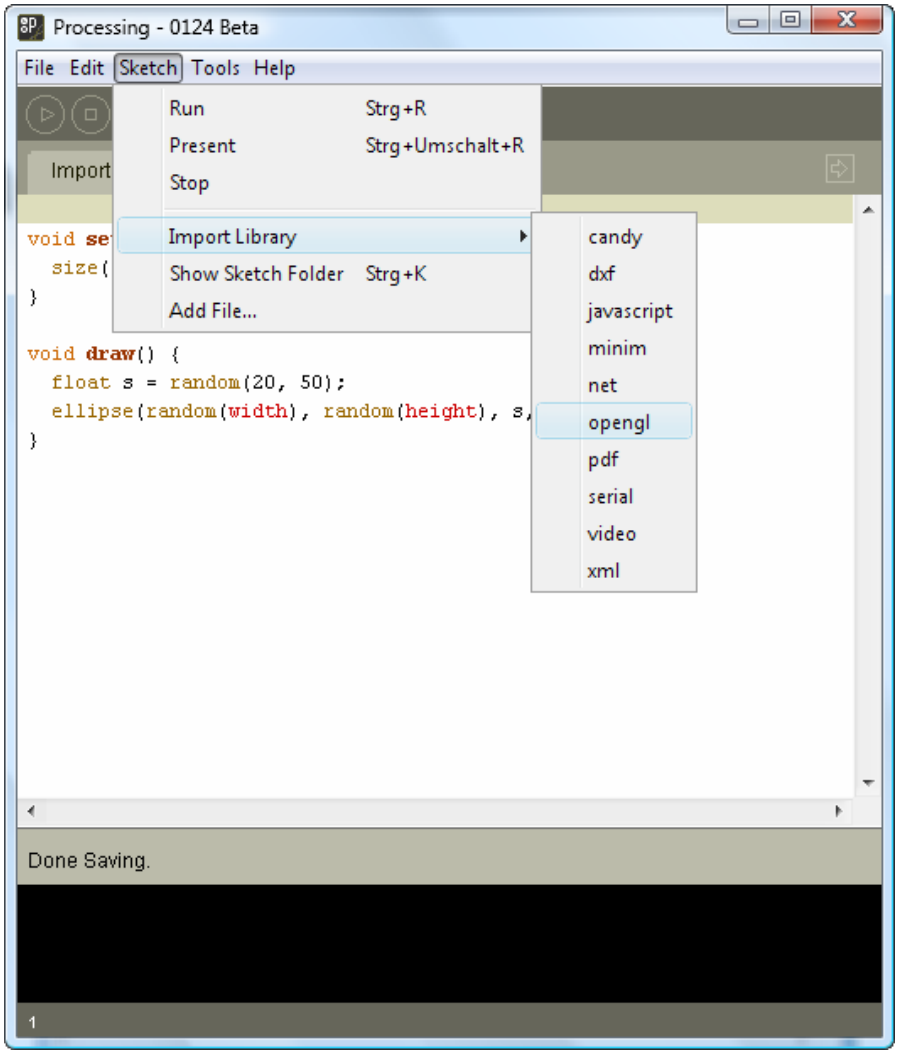
Internal and external functionality

Libraries are collections of specific functionality

Libraries


Processing - 0124 Beta
File Edit Sketch Tools Help
ImportLib
void setup() {
size(400, 400);
}
void draw() {
float s = random(20, 50);
ellipse(random(width), random(height), s, s);
}
Done Saving.
1

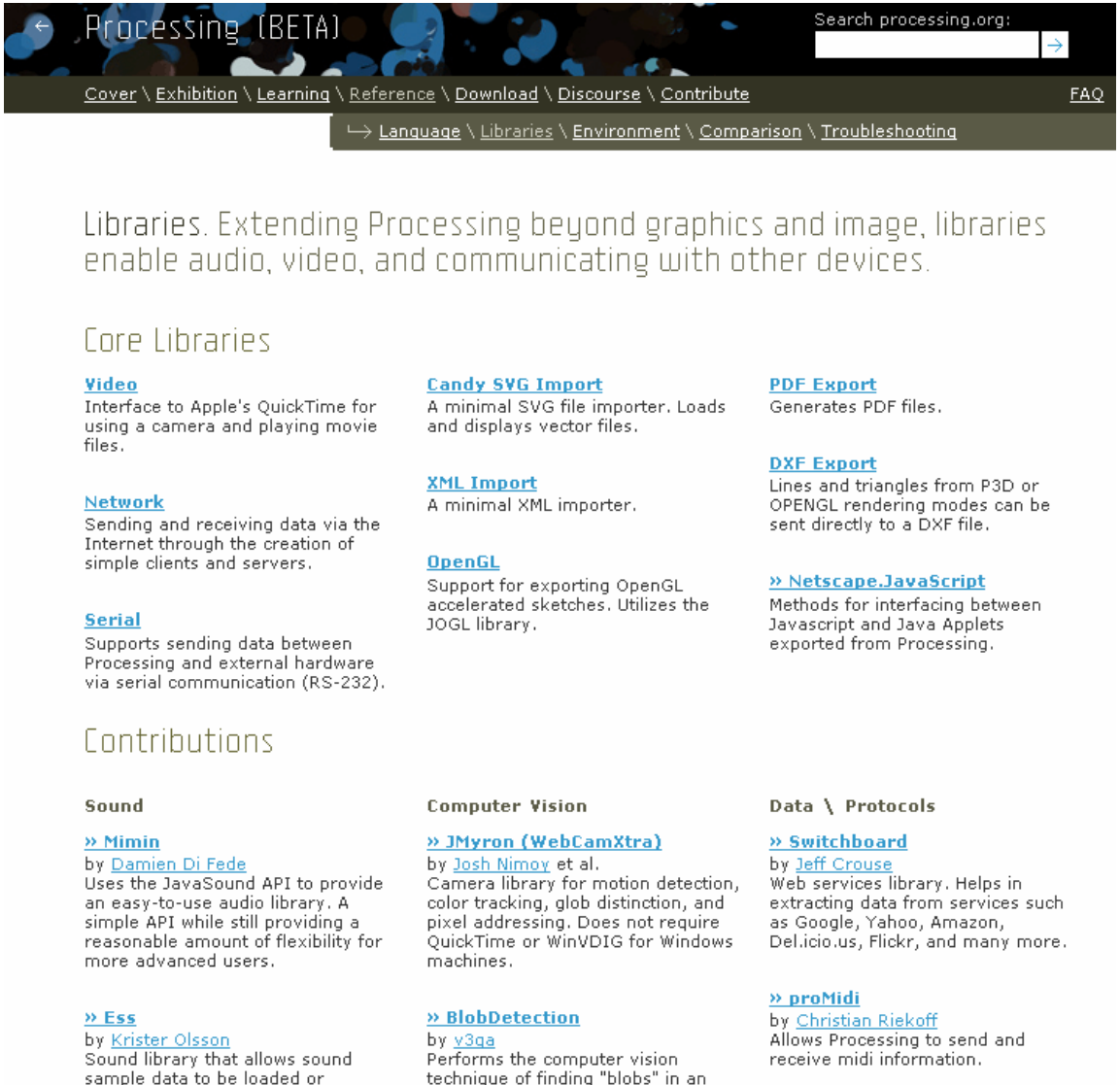
Libraries


Processing - 0124 Beta
File Edit Sketch Tools Help
Run Strg+R
Present Strg+Umschalt+R
Stop
Import Library
Show Sketch Folder Strg+K
Add File...
candy
dxf
javascript
minim
net
opengl
pdf
serial
video
xml
void draw() {
float s = random(20, 50);
ellipse(random(width), random(height), s,
}
Done Saving.
1

Libraries

Processing - 0124 Beta
File Edit Sketch Tools Help
ImportLib §
import processing.opengl.*;
void setup() {
size(400, 400);
}
void draw() {
float s = random(20, 50);
ellipse(random(width), random(height), s, s);
}
Done Saving.
11

Libraries



Processing (BETA)

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↪ Language \ Libraries \ Environment \ Comparison \ Troubleshooting

Libraries. Extending Processing beyond graphics and image, libraries enable audio, video, and communicating with other devices.

Core Libraries

Video
Interface to Apple's QuickTime for using a camera and playing movie files.

Network
Sending and receiving data via the Internet through the creation of simple clients and servers.

Serial
Supports sending data between Processing and external hardware via serial communication (RS-232).

Candy SVG Import
A minimal SVG file importer. Loads and displays vector files.

XML Import
A minimal XML importer.

OpenGL
Support for exporting OpenGL accelerated sketches. Utilizes the JOGL library.

PDF Export
Generates PDF files.

DXF Export
Lines and triangles from P3D or OPENGL rendering modes can be sent directly to a DXF file.

» Netscape.JavaScript
Methods for interfacing between Javascript and Java Applets exported from Processing.

Contributions

Sound

» Mimin
by Damien Di Fede
Uses the JavaSound API to provide an easy-to-use audio library. A simple API while still providing a reasonable amount of flexibility for more advanced users.

» Ess
by Krister Olsson
Sound library that allows sound sample data to be loaded or

Computer Vision

» JMyron (WebCamXtra)
by Josh Nimoy et al.
Camera library for motion detection, color tracking, glob distinction, and pixel addressing. Does not require QuickTime or WinVDIG for Windows machines.

» BlobDetection
by v3ga
Performs the computer vision technique of finding "blobs" in an

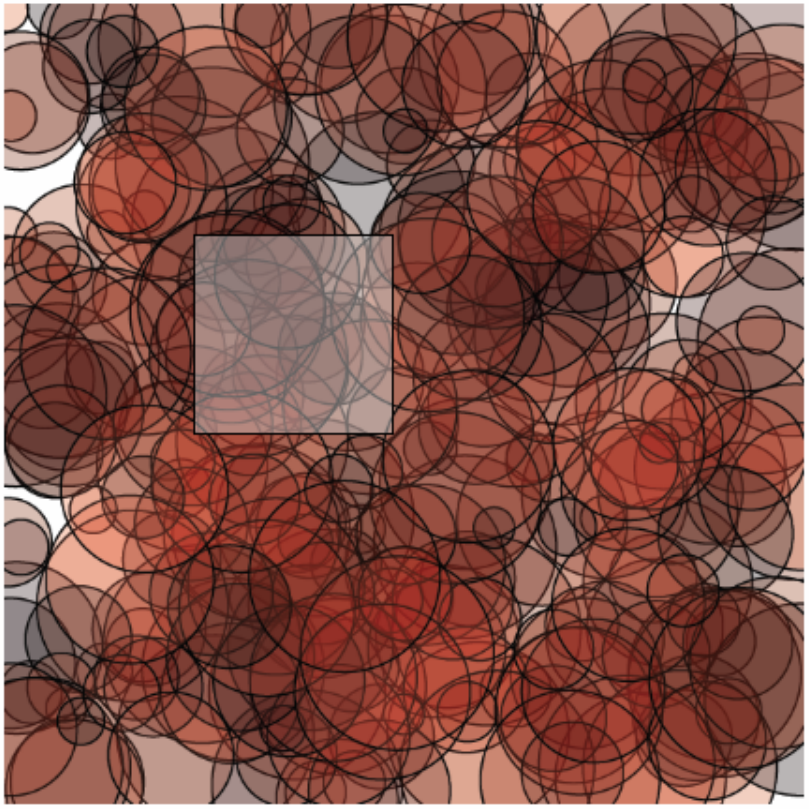
Data \ Protocols

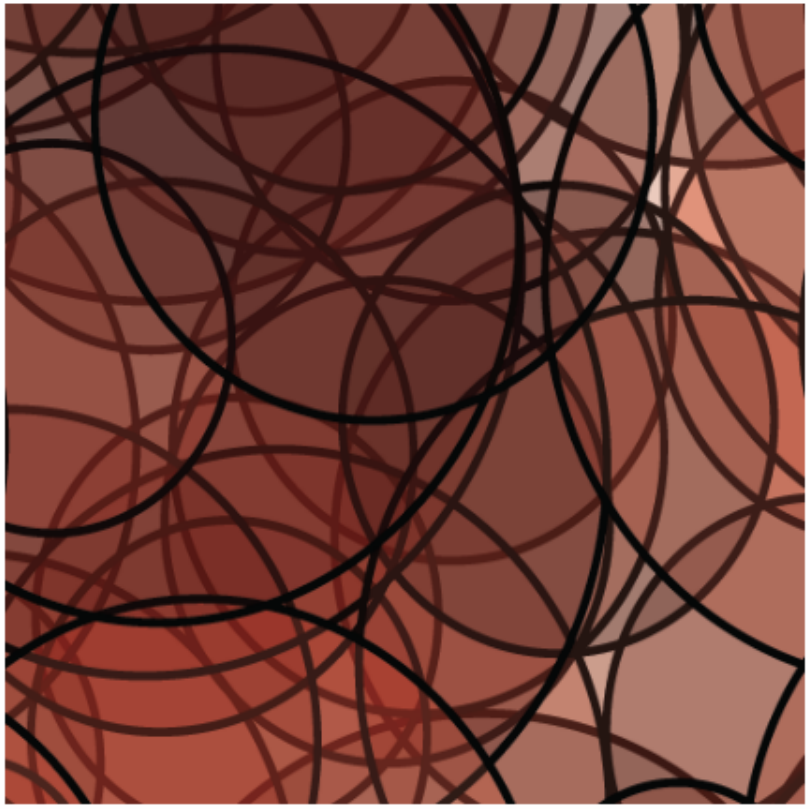
» Switchboard
by Jeff Crouse
Web services library. Helps in extracting data from services such as Google, Yahoo, Amazon, Del.icio.us, Flickr, and many more.

» proMidi
by Christian Riekoff
Allows Processing to send and receive midi information.

Vector vs pixel graphics

PDF creation





PDF creation

```
void setup() {
  size(400, 400);
  smooth();
  noLoop();
  background(255);
}

void draw() {
  for (int i = 0; i < 300; i++) {
    fill(random(255), 0, 0, 50);
    float s = random(20, 100);
    ellipse(random(width), random(height), s, s);
  }
}
```

PDF creation

```
import processing.pdf.*;

void setup() {
  size(400, 400, PDF, "example.pdf");
  smooth();
  noLoop();
  background(255);
}

void draw() {
  for (int i = 0; i < 300; i++) {
    fill(random(255), 0, 0, 50);
    float s = random(20, 100);
    ellipse(random(width), random(height), s, s);
  }
  exit();
}
```

Assignment

A2: Create a sketch where users can send and receive images. This can be a social software, an image generator, a gallery tool, a small game, etc.

Use and offer any kind of interaction. If you need special, non-integrative ways, do not use more than three buttons.

Or: Do something on your own.

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