

Creative Coding

Professor Danne Woo

creativecode.dannewoo.com

ARTS 249

Fall 2020

Thursday and Thursday 2:00 PM – 5:50 PM

ONLINE

What I do

- Graphic Designer
- UX and UI Designer
- Product Designer
- Game Designer
- Woodworker
- Musician
- Programmer
- Engineer
- Hacker
- Maker
- Entrepreneur
- Activist

Design Technologist

How I got here

- Designer parents
- Youngest ALGA member
- First typeface at 10
- Named after designer
- 10 year design career
- Studied design and technology at NYU

SPLAT

Join team two at splat.in/2



www.BIGPLAY.ME presents

SPLAT

1354
TEAM 1

1575
TEAM 2

0704
TEAM 3

0111
PLAYERS





Visualizing your data your way



Design



Data



Output



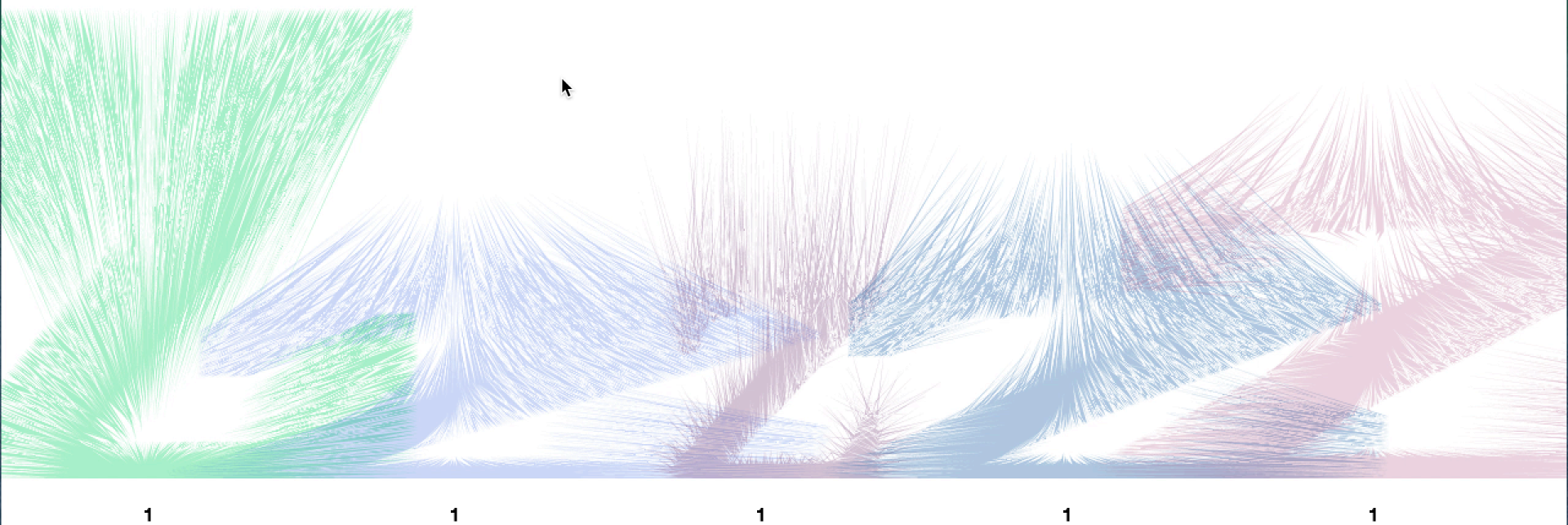
What is *datavisual*?

datavisual is a web-based tool for creating data visualizations. Perfect for designers and creatives with limited programming skills but a need to make beautiful charts and graphs. Once you design your chart style you can upload multiple data sets and output them as vector PDFs or SVGs as well as websafe PNGs.

MacBook Pro

A dimly lit home office scene. In the center, a computer monitor sits on a desk, displaying a website with a header and two main content areas. To the right of the monitor is a wooden chair with vertical slats. To the left, a window with white curtains is visible, with a small potted plant on the sill. The overall atmosphere is quiet and focused.

datavisual



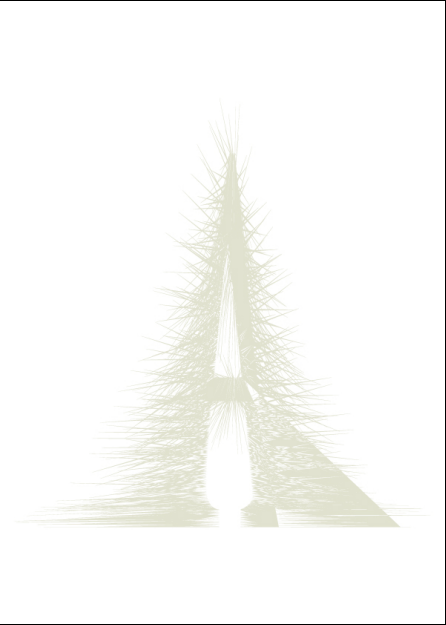
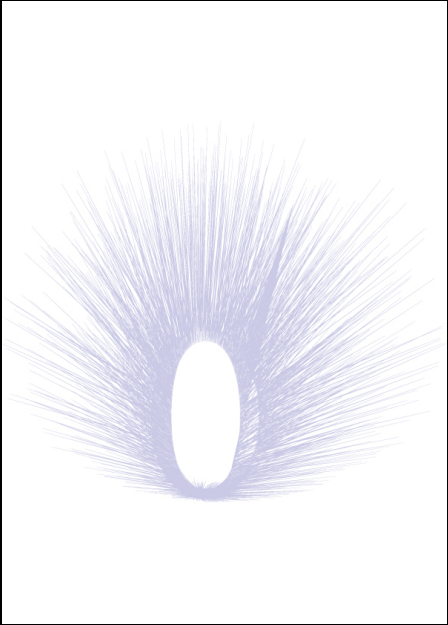
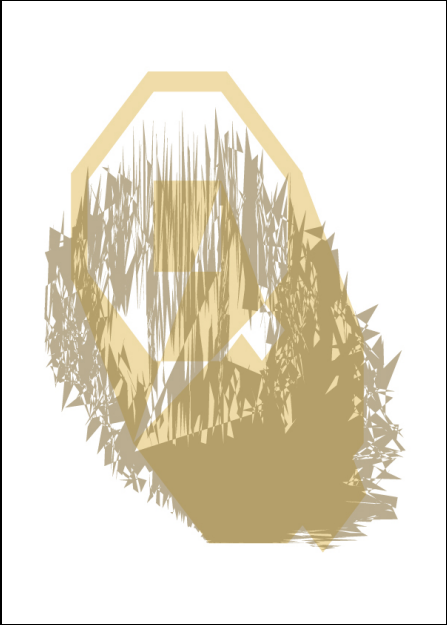
EVOLVE



Press -EVOLVE- to create a new generation

Generation Number: 0

Galapagos: Generative Type Design



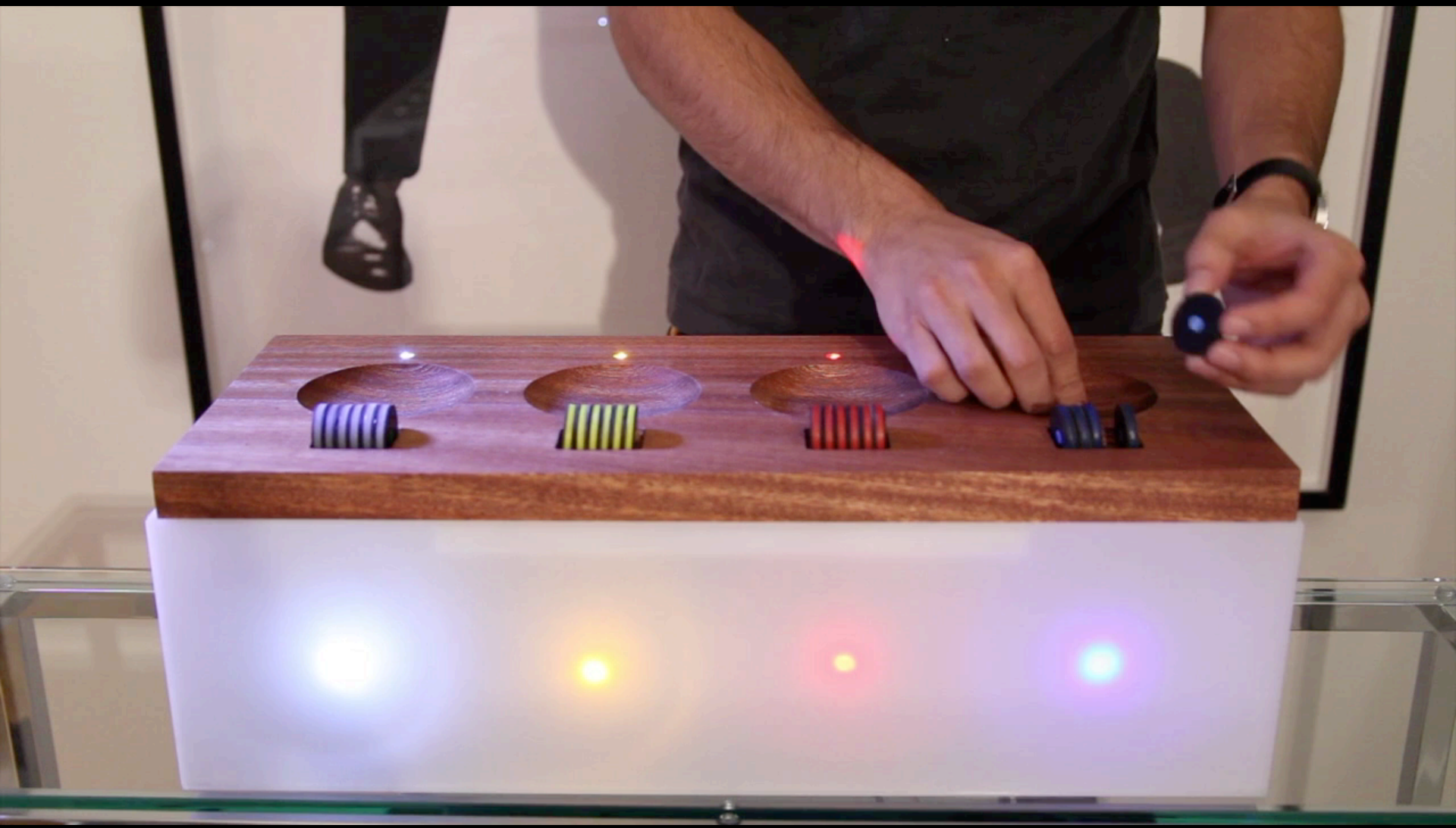
Aa Bb Cc Dd Ee

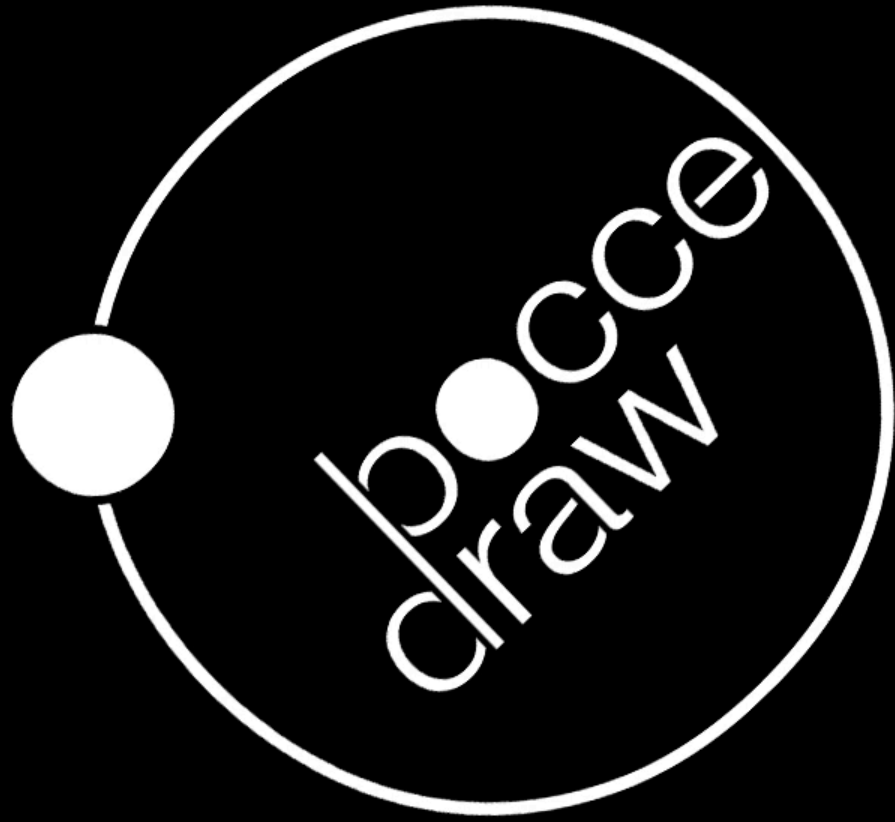
Ff Gg Hh Ii Jj Kk

Ll Mm Nn Oo Pp

Qq Rr Ss Tt Uu

Vv Ww Xx Yy Zz







TRUMP

Your turn.

Who are you?

Where are you?

Why are you interested in this class?

What are you passionate about?

Class Structure

Week 1 – 7: Static Visual Design

Week 8 – 15: Motion and Interactivity

Static Visual Design

Week 01: Intro to Creative Coding and Processing

Week 02: Forms, Shapes and Variables

Week 03: Computational Color and Export

Week 04: Repetition, Decisions and Randomization

Week 05: Functions, Classes and Typography

Week 06: Data Visualization

Week 07: Midterm Presentation

Motion and Interactivity

Week 08: Kinetic Forms

Week 09: Drawing and Interaction (Mouse)

Week 10: Interaction and Image Import (Keyboard and Events)

Week 11: 3D

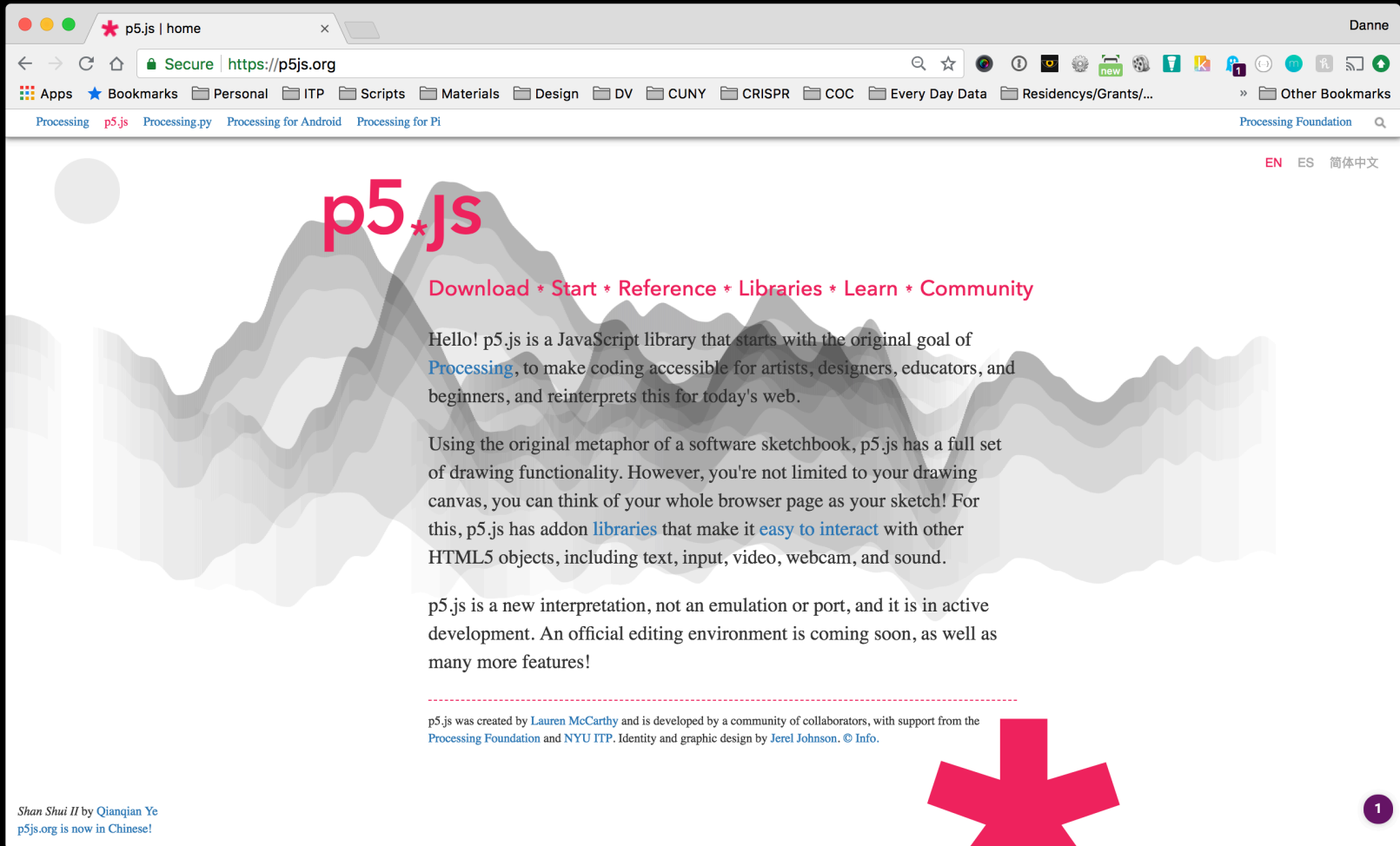
Week 12: Audio and Minim

Week 13: Computer Vision

Week 14: Final Presentation

p5js

www.p5js.org



p5.js | home

Secure | <https://p5js.org>

Apps | Bookmarks | Personal | ITP | Scripts | Materials | Design | DV | CUNY | CRISPR | COC | Every Day Data | Residencys/Grants/... | Other Bookmarks

Processing | p5.js | Processing.py | Processing for Android | Processing for Pi

Processing Foundation

EN ES 简体中文

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 add-on [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 many more features!

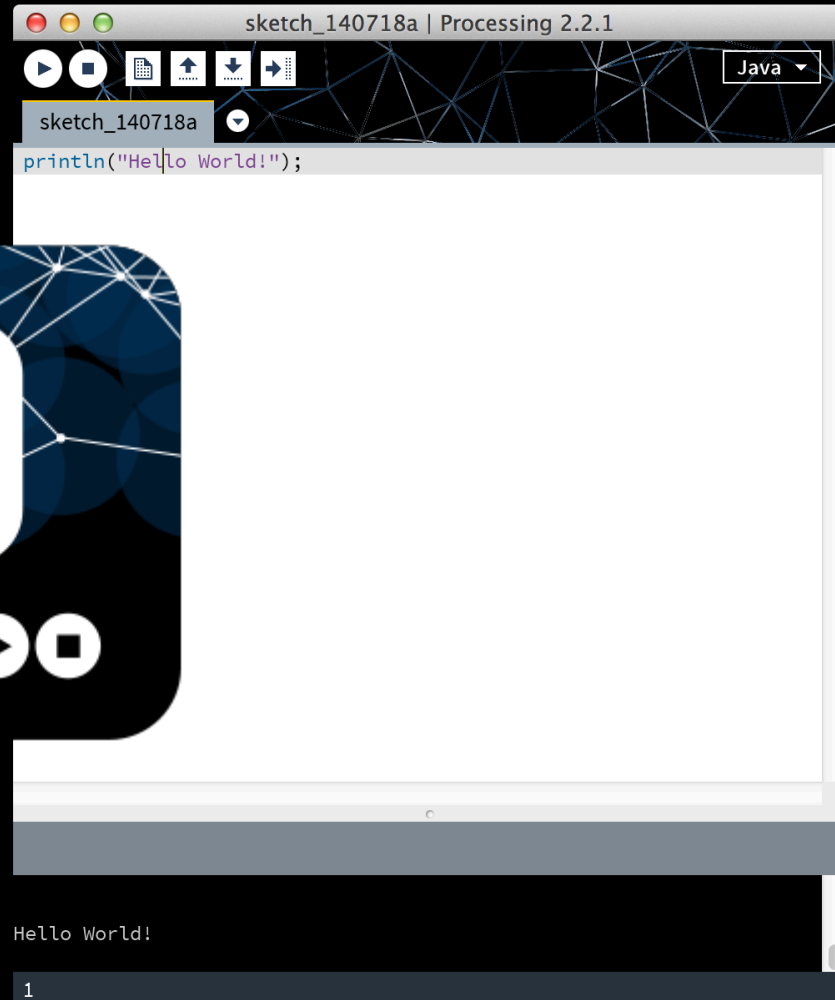
p5.js was created by [Lauren McCarthy](#) and is developed by a community of collaborators, with support from the [Processing Foundation](#) and NYU ITP. Identity and graphic design by [Jerel Johnson](#). © [Info](#).

Shan Shui II by Qianqian Ye
p5js.org is now in Chinese!

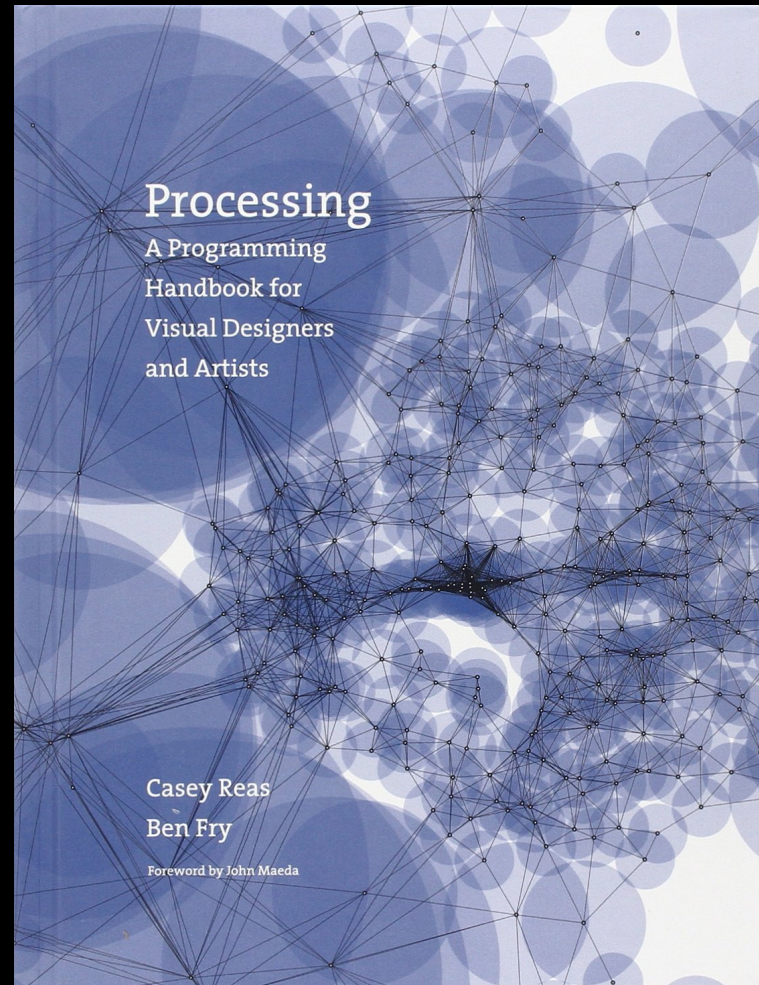
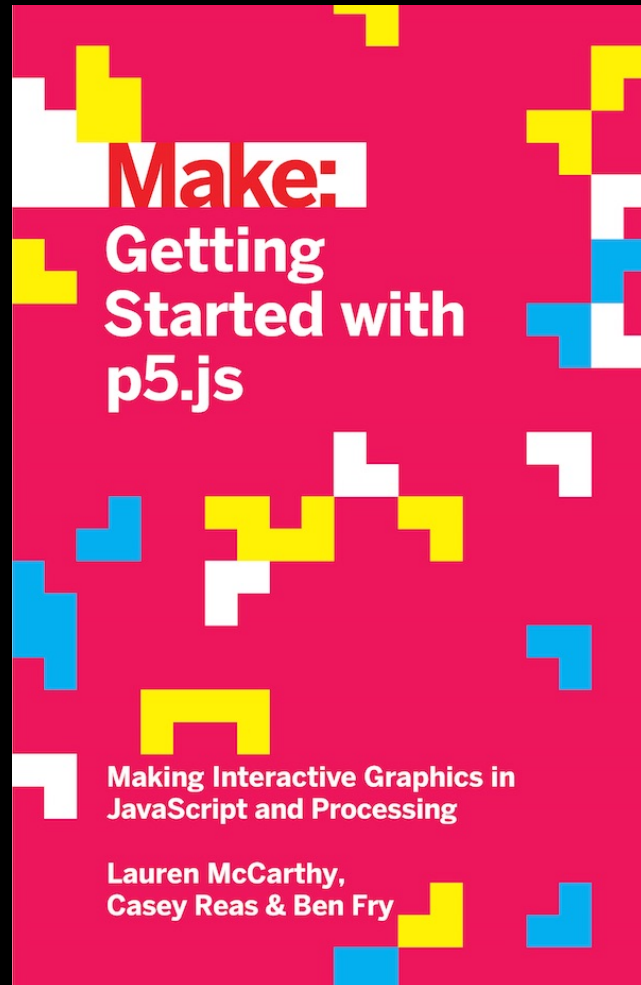
1

Processing

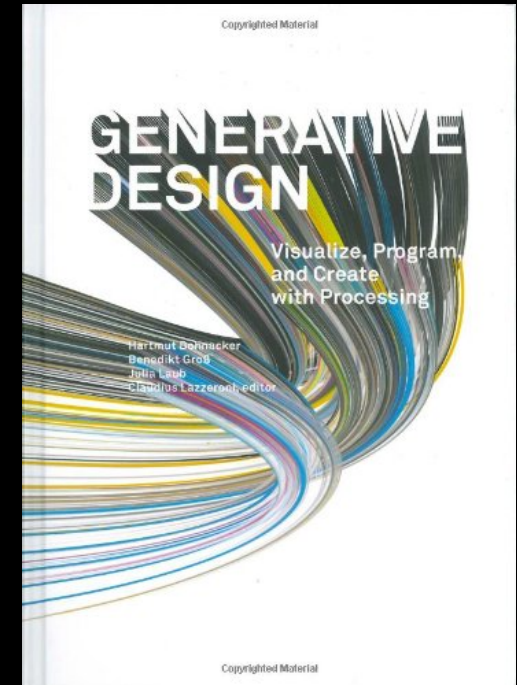
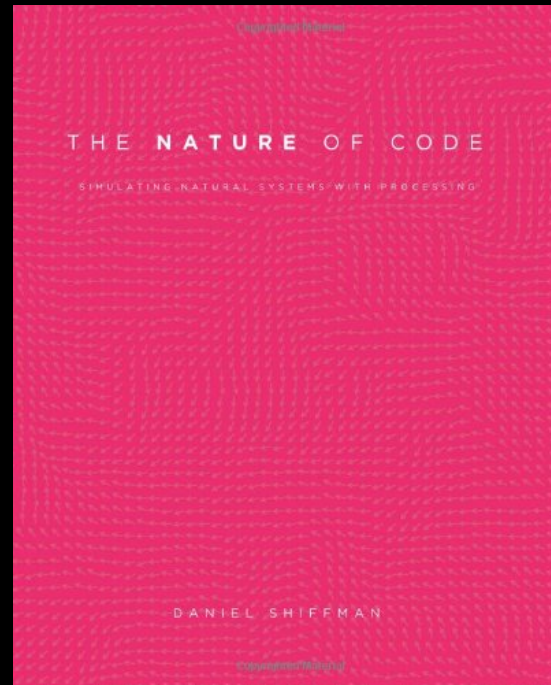
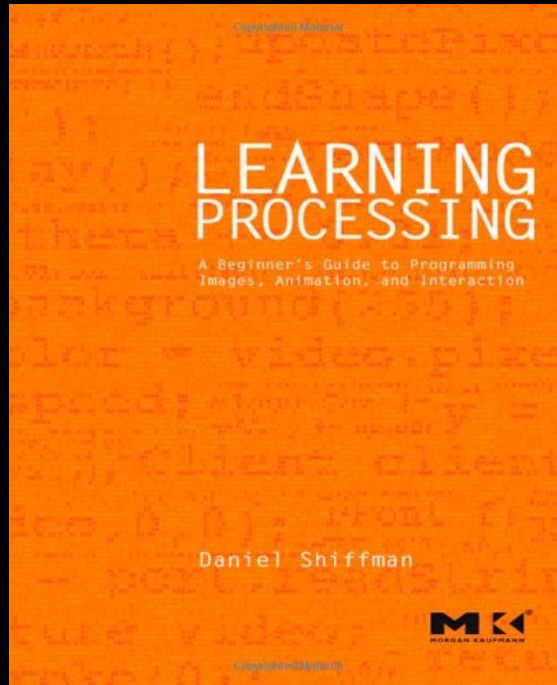
www.processing.org



Optional Class Textbooks



Other Suggested Reading

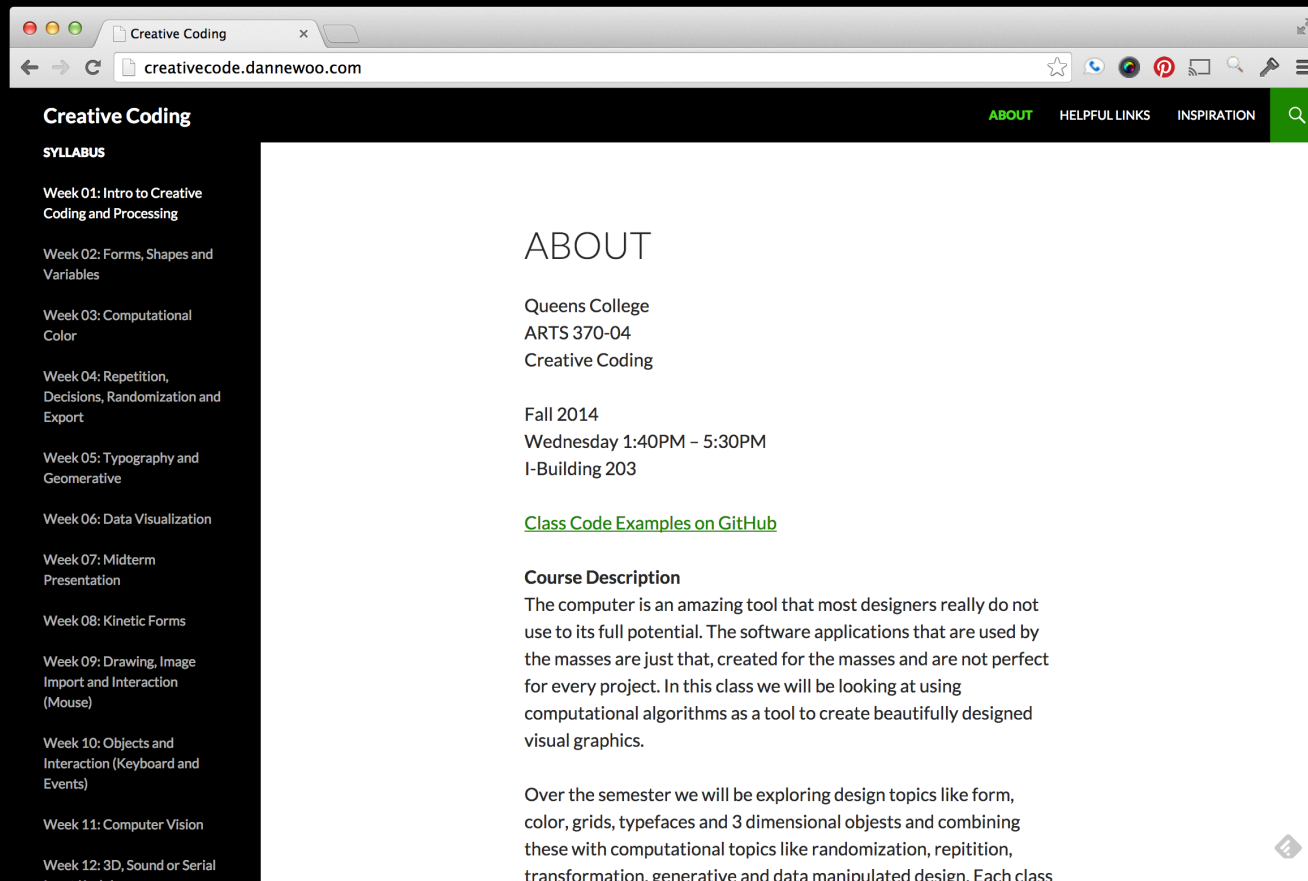


“The possibilities of programming languages such as Processing will change the role of the designer. We are experiencing a paradigm shift in design that will lead to new realms of visual imagery. Knowledge of this change, however, has been somewhat inaccessible. Until now, designers have used the tools that programmers have developed for them, which has forced designers to adjust to their systems.”

- Generative Design

Class Website

creativecode.dannewoo.com



Class github account

github.com/dannewoo/creativecode

The screenshot shows the GitHub repository page for `dannewoo/creativecode`. The browser address bar displays the URL `https://github.com/dannewoo/creativecode`. The repository name `dannewoo / creativecode` is shown at the top, along with statistics: 1 Unwatch, 1 Star, 0 Fork, and 0 contributors. Below this, the repository is described as "Example Code for the Creative Coding class". The commit history shows 22 commits, 1 branch (master), 0 releases, and 1 contributor. The latest commit is by `dannewoo` 8 days ago, with the message "Name change." and commit hash `b1f797f68b`. A table of recent commits is displayed:

Commit Message	Author	Time Ago
Week01_Intro/intro_processing	dannewoo	11 days ago
Week02_Form_Shape	dannewoo	8 days ago
README.md	dannewoo	a month ago

The `README.md` file is open, showing the title "Creative Coding Class" and the URL `http://creativecode.dannewoo.com`. The "Course Description" section states: "The computer is an amazing tool that most designers really do not use to its full potential. The software applications that are used by the masses are just that, created for the masses and are not perfect for every project. In this class we will be looking at using computational algorithms as a tool to create beautifully designed visual graphics."

On the right sidebar, there are links to Code, Issues, Pull Requests, Wiki, Pulse, Graphs, and Settings. At the bottom, there are buttons for "Clone in Desktop" and "Download ZIP".

For Class

1. Sketchbook (Moleskin or similar)
2. Be prepared to talk about your homework

Deliverables

You will be using p5js to design with code a static midterm and interactive final.

Midterm

Using the p5js web editor, design a poster around a topic or movement that you are passionate about (i.e. DACA, Black Lives Matter, guns, immigration, etc.). You are free to choose your topic but must use the techniques we have gone over in class to execute it. You will be required to present your p5js sketch and share your code.

Final

Using the p5js web editor, design and program an interactive project. This can again be on a topic of your choosing like a game, animation, software or artistic project. You will be required to present this project and the code on the last day of class.

All students will be required to present their midterm at week 7 and final at week 14.

Grading

80% Assignments

20% Class Participation

Check the class website for a detailed description on how to achieve each grade.

Attendance

BE HERE AND DON'T BE LATE!

2 unexcused absences will mean a drop in your grade

3 will drop again

4 will be an F

Slack

The screenshot displays the Slack desktop application interface. On the left is a sidebar with a dark theme. At the top of the sidebar is the 'QC Design' workspace with a dropdown arrow and a profile icon for 'Danne Woo'. Below this are icons for various apps: QC, MC, T, QD, and a search icon. A '+' button is at the bottom of this section. The middle section of the sidebar lists channels and direct messages. Under 'Channels', there are links to 'creative-coding-fall2020-thu...', 'creative-coding-fall2020-tue...', and the currently selected 'creative-coding-spring2020' channel. Below channels are 'general', 'info-design-fall2020', 'info-design-spring2020', 'peer-counseling', and 'random'. Under 'Direct messages', there are links to 'Slackbot', 'Danne Woo (you)', 'Celina Bertini', 'Cynthia Henriquez', 'Faith Mayan', 'Leana Macaya', and 'Mauricio Gonzalez'. The main area on the right shows the conversation for the 'creative-coding-spring2020' channel. At the top of this area is a search bar with the text 'Search QC Design' and a 'Details' link. The conversation history shows three messages: 1. A message from an unnamed user saying 'Thank you, Professor !! And amazing work ev' with 1 heart reaction and a timestamp of 'Thursday, May 21st'. 2. A message from 'Danne Woo' at 3:04 PM saying 'If you guys have any other questions in the future please feel free to Slack or email me' with 2 reactions. 3. A message from 'Faith Mayan' at 3:04 PM saying 'Thank you for being so patient and understanding through this mess, you rock!' with 1 heart reaction. Below these is a message from 'Danne Woo' at 3:05 PM saying 'bye (483 kB)' with a file icon. The file is a cartoon image of SpongeBob SquarePants standing in a doorway, pointing. At the bottom of the main area is a text input field with the placeholder 'Message creative-coding-spring2020' and a rich text editor toolbar with icons for bold, italic, link, unlink, quote, code, and more. To the right of the input field are icons for text formatting (Aa), mentions (@), emojis, and a send button.

Programming Languages

Markup

HTML

CSS

XML

Programming Languages

Markup

HTML

```
<h1>This is a header</h1>
```

CSS

```
h1 {  
    color: red;  
}
```

Programming Languages

Object Oriented Programming Languages

Computer/Server

Java

C++

Python

PHP

Web/Browser

JavaScript

Mobile

C#

Programming Frameworks

Java

Processing

C++

openFrameworks

Cinder

JavaScript

Twitter Bootstrap

JQuery

Foundation

D3js

p5js

p5.js

Download * Start * Reference * Libraries * Learn * Community

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p5.js was created by [Lauren McCarthy](#) and is developed by a community of collaborators, with support from the [Processing Foundation](#) and [NYU ITP](#). Identity and graphic design by [Jerel Johnson](#). © [Info](#).



p5.js

Processing community times JavaScript community

- Home
- Download
- Start
- Reference
- Libraries
- Learn
- Examples
- Books
- Community
- Forum
- GitHub
- Twitter

Download

Complete Library

p5.js complete

★

Includes:
p5.js, p5.dom.js, p5.sound.js, and an example project
Version 0.7.1 (August 10, 2018)

Single Files

p5.js

Single file:
Full uncompressed version

p5.min.js

Single file:
Compressed version

CDN

Link:
Statically hosted file

ETC



p5.js

Processing community times JavaScript community

Home

Reference

Search the API

Download

Can't find what you're looking for? You may want to check out [p5.dom](#) or [p5.sound](#).

Start

You can download an offline version of the reference [here](#).

Reference

Color

Data

Image

Shape

Libraries

Constants

Environment

Lights, Camera

Structure

Conversion

Events

Math

Transform

Learn

DOM

IO

Rendering

Typography

Examples

Books

Color

Community

Creating &

Setting

Reading

`background()`

`alpha()`

`clear()`

Forum

`blue()`

`colorMode()`

GitHub

`brightness()`

`fill()`

`color()`

`noFill()`

Twitter

`green()`

`noStroke()`

`hue()`

`stroke()`

`lerpColor()`

`lightness()`

p5.js

Processing simplicity times JavaScript flexibility

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- Download
- Start
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Libraries



p5.dom lets you interact with HTML5 objects beyond the canvas, including video, audio, webcam, input, and text.



p5.sound extends p5 with Web Audio functionality including audio input, playback, analysis and synthesis.



p5.accessibility makes the p5 canvas more accessible to people who are blind and visually impaired.

SUBSCRIBE

Example Functions

Rectangle Function

`rect(x, y, width, height);`

Ellipse or Circle Function

`ellipse(x, y, width, height);`

Example Functions

`rect(5, 8, 5, 5);`

`rect(x, y, width, height);`

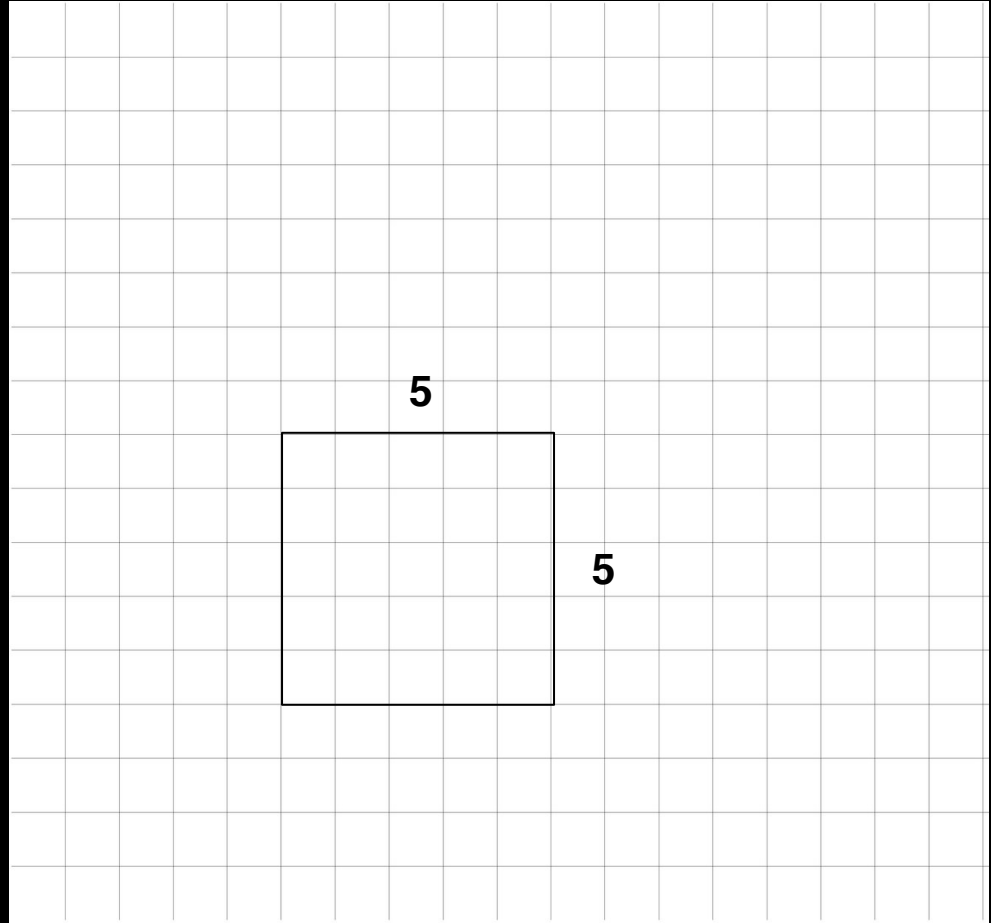
0, 0

5

8

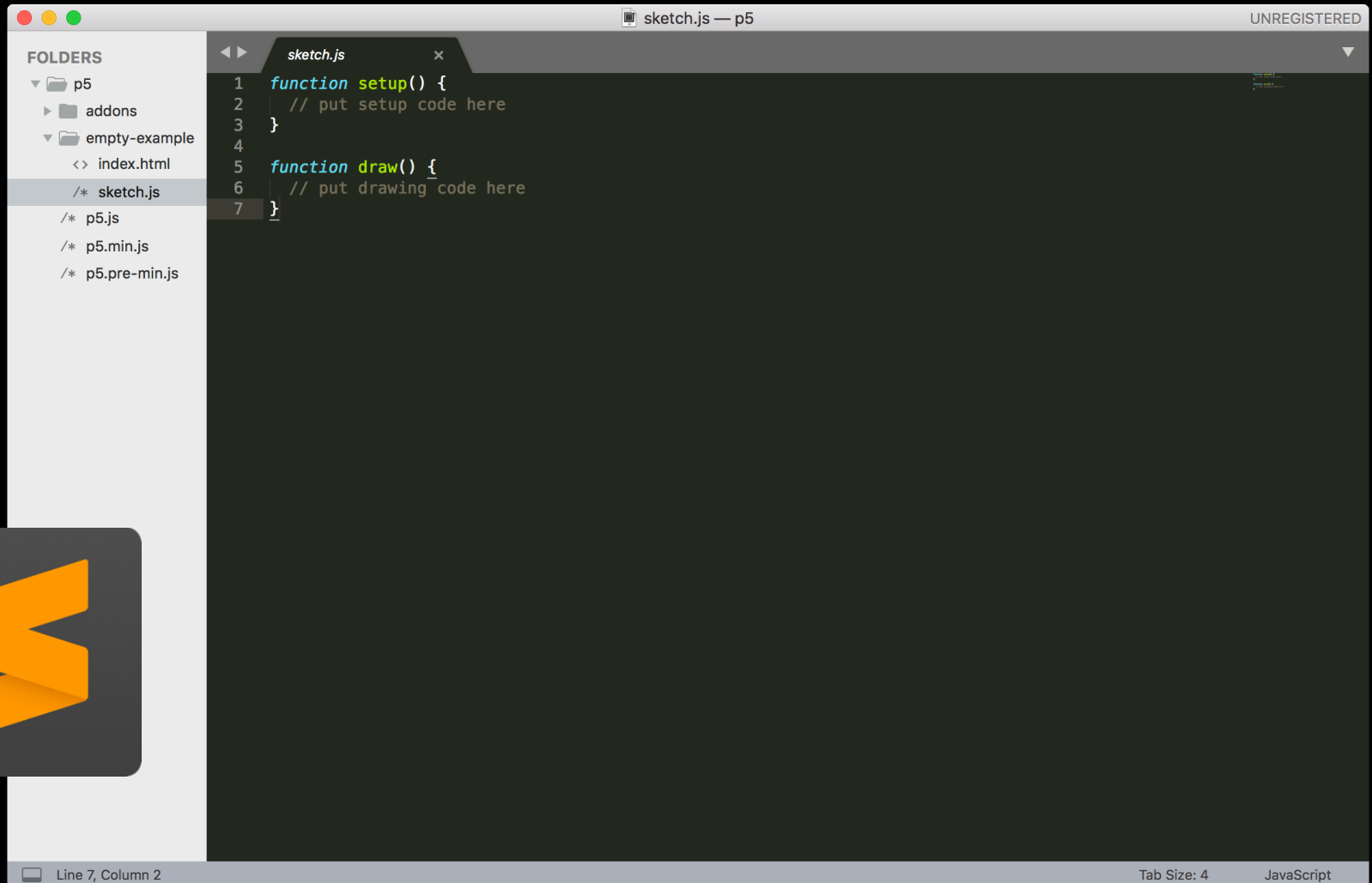
5

5



Programming with p5js

Sublime Text 3 / www.sublimetext.com/3



p5js web editor

editor.p5js.org

The screenshot shows the p5.js Web Editor interface in a web browser. The browser's address bar displays the URL `alpha.editor.p5js.org/dannewoo/sketches/rkzNNU4vm`. The page title is "p5.js Web Editor | Simple Example". The browser's bookmark bar shows various folders like "Personal", "ITP", "Scripts", "Materials", "Design", "DV", "CUNY", "CRISPR", "COC", "Every Day Data", and "Residencys/Grants/...".

The p5.js Web Editor interface includes a top navigation bar with the "p5*" logo and menu items: "File", "Edit", "Sketch", and "Help & Feedback". On the right side of the top bar, it says "Hello, dannewoo!" and "My Account".

Below the top bar, there is a toolbar with a play button, a stop button, and a checkbox for "Auto-refresh" which is checked. Next to it is the text "Simple Example" and "by dannewoo". A settings gear icon is located on the far right of the toolbar.

The main workspace is divided into two sections. The left section is a file explorer showing a "project-folder" containing "sketch.js", "index.html", and "style.css". The right section is a code editor displaying the contents of "sketch.js":

```
1 function setup() {  
2   createCanvas(400, 400);  
3 }  
4  
5 function draw() {  
6   background(220);  
7   rect(mouseX, mouseY, 100, 100);  
8 }
```

Below the code editor is a console area with the label "Console" and a "Clear" button.

Why?



Limited to Tools

vs



Vector Based
Repetition
Patterns

Randomization
Data Driven Design
Custom Functions
Custom Algorithms
Custom GUI

FREE

Rune Madsen

Tiny Artists 4-6

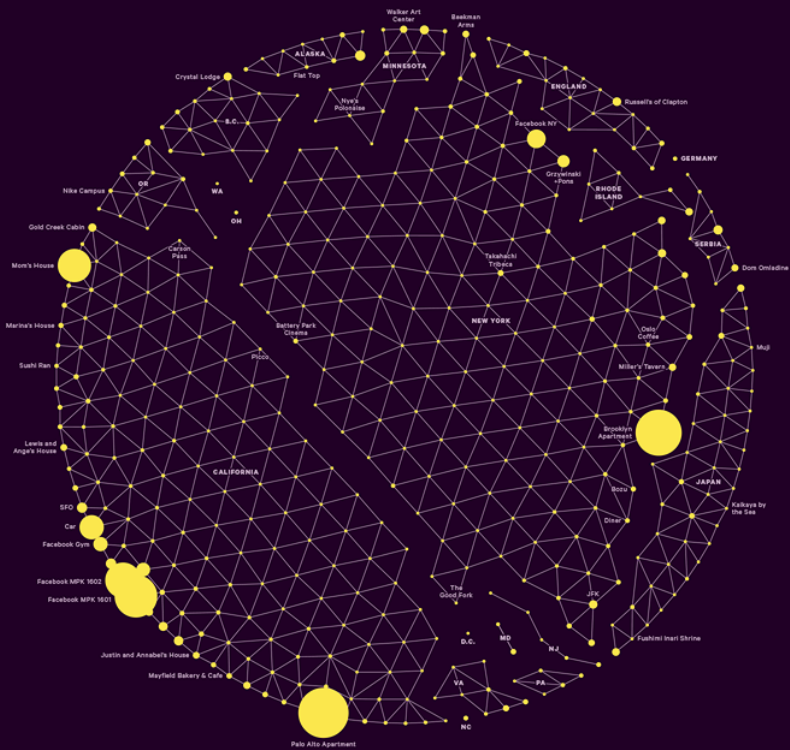


Nicholas Felton

Feltron Annual Reports

The Annual Report of

FELTRON 2012



The Feltron Biennial Report

2010 / 2011



WHO, WHEN AND WHERE

The Green Eyl

MIT Media Lab Logo



MIT MEDIA LAB

Daniel Franke & Cedric Kiefer

Unnamed Sound Sculpture



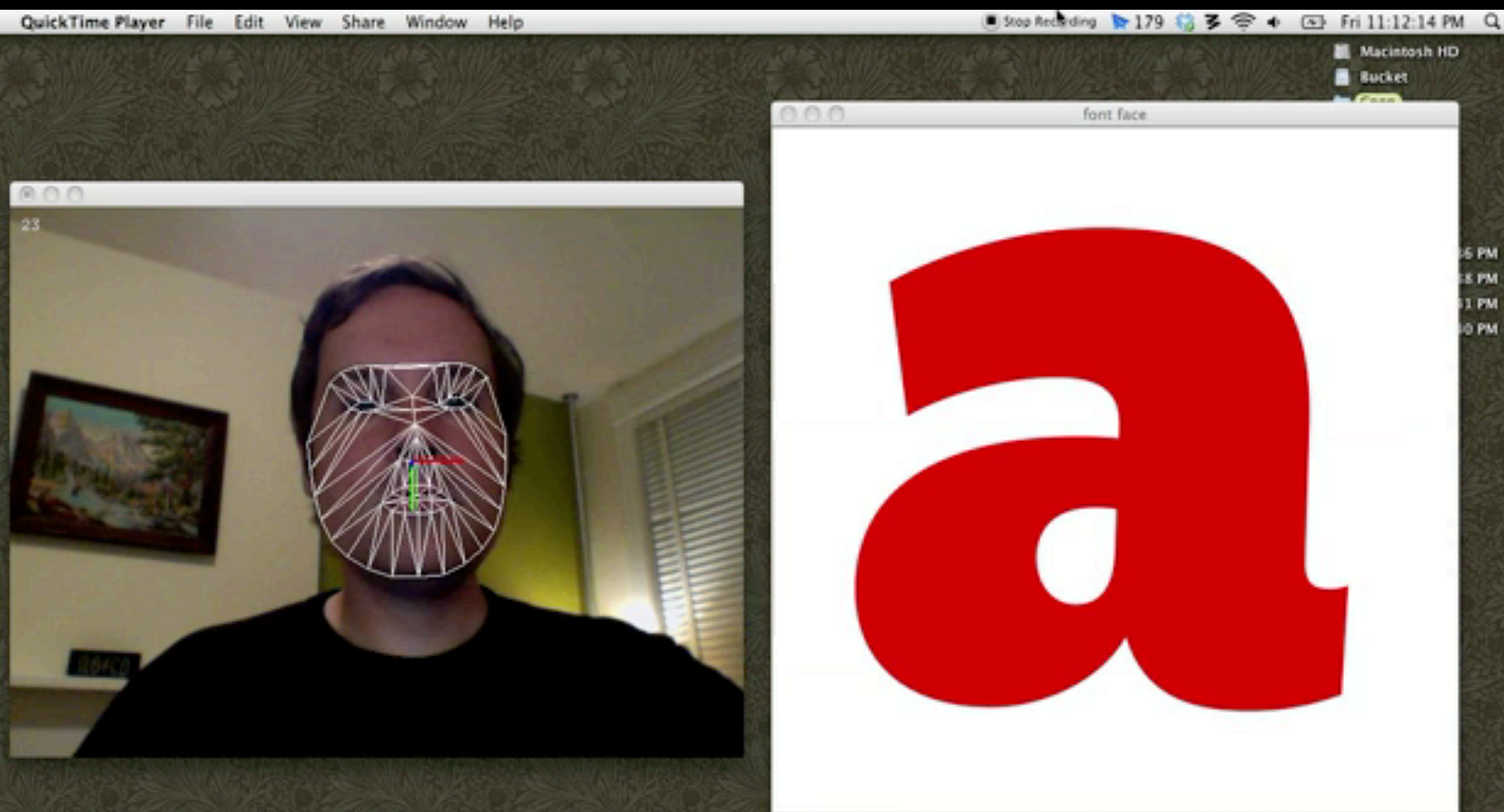
Quayola

Strata #3



Andy Clymer

Font-Face



Kyle McDonald

Face Substitution



Golan Levin

Augmented Hand Series

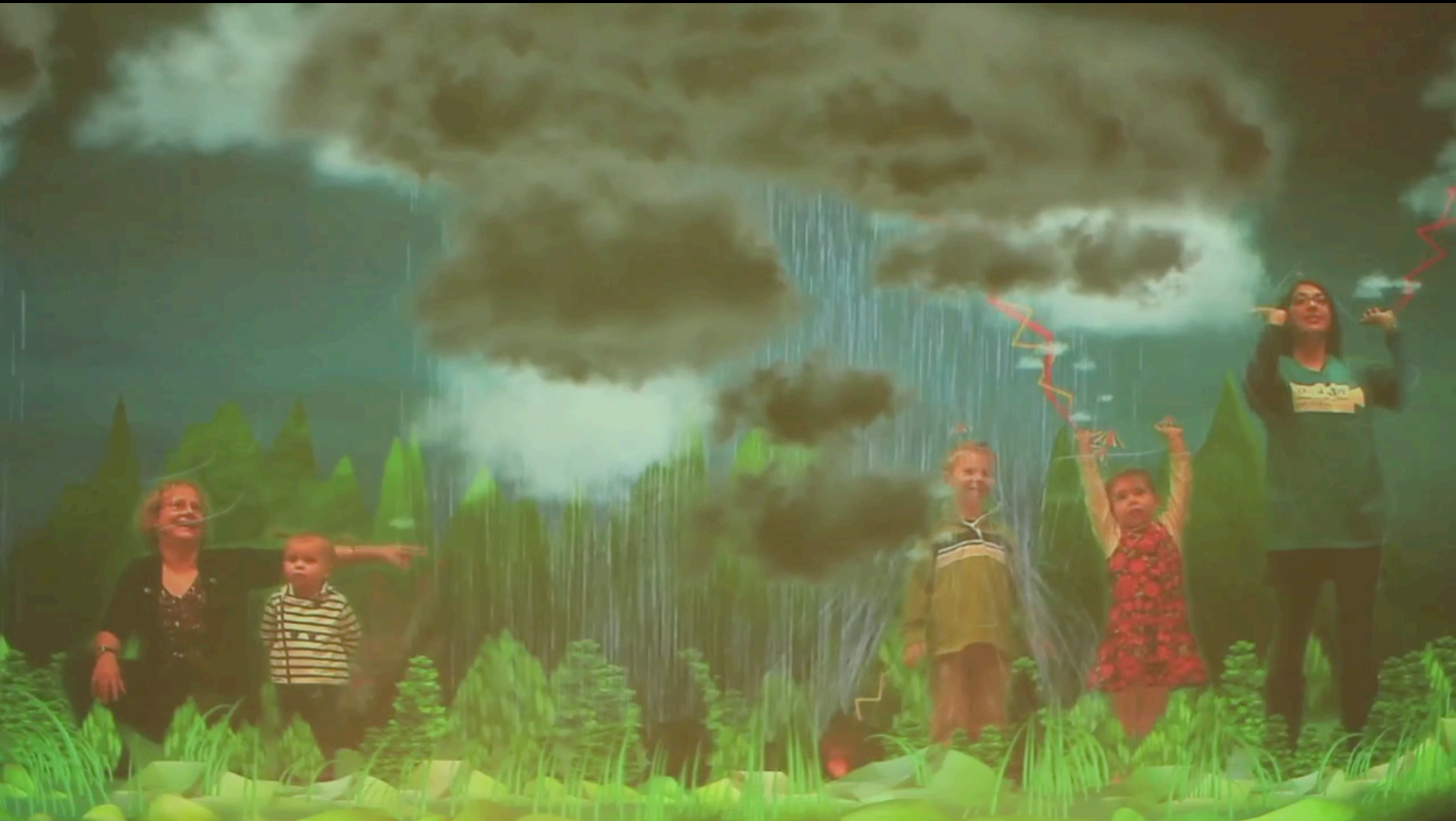


Minus One



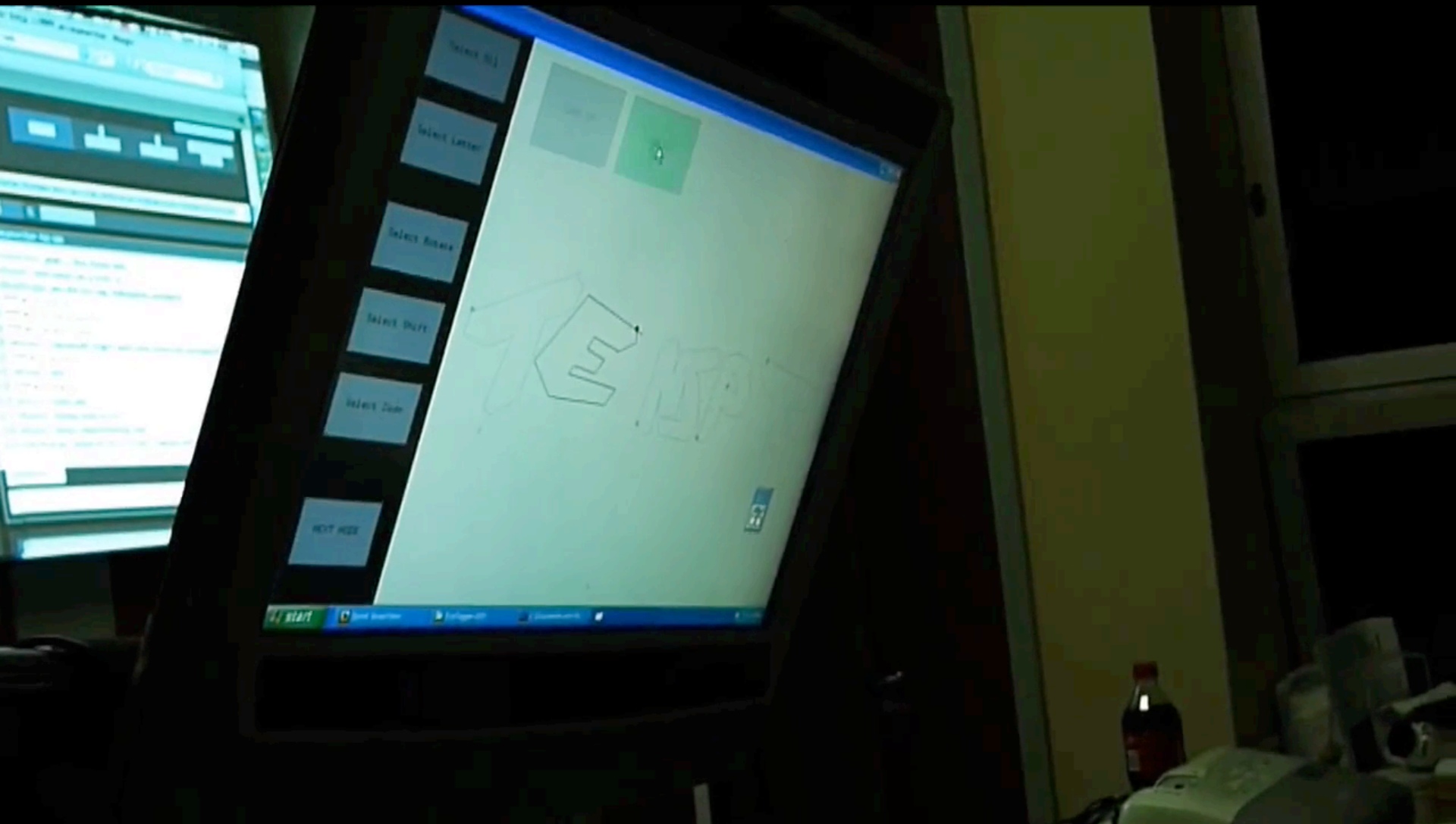
Design I/O

Weather Worlds



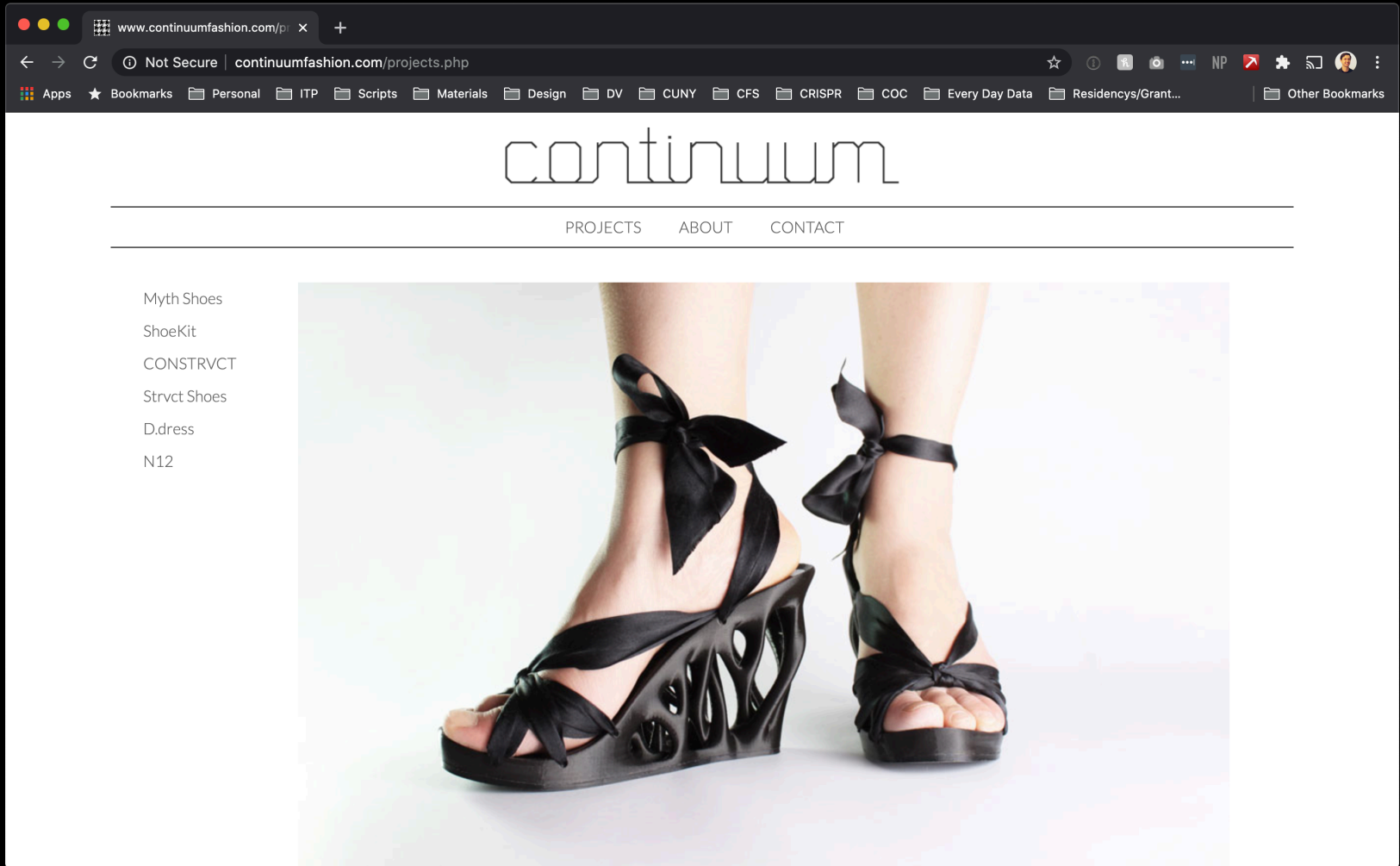
Zach Lieberman

Eyewriter



Mary Huang

Continuum Fashion



James George and Jonathan Minard

Clouds Documentary



C L O U D S

Demo

1. **p5js website**
2. **Look at the reference library**
3. **Create an account on editor.p5js.org**
4. **Create a simple sketch**

p5js Web Editor

editor.p5js.org

The screenshot shows the p5.js Web Editor interface in a web browser. The browser's address bar displays the URL `alpha.editor.p5js.org/dannewoo/sketches/rkzNNU4vm`. The browser's bookmark bar shows various folders like 'Personal', 'ITP', 'Scripts', 'Materials', 'Design', 'DV', 'CUNY', 'CRISPR', 'COC', 'Every Day Data', and 'Residencys/Grants/...'. The p5.js Web Editor interface has a top navigation bar with 'File', 'Edit', 'Sketch', and 'Help & Feedback' menus. A user greeting 'Hello, dannewoo!' and a 'My Account' link are visible. Below the navigation bar, there are buttons for 'Run' (a play icon) and 'Stop' (a square icon), along with a checkbox for 'Auto-refresh' and the text 'Simple Example by dannewoo'. A settings gear icon is in the top right corner. The main workspace is divided into three sections: a file explorer on the left showing a 'project-folder' containing 'sketch.js', 'index.html', and 'style.css'; a central code editor showing the following JavaScript code:

```
1 function setup() {  
2   createCanvas(400, 400);  
3 }  
4  
5 function draw() {  
6   background(220);  
7   rect(mouseX, mouseY, 100, 100);  
8 }
```

The code editor indicates it was 'Saved: 3 hours ago'. To the right of the code editor is a 'Preview' window. At the bottom of the interface is a 'Console' area with a 'Clear' button.

In Class Assignment

1. Sign up for Slack.
2. Send an email using the email address you use for Slack to dwoo@qc.cuny.edu so I can add you to the class Slack channel.

Homework

1. Read through the Getting Started page:
p5js.org/get-started
2. Click around and look at some of the examples:
p5js.org/examples/
3. Be prepared to share your favorite example in class next week.
4. Watch Dan Shiffman's Coding Train videos introducing p5js and the p5js web editor. Links found on class website.
5. Watch the video of the Week 2 lecture and come with questions to our Slack class next week.

Creative Coding

Professor Danne Woo

dwoo@qc.cuny.edu

creativecode.dannewoo.com