

The background of the slide is a light gray color. It is decorated with a pattern of vertical bars of varying heights and widths, and horizontal lines, creating a textured, almost barcode-like effect. The bars are a slightly darker shade of gray than the background. The horizontal lines are thin and spaced out. The overall effect is modern and digital.

# Creative Coding for the Web

Michael Hadley

# Overview

- Art made on/for/with the web
- Coding setup
- p5 and the web
- Lab: translating images/videos/audio into designs



# Web Art

# wind map

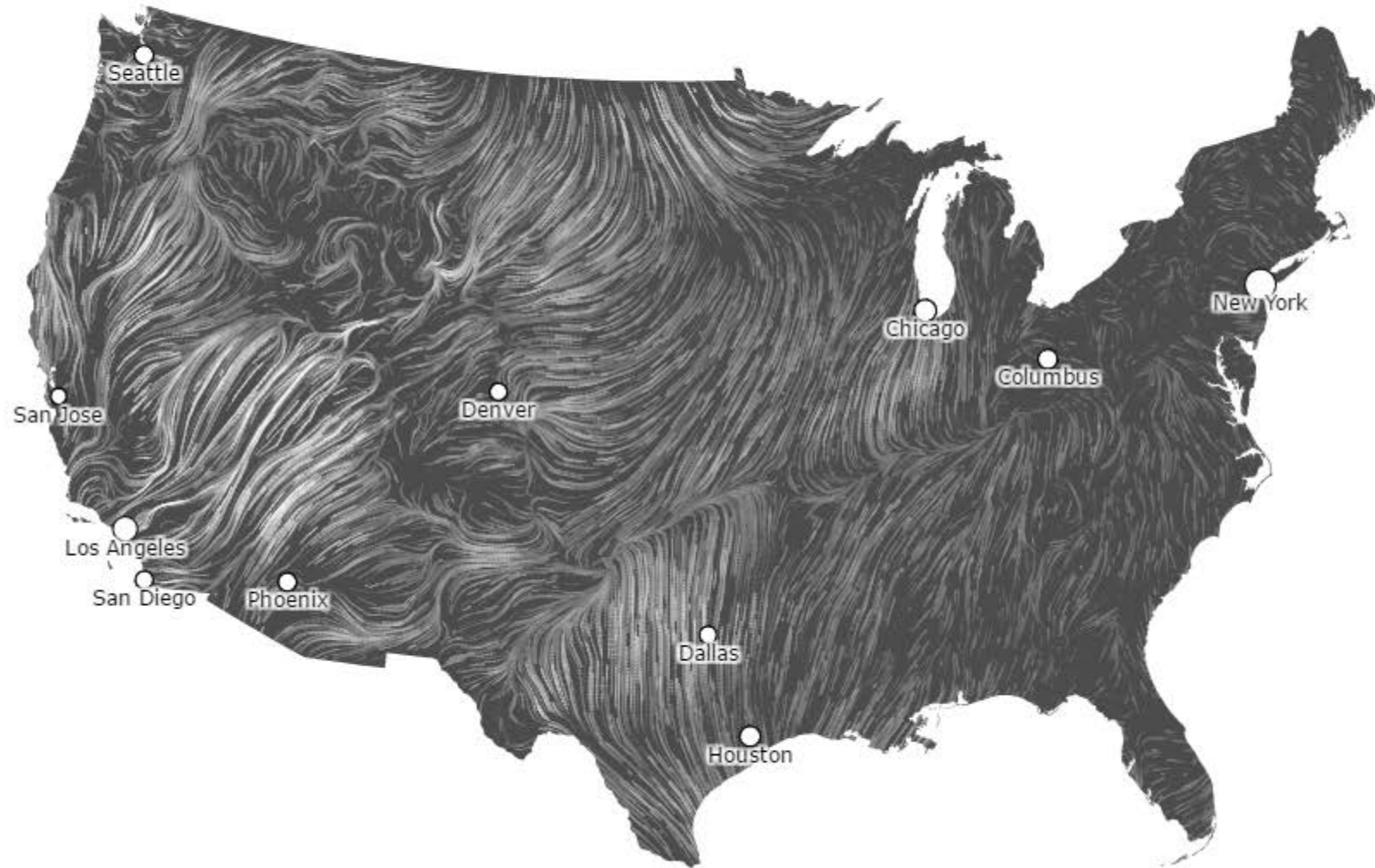
**March 20, 2017**

9:35 pm EST

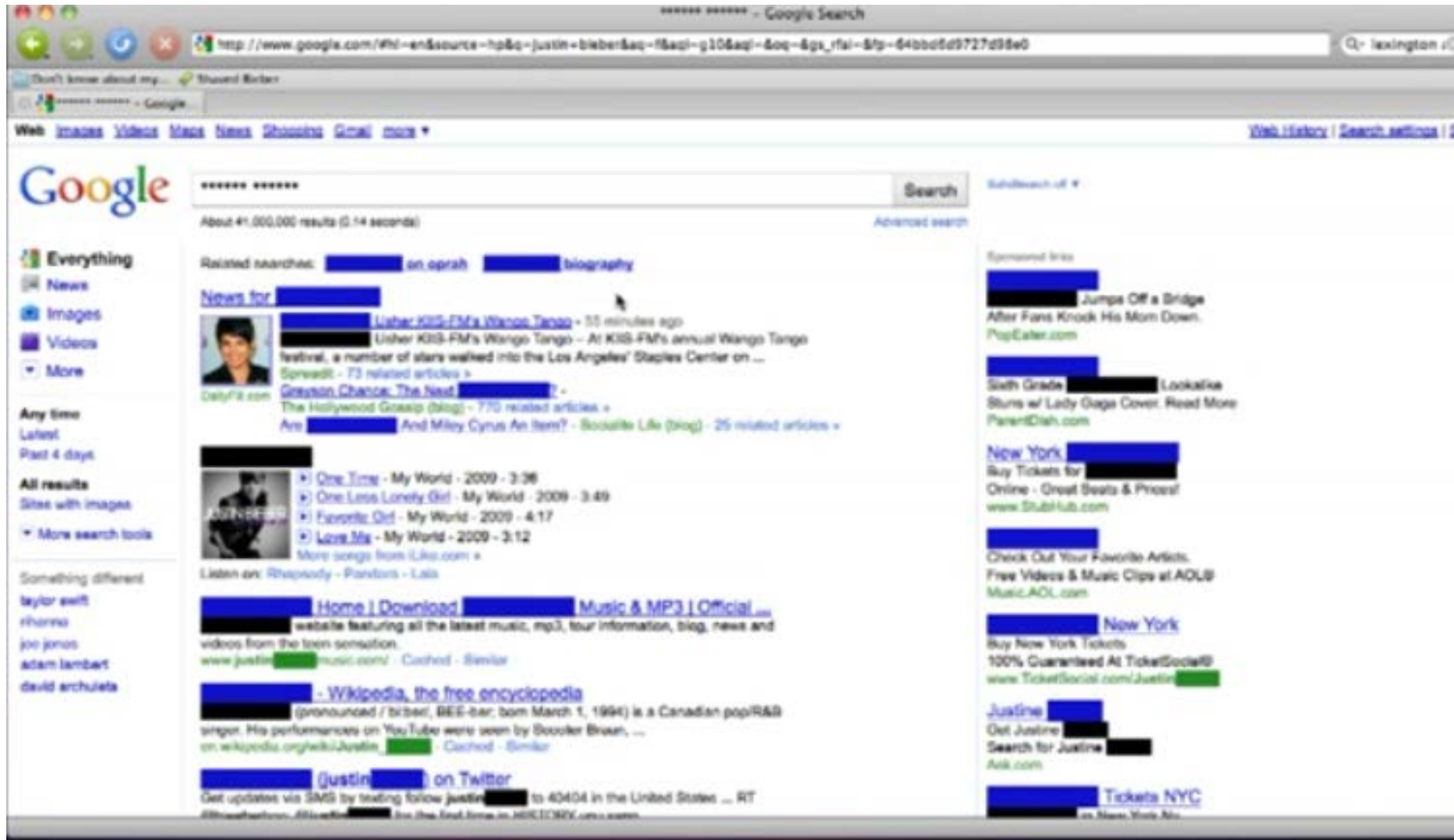
(time of forecast download)

top speed: 31.2 mph

average: 9.0 mph



<http://hint.fm/wind/>



<http://fffff.at/shaved-bieber/>



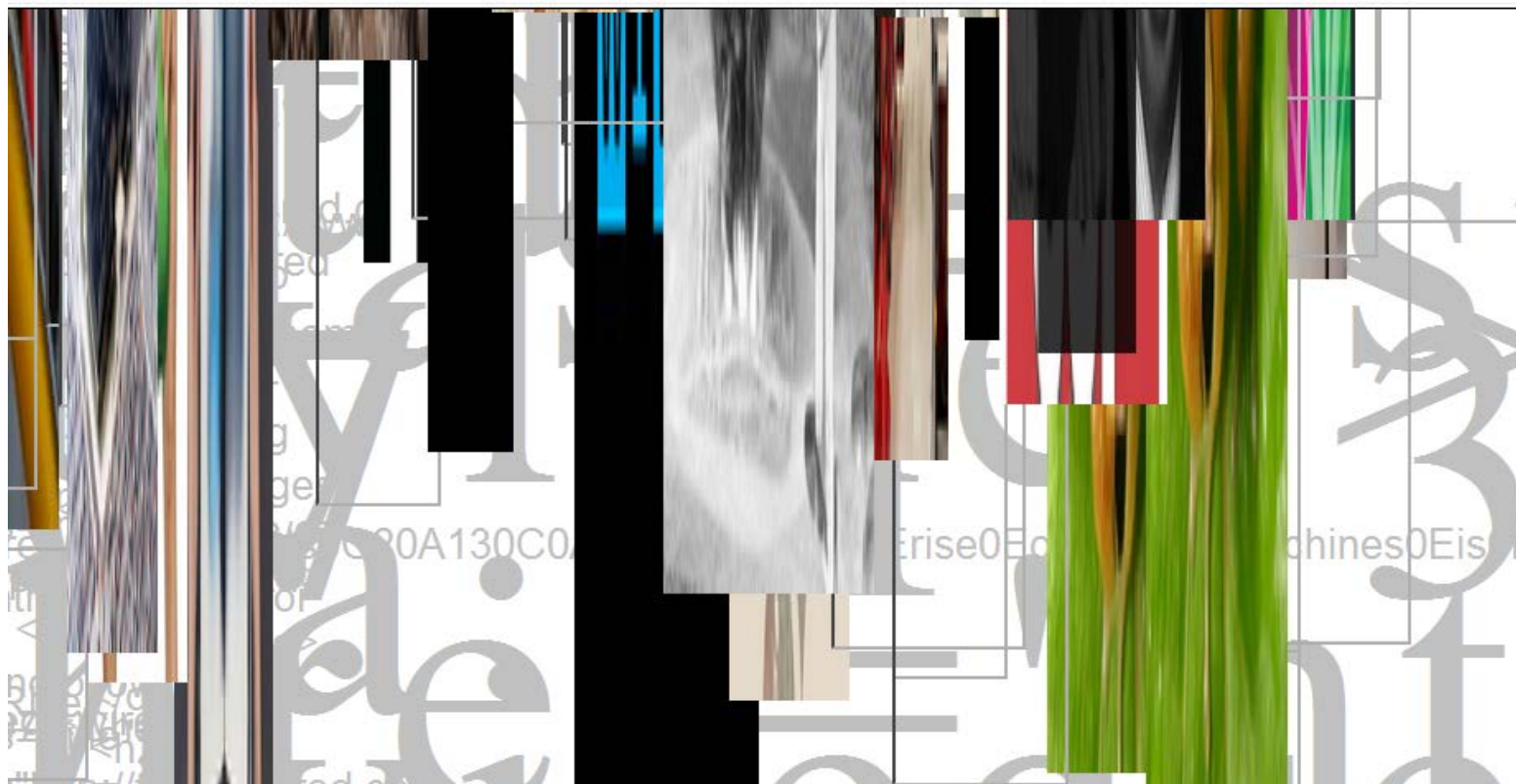


<http://salavon.com/work/color-wheel/image/410/>



Location: wired.com

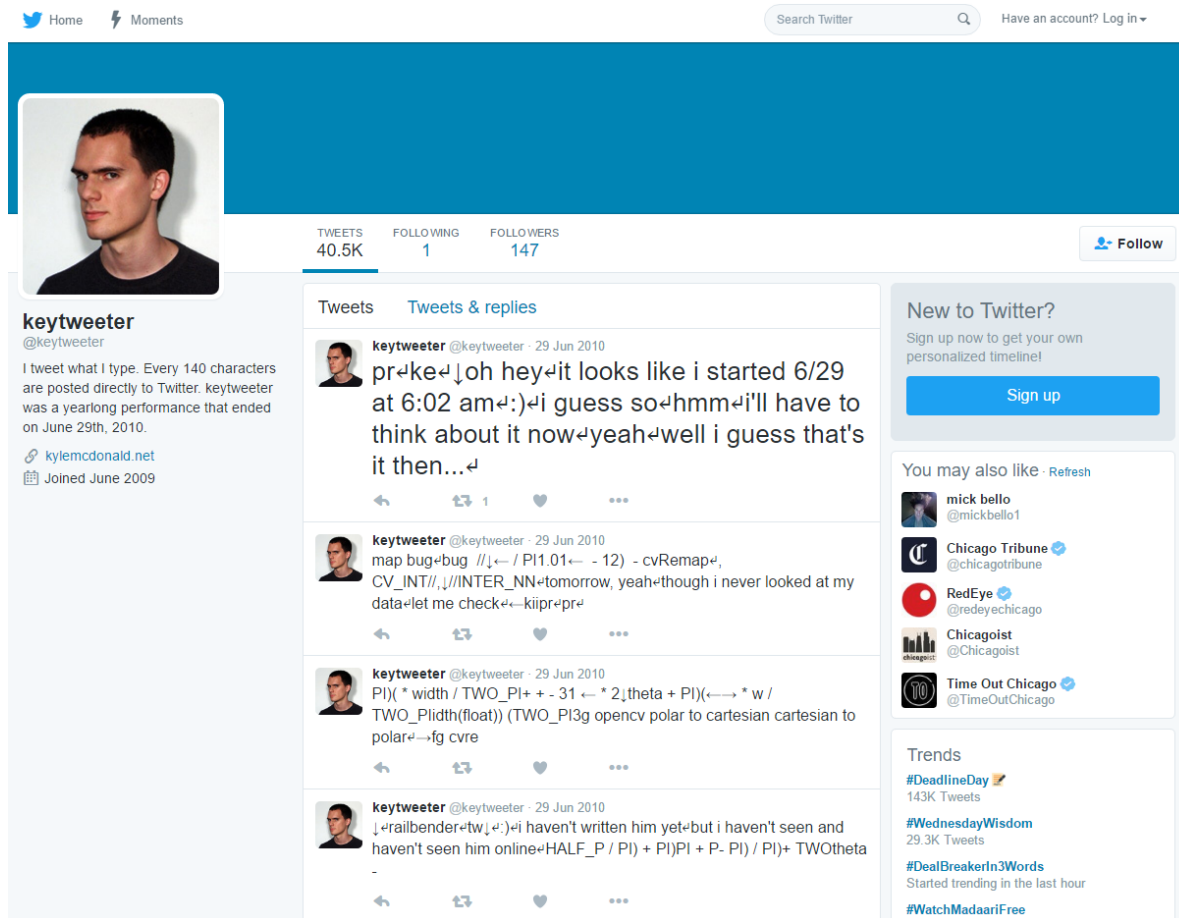
Bookmarks:



Mark Napier - Shredder

<http://www.potatoland.org/shredder/shredder.html>





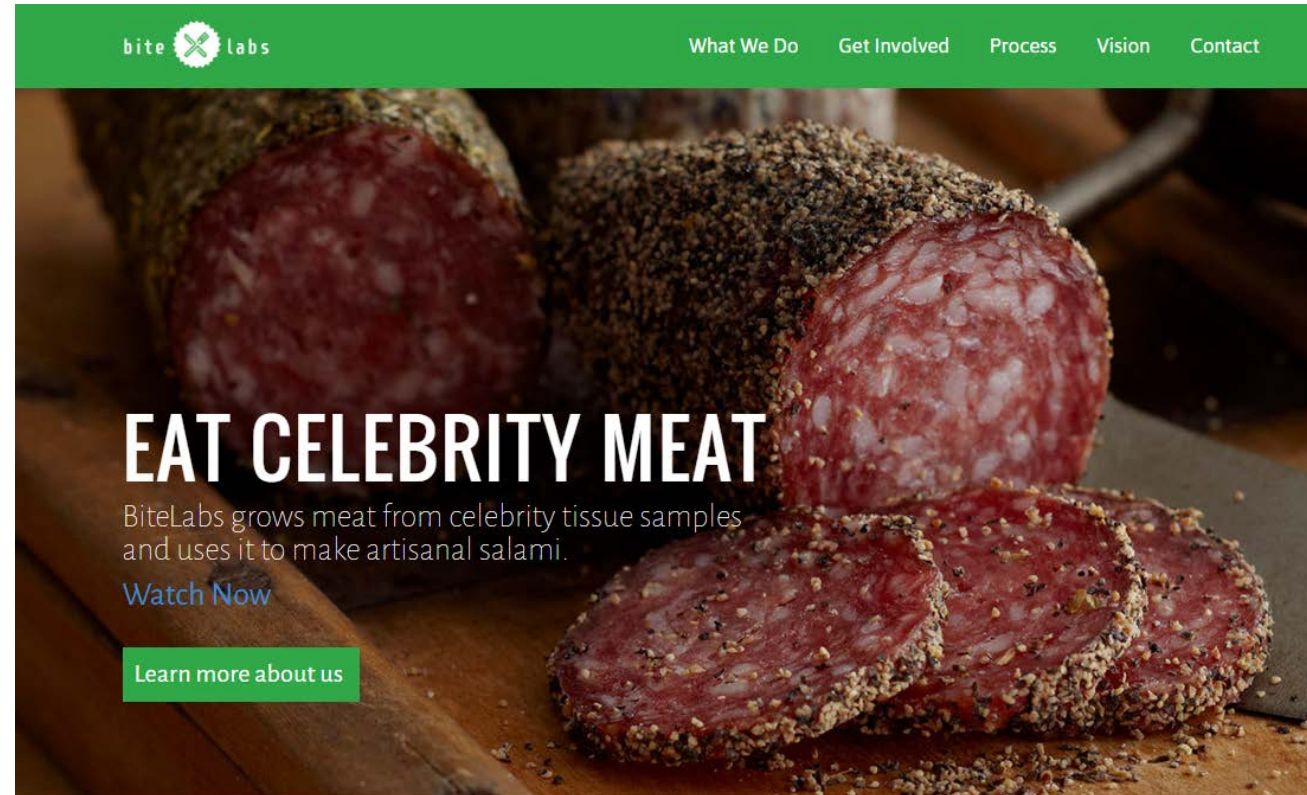
KeyTweeter  
[Twitter](#)



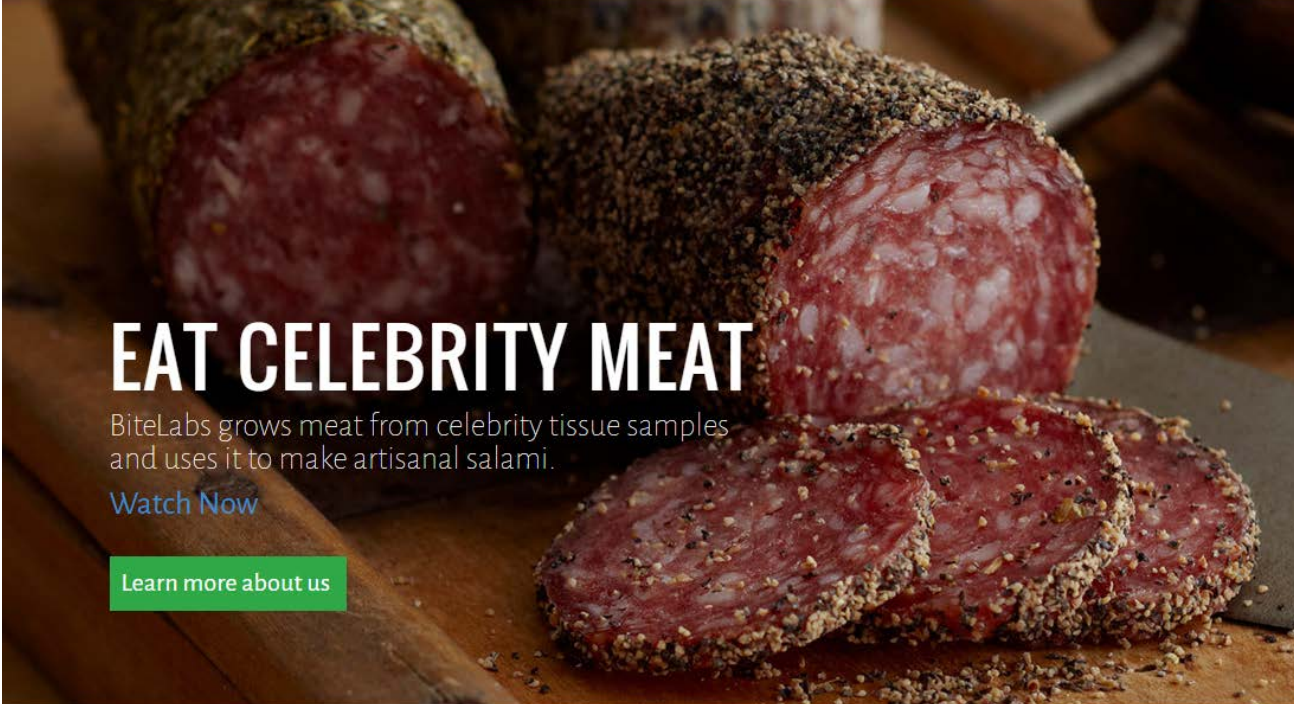
256 Important Things  
[Flickr album](#)





bite  labs

What We Do   Get Involved   Process   Vision   Contact



# EAT CELEBRITY MEAT

BiteLabs grows meat from celebrity tissue samples and uses it to make artisanal salami.

[Watch Now](#)

[Learn more about us](#)

You've never experienced celebrities like this



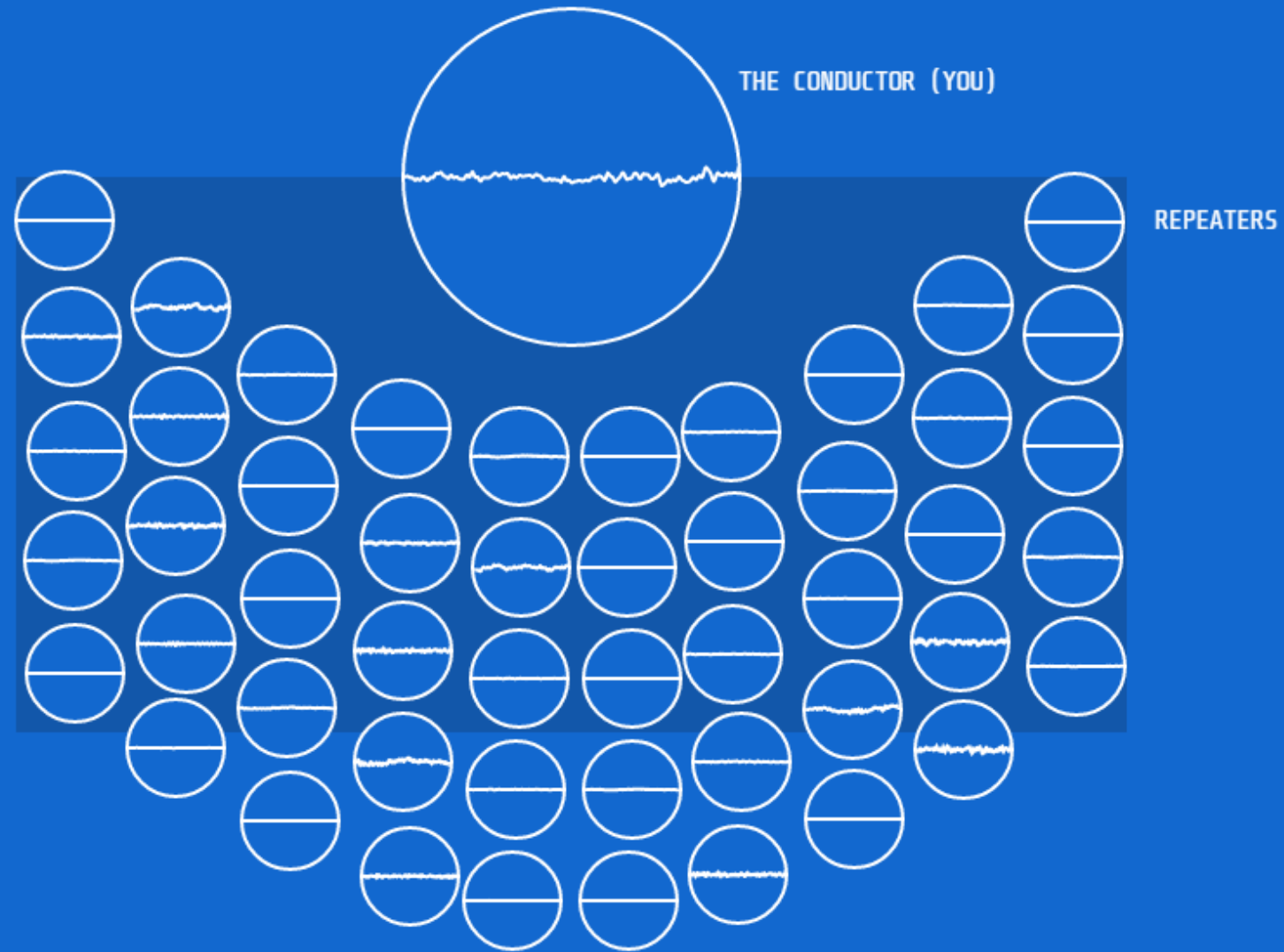
<http://www.bitelabs.org/>



<http://projects.justinblinder.com/Vacated>



# THE REPEATER ORCHESTRA



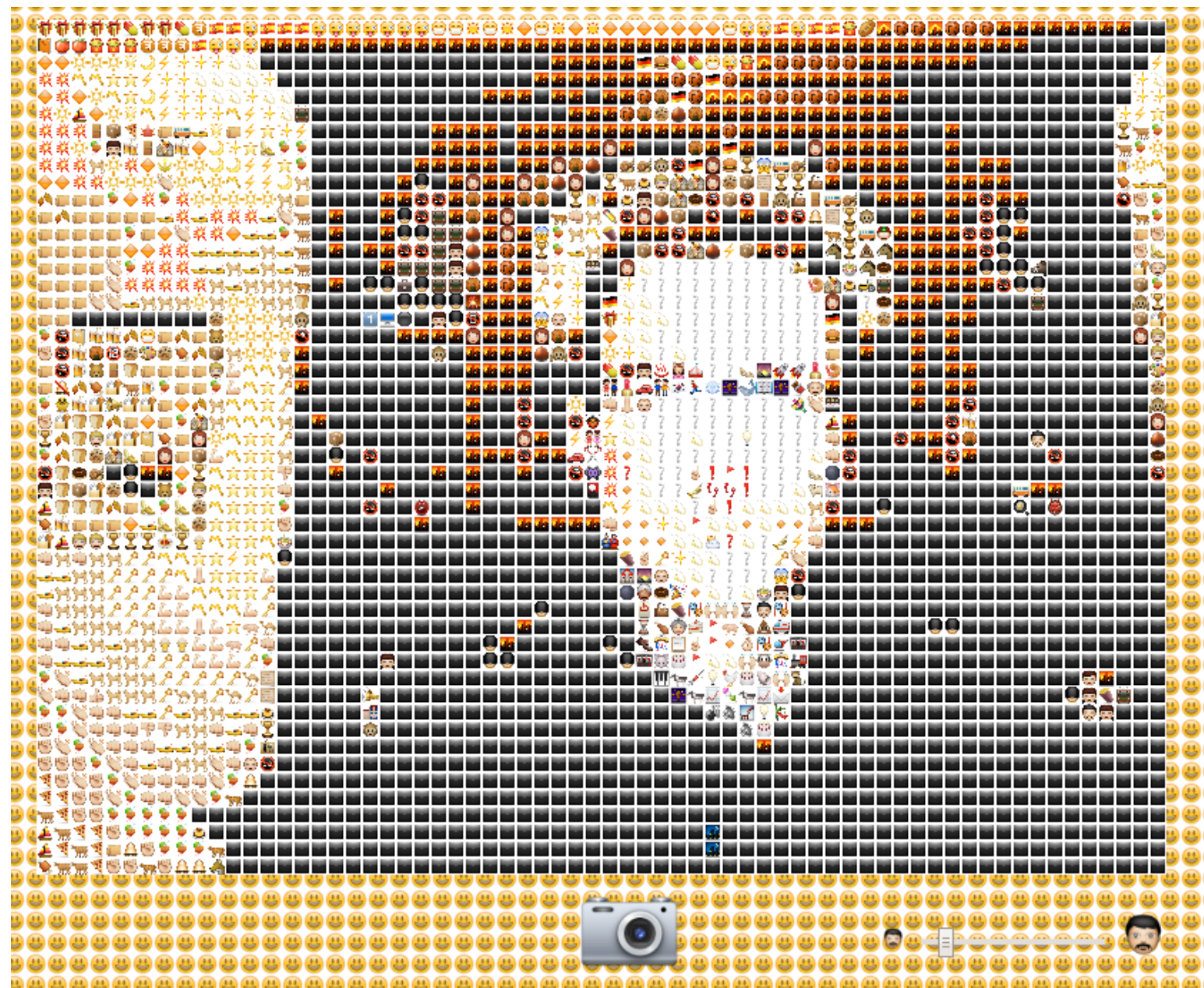
<https://codepen.io/barefootfunk/pen/ZWoLmo>





<https://nithi-p.github.io/finalproject/>





<https://emojibooth.biz>



<http://mrdoob.com/projects/harmony/>

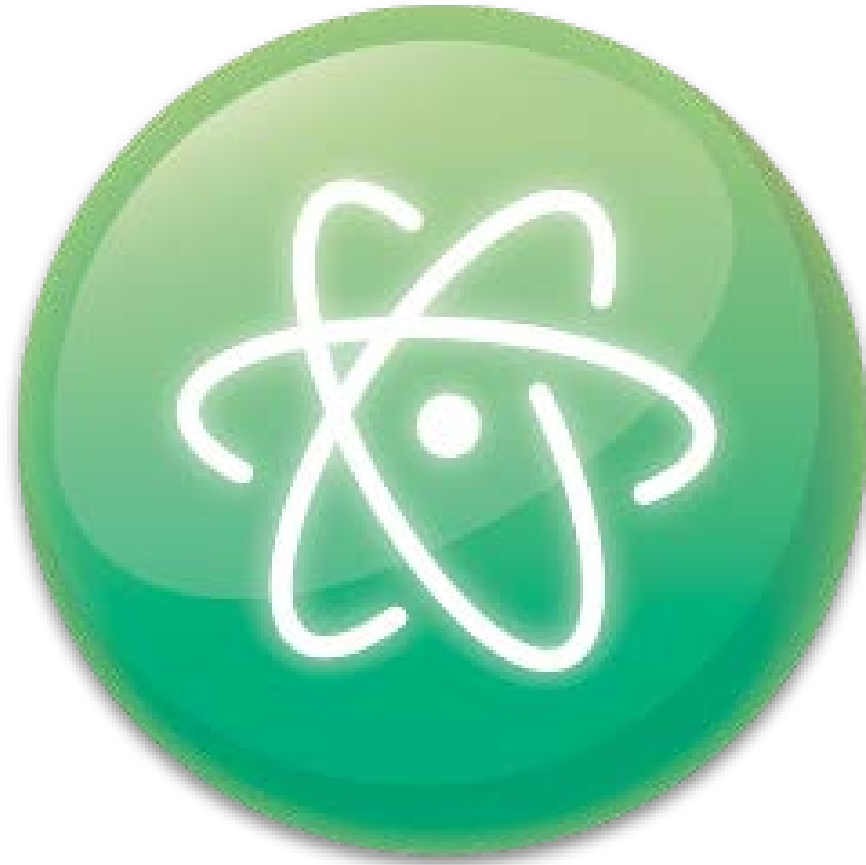
Setup

# Collabedit

- <http://collabedit.com/ewerf>
- Collective notepad for sharing links and code
- Keep a tab open

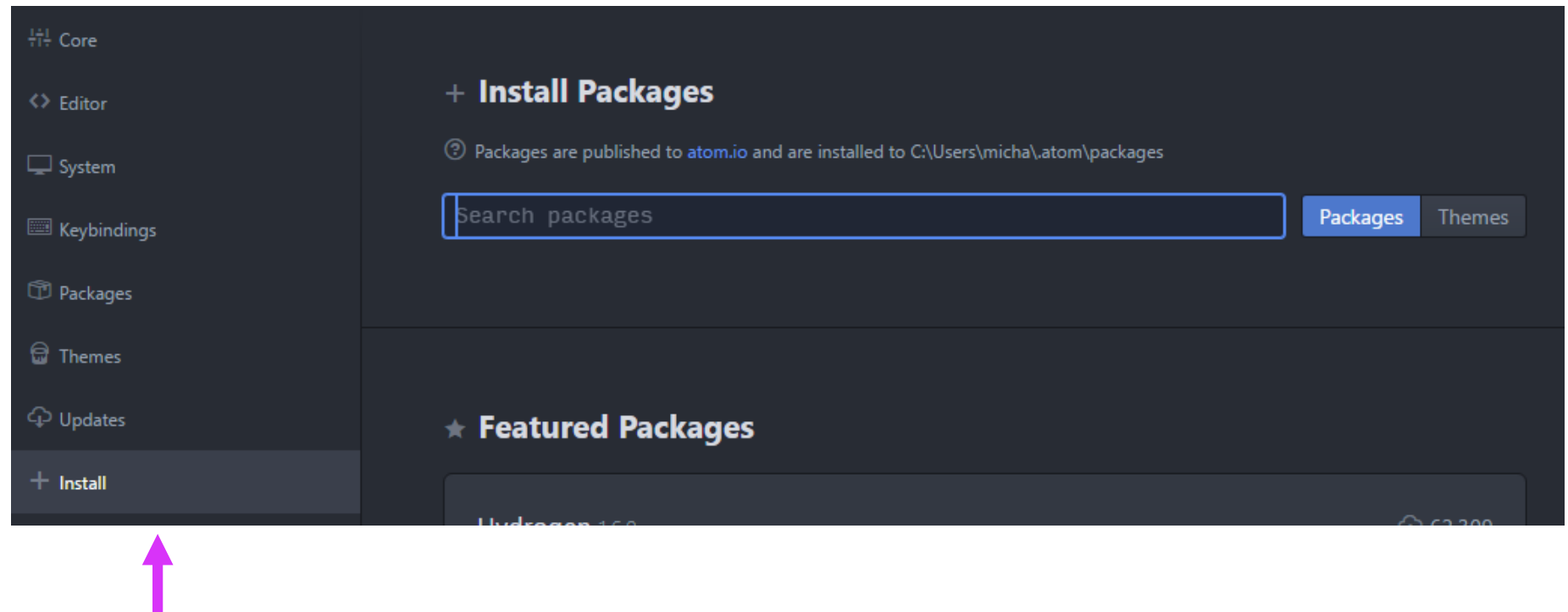
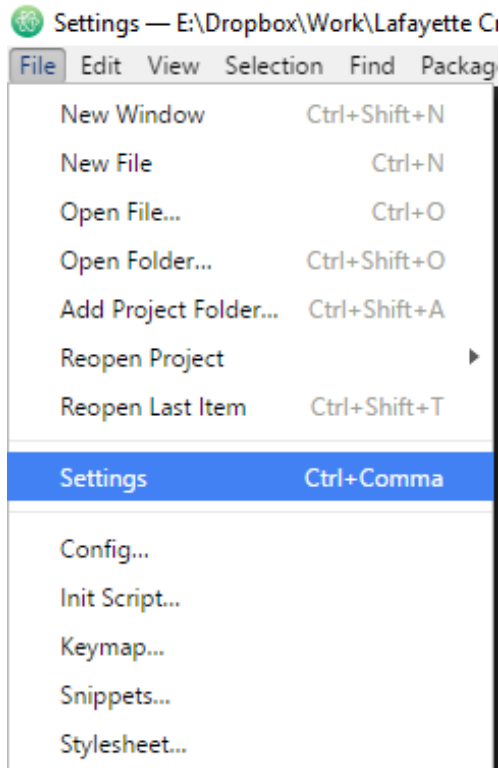


# Atom.io



<https://atom.io/>

# Installing Packages








# Installing Packages


**atom-live-server** 2.1.2

Launch a http server with live reload capability.

 jas-chen


 Uninstall


 Disable


 48,767


**linter-eslint** 8.1.4


Lint JavaScript on the fly, using ESLint

 AtomLinter

 Settings

 Uninstall

 Disable

 658,871

# Alternate Setups

- Openprocessing ([tutorial](#)) – online editor
- Processing 3 IDE ([tutorial](#)) – desktop editor
- Codepen ([tutorial](#)) – online editor



# p5.js

Processing, Reinterpreted for JavaScript



# What is p5?

- <https://p5js.org/>
- Creative coding library for the web
- It provides:
  - An easy way to use HTML5 Canvas
  - Makes life easier for: mouse tracking, colors, events, images, math, shapes, typography, sounds, etc.
  - [Extra libraries](#) for sound, games, geolocation, speech, etc.

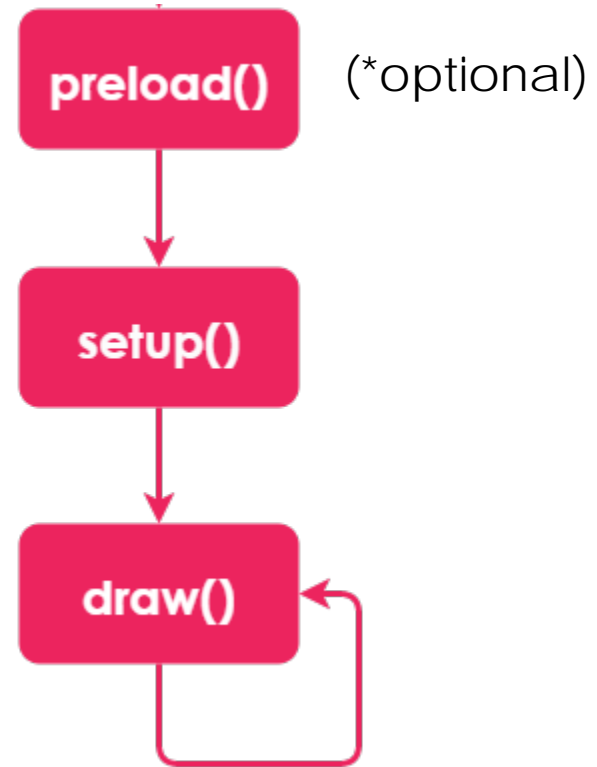


# p5 vs Processing

- p5 is JavaScript, whereas Processing is Java
- A p5 sketch is built around web technologies:
  - Easy to put online
  - Can manipulate the webpage around it
  - Can use web technologies – webcam, speech synthesis, etc.
  - Can integrate other JS libraries – face tracking, geolocation, audio synthesis, etc.
- Generally speaking, p5 will not be as fast as Processing



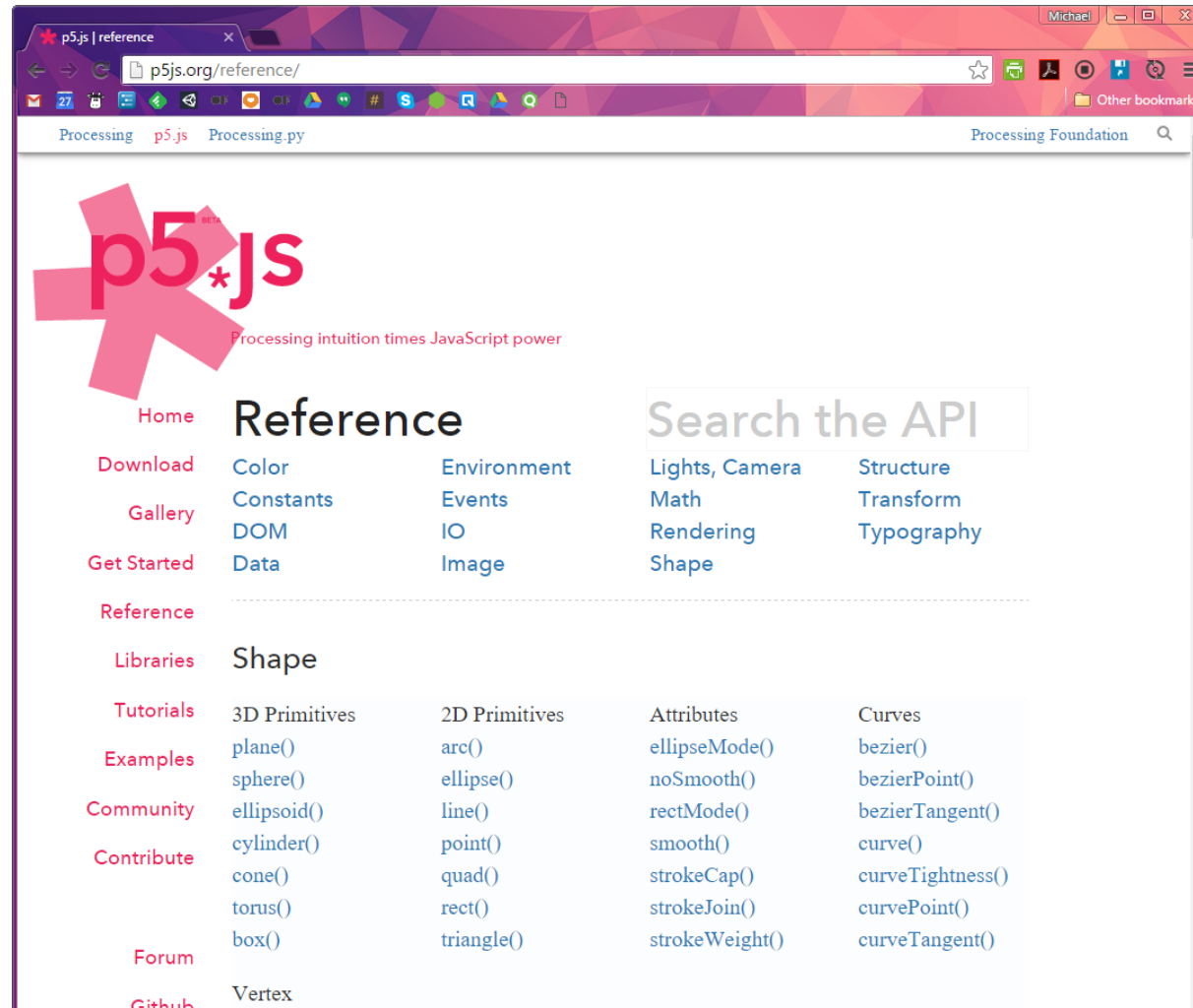
# p5 Structure





# Reference

(keep this tab open)



01-structure



**HTML**

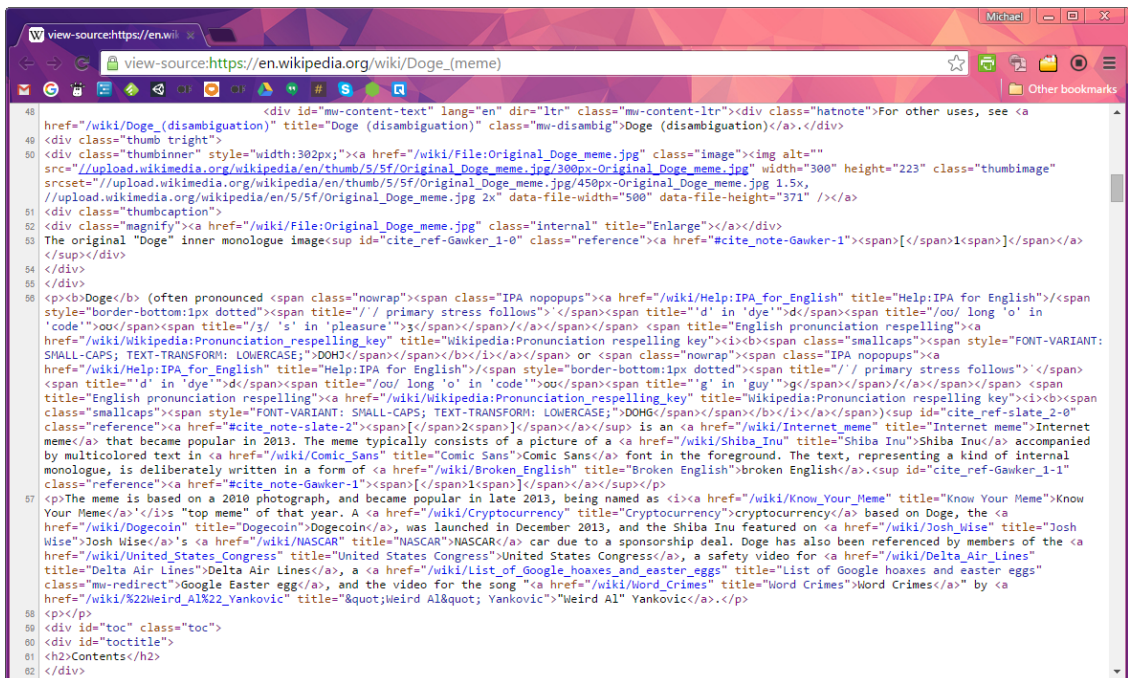


**JS**



**CSS**






# Console & DevTools



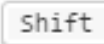






# Accessing DevTools

To access the DevTools, on any web page or app in Google Chrome:

- Open the **Chrome menu**  at the top-right of your browser window, then select **Tools > Developer Tools**.
- Right-click on any page element and select **Inspect Element**.

On the keyboard:

Access DevTools	On Windows	On Mac
Open Developer Tools	 ,  +  + 	 +  + 

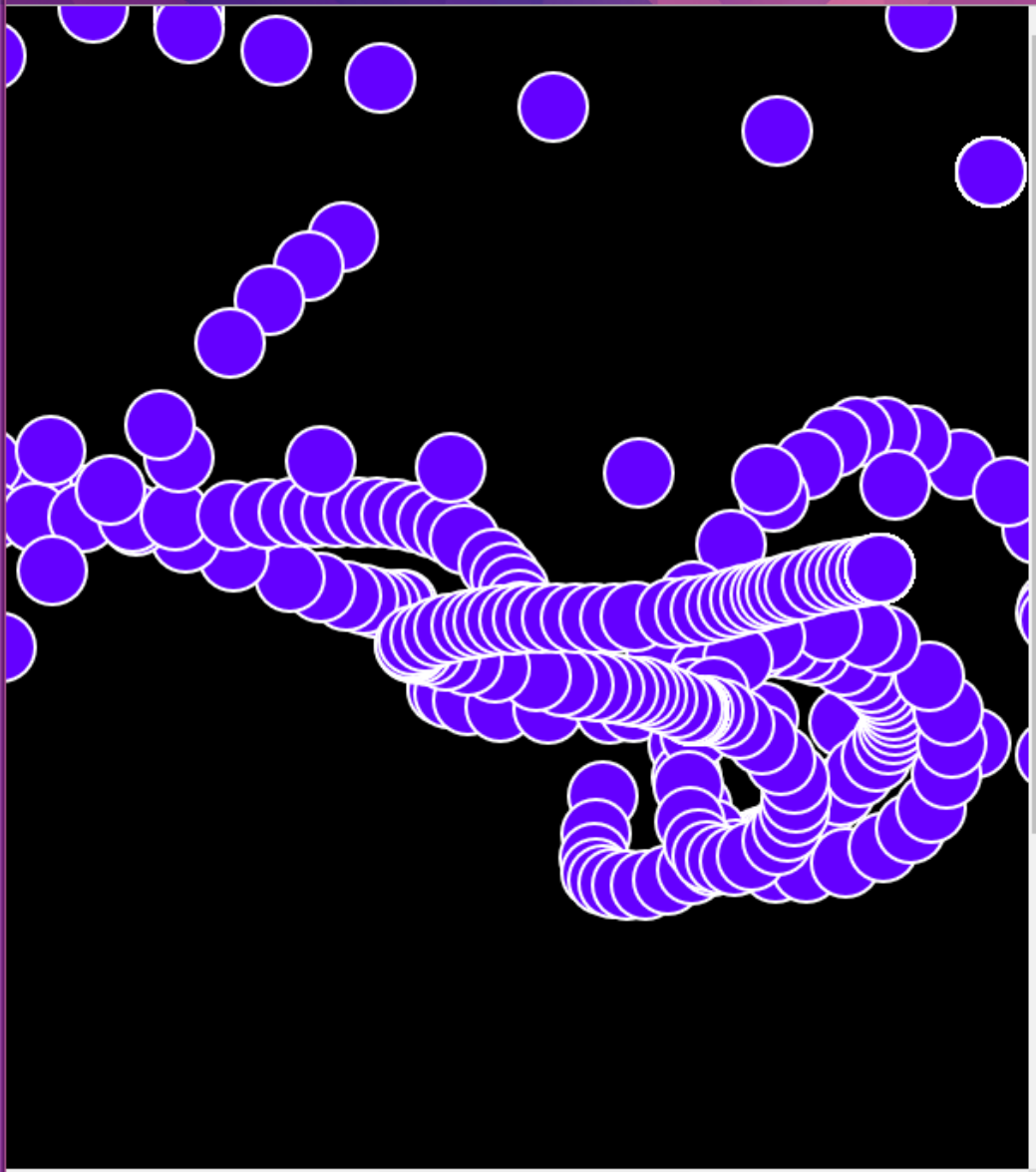




Michael

p5

file:///E:/Dropbox/Work/Lafayette%20Creative%20Coding%20Workshop/AdvancedWorkshop/solutions/01-structure/index



Elements Console Sources Network Timeline Profiles Application

top ☐ Preserve log

Filter Filter ☐ Regex ☐ Hide network ☒ Hide violations


All Errors Warnings Info Logs Debug Handled

> |


Console Rendering


# RGB Color Model


RGB Calculator



`rgb(179, 0, 252)`  
`#b300fc`  
`hsl(283, 100%, 49%)`

R:  

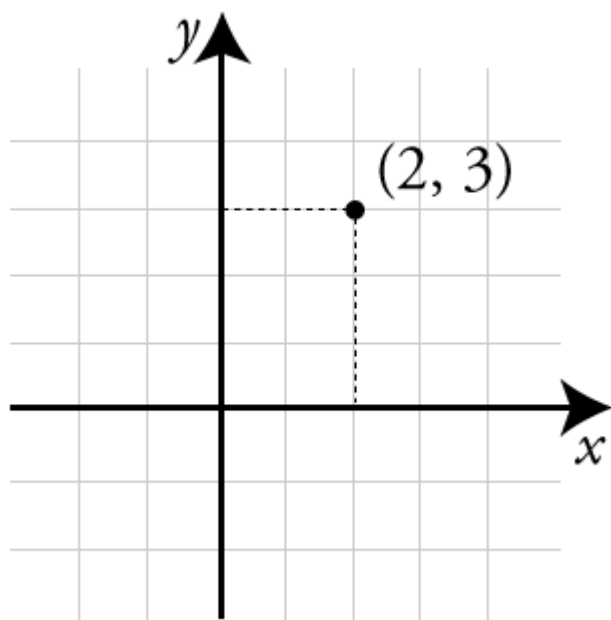
G:  

B:  

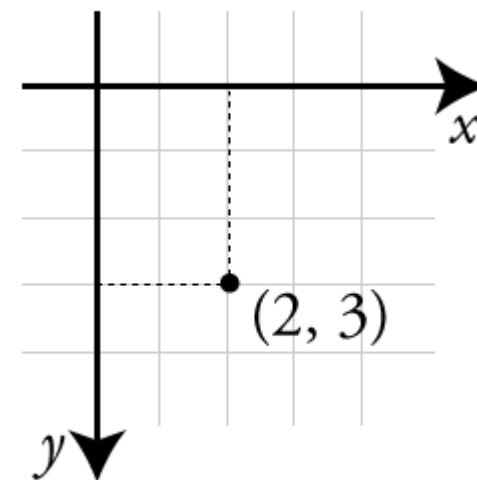
[Use this color in our Color Picker](#)

[https://www.w3schools.com/colors/colors\\_rgb.asp](https://www.w3schools.com/colors/colors_rgb.asp)

# Coordinates



Coordinates in Math



Coordinates in Graphics

“if” Statement



```
if (score >= 50) {  
    console.log("You passed!");  
}
```



CONDITION

```
if (score >= 50) {  
    console.log("You passed!");  
}
```

RESULT

# Comparison Operators

>

>=

<

<=

=== (or ==)

!== (or !=)

# Mouse Conditional in p5

```
if (mouseIsPressed) {  
  if (mouseButton === LEFT) {  
    // Left mouse pressed  
    // ... draw something  
  } else if (mouseButton === RIGHT) {  
    // Right mouse pressed  
    // ... draw something different  
  } else if (mouseButton === CENTER) {  
    // Middle mouse pressed  
    // ... draw something even more different  
  }  
}
```

“If...else if...else” Statement

```
var score = 90;

// "If...else if...else" statement starting

if (score >= 90) {
    console.log("You aced it!");
}
else if (score >= 50) {
    console.log("You passed!");
}
else {
    console.log("You failed!");
}

// If statement over, the script will continue
```



```
var score = 90;
```

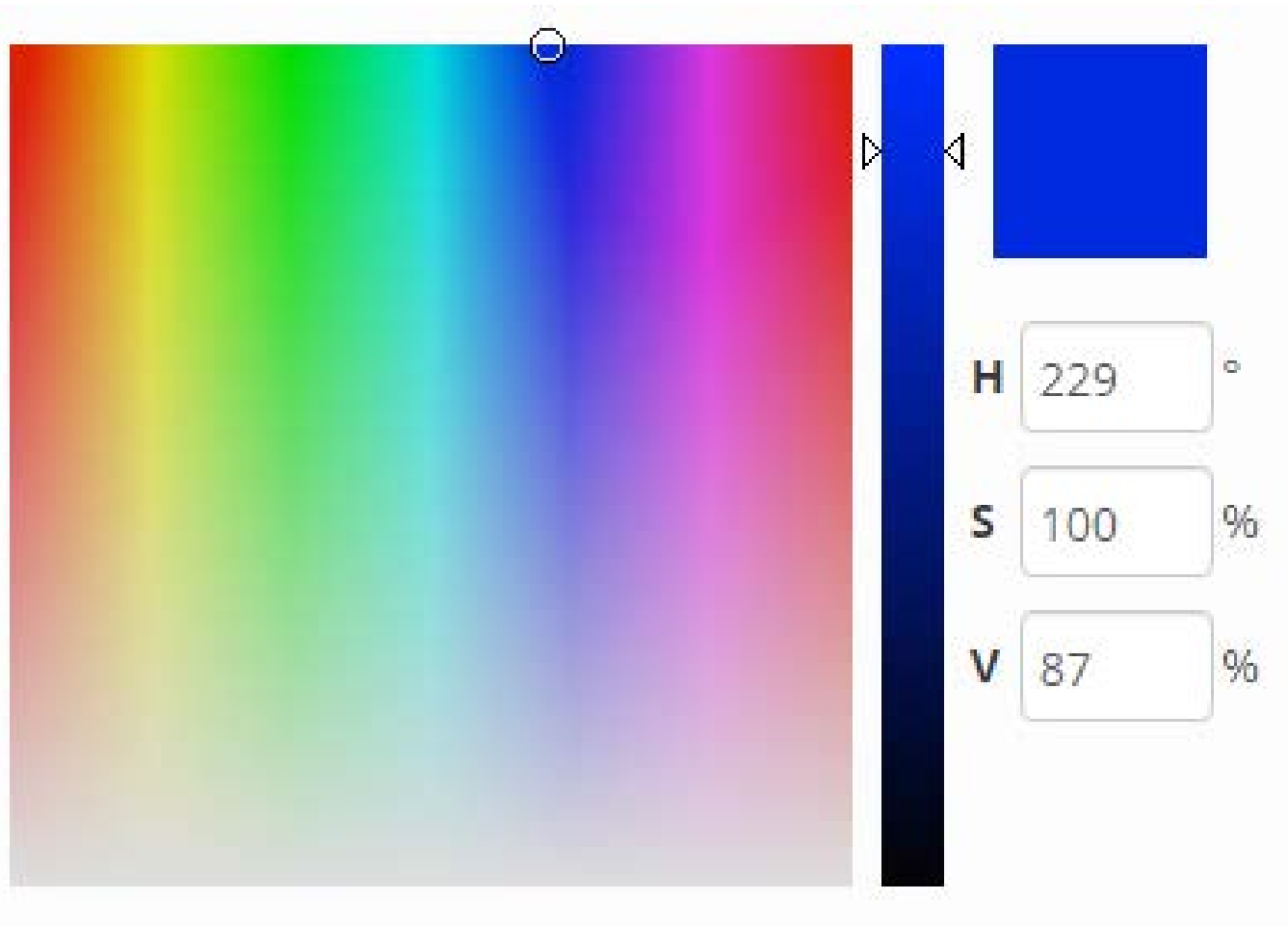
```
// "If...else if...else" statement starting
```

IF STATEMENT	{	<pre>if (score &gt;= 90) {</pre>	}	IF CLAUSE
		<pre>    console.log("You aced it!");</pre>		
		<pre>}</pre>		
		<pre>else if (score &gt;= 50) {</pre>	}	ELSE IF CLAUSE
<pre>    console.log("You passed!");</pre>				
		<pre>else {</pre>	}	ELSE CLAUSE
		<pre>    console.log("You failed!");</pre>		
		<pre>}</pre>		

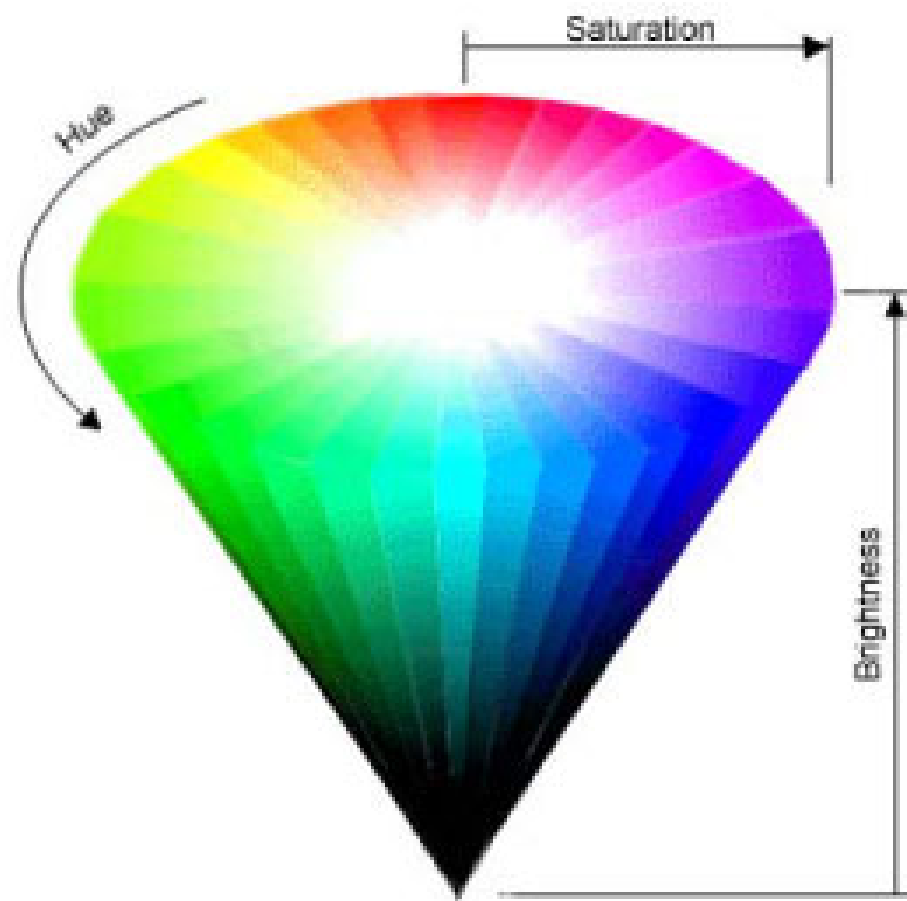
```
// If statement over, the script will continue
```



# HSB Color Model



<http://alloyui.com/examples/color-picker/hsv/>



<http://www.tomjewett.com/colors/hsb.html>

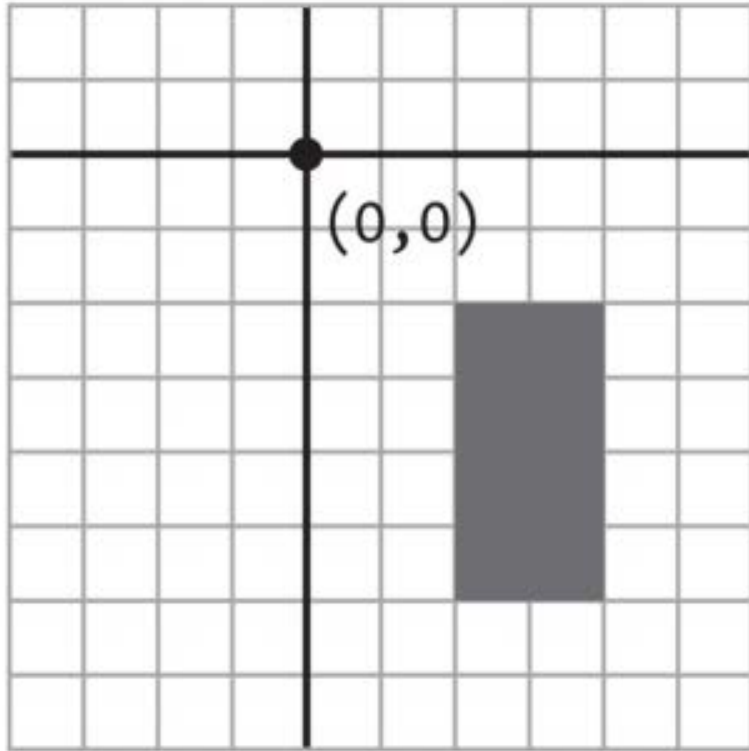
# p5 Transformations



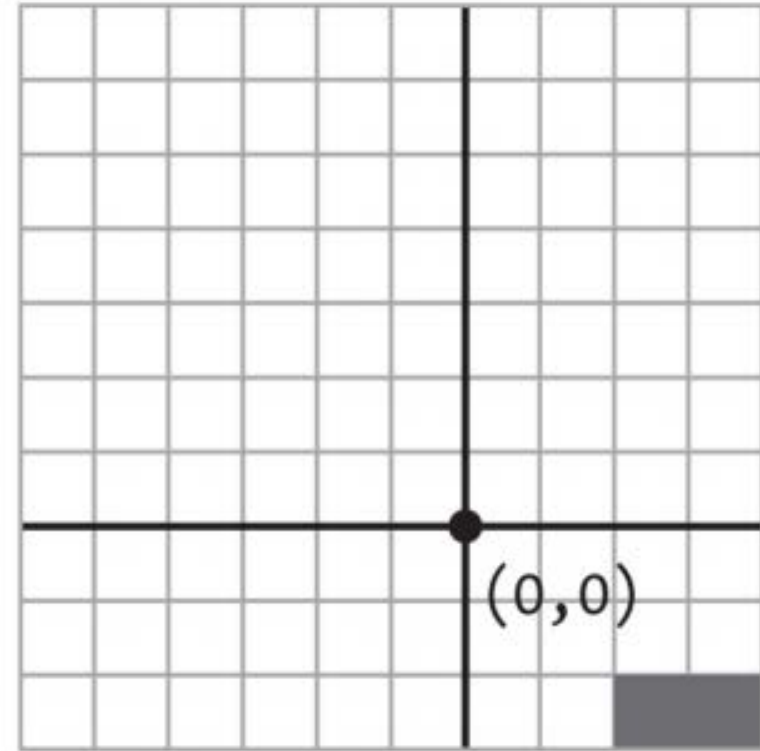
# Translate, Rotate, Scale

- Push and pop - [Reference](#)
- Gene Kogan's Tutorial: [p5.js Transformations](#)
- Allison Parrish's Tutorial: [Transformation and Functions](#)
- Processing Tutorial: [Transform 2D](#)

```
translate(40, 20);  
rect(20, 20, 20, 40);
```

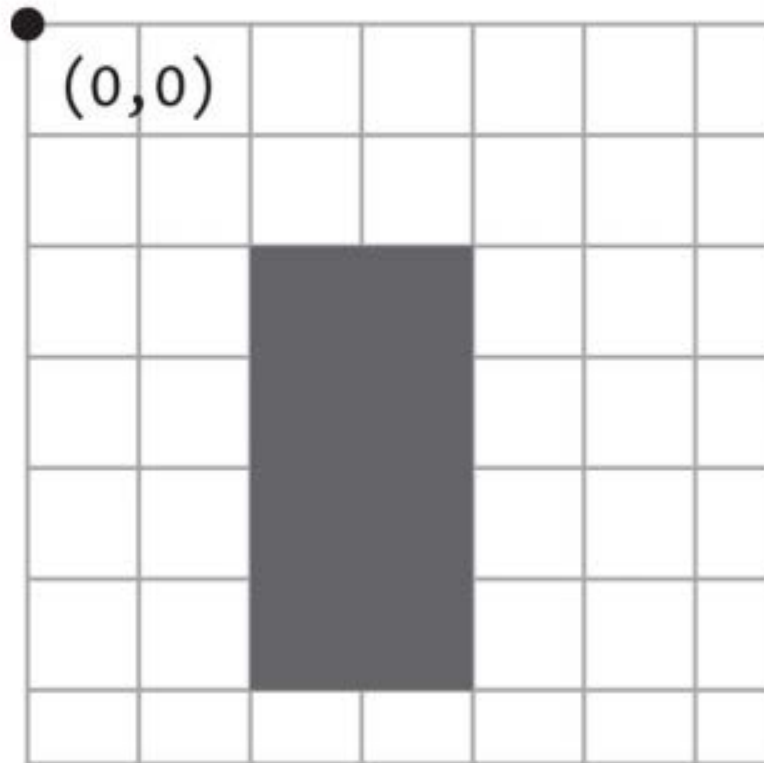


```
translate(60, 70);  
rect(20, 20, 20, 40);
```

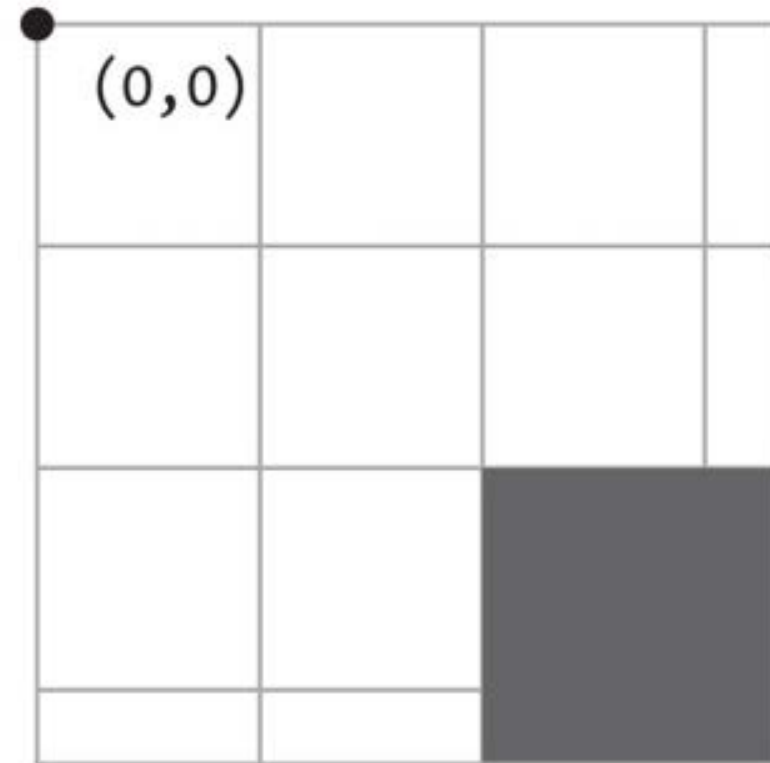


*Figure 6-1. Translating the coordinates*

```
scale(1.5);  
rect(20, 20, 20, 40);
```

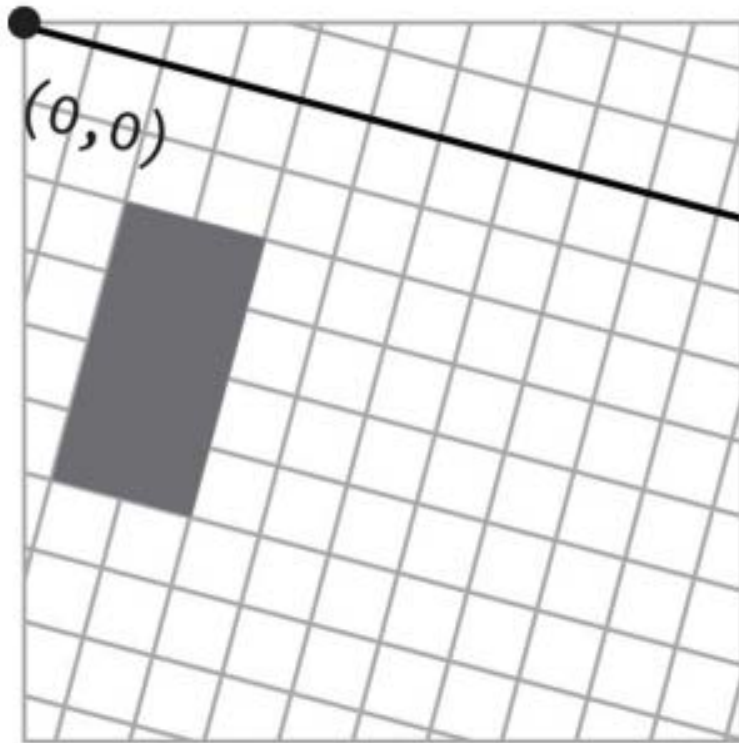


```
scale(3);  
rect(20, 20, 20, 40);
```



*Figure 6-3. Scaling the coordinates*

```
rotate(PI/12.0);  
rect(20, 20, 20, 40);
```



```
rotate(-PI/3);  
rect(20, 20, 20, 40);
```

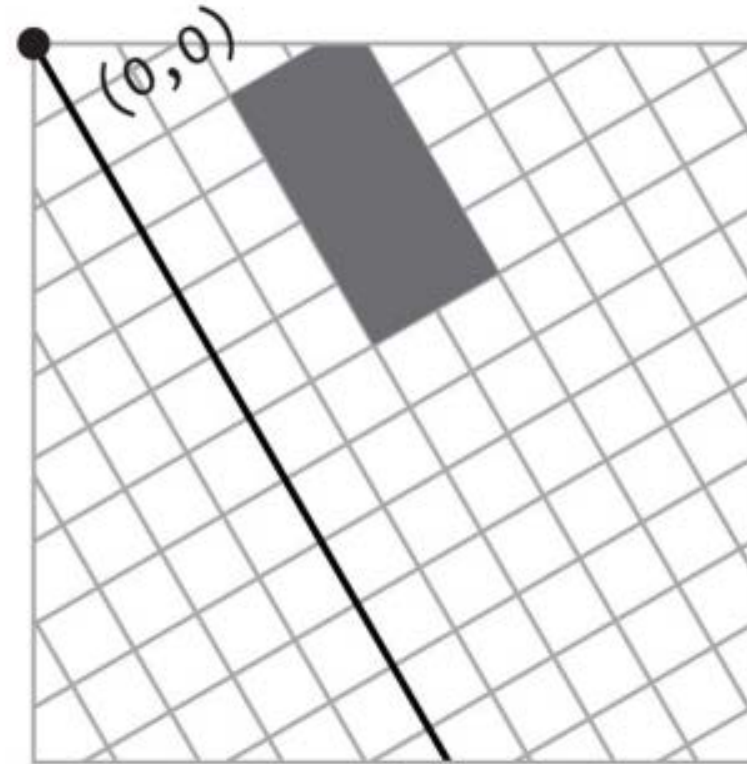


Figure 6-2. Rotating the coordinates





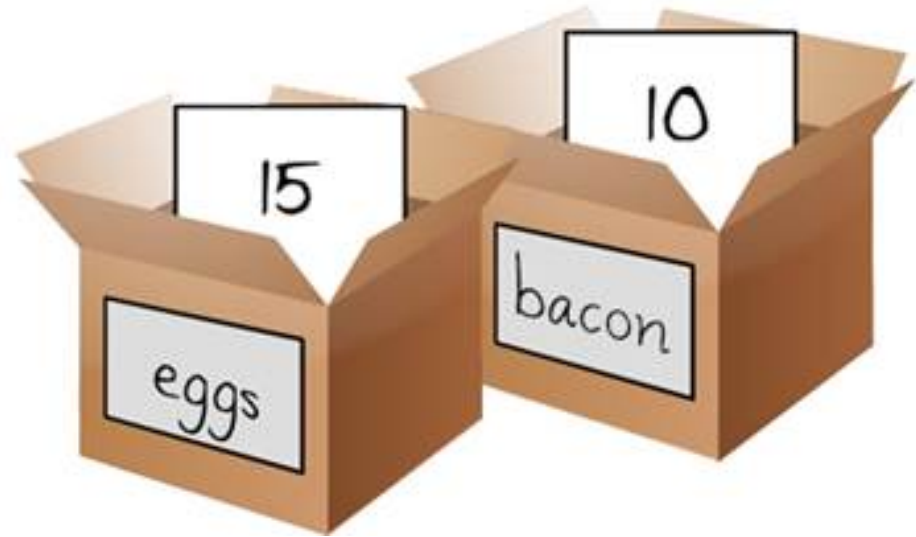
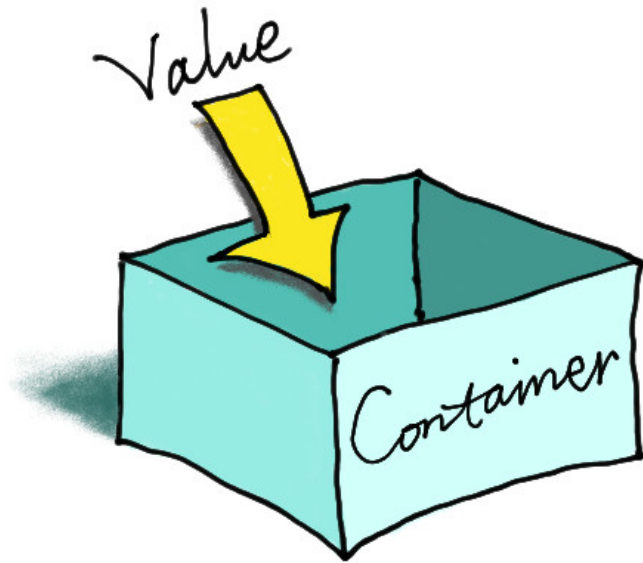
# Rotating in Place

```
rectMode(CENTER);    // Draw rectangles from center
angleMode(DEGREES);  // All angles are now degrees

push();              // Save style/transform
  translate(400, 200); // Move to where you want to draw
  rotate(45);          // Apply desired rotation
  scale(3);            // Apply desired scale
  rect(0, 0, 40, 100);
pop();               // Restore previous style/transform
```



# Variables as Named Boxes



# Variables in JavaScript

```
var highScore = 24;  
var salesTax = 0.9;  
var message = "Hello there.";  
var isSnowing = false;
```



VARIABLE NAME



END

I

*var* message = "Hello sir or madam.";



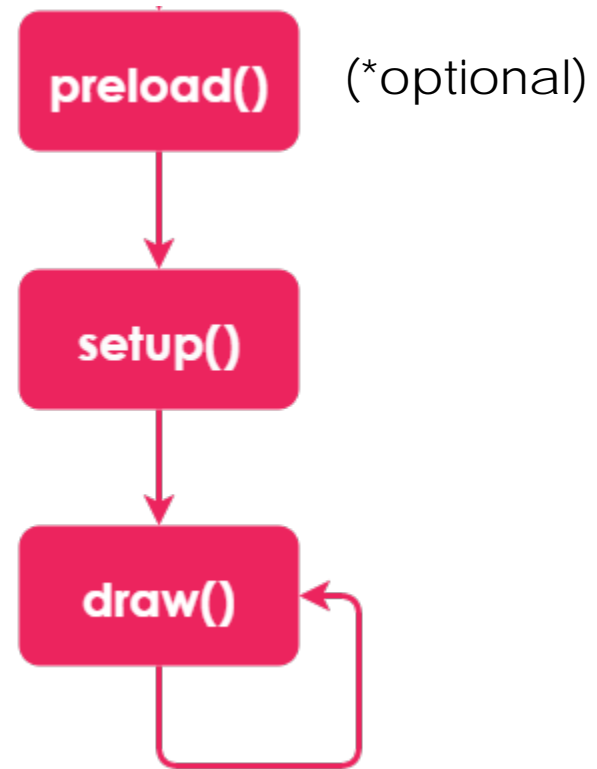
CREATE

VALUE

04-images



# p5 Structure





```
// Global variable
var img;

function preload() {
  // Load the image before the sketch runs
  img = loadImage("images/catball.png");
}

function setup() {
  createCanvas(windowWidth, windowHeight);
}

function draw() {
  // Draw the image at (0, 0) on the canvas
  image(img, 0, 0);
}
```



05-video



# p5.dom

- Documentation: [p5js.org/reference/#/libraries/p5.dom](https://p5js.org/reference/#/libraries/p5.dom)
- Optional library to extend p5
  - Must be included in index.html!
- Allows you to create/manipulate HTML elements
  - Text, hyperlinks, images, inputs, video, audio, webcam...
  - Note: site be served over HTTPS for webcam



# Browser compatibility

Desktop	Mobile				
Feature	Chrome	Firefox (Gecko)	Internet Explorer	Opera	Safari
Basic support	3.0	3.5 (1.9.1)	9.0	10.50	3.1
<audio>: PCM in WAVE	(Yes)	3.5 (1.9.1)	No support	10.50	3.1
<audio>: Vorbis in WebM	(Yes)	4.0 (2.0)	No support	10.60	3.1 <sup>[1]</sup>
<audio>: Streaming Vorbis/Opus in WebM via MSE	?	36.0 (36.0) <sup>[2]</sup>	?	?	?
<audio>: Vorbis in Ogg	(Yes)	3.5 (1.9.1)	No support	10.50	No support
<audio>: MP3	(Yes) <sup>[4]</sup>	(Yes) <sup>[5]</sup>	9.0	(Yes)	3.1
<audio>: MP3 in MP4	?	?	?	?	(Yes)
<audio>: AAC in MP4	(Yes) <sup>[6]</sup>	(Yes) <sup>[7]</sup>	9.0	(Yes)	3.1
<audio>: Opus in Ogg	27.0	15.0 (15.0)	?	?	?
<audio>: FLAC	No support	51 (51)	No support	No support	No support
<audio>: FLAC in Ogg	No support	51 (51)	No support	No support	No support
<video>: VP8 and Vorbis in WebM	6.0	4.0 (2.0)	9.0 <sup>[8]</sup>	10.60	3.1 <sup>[9]</sup>
<video>: VP9 and Opus in WebM	29.0	28.0 (28.0)	?	(Yes)	?
<video>: Streaming WebM via MSE	?	42.0 (42.0) <sup>[35]</sup>	?	?	?
<video>: Theora and Vorbis in Ogg	(Yes)	3.5 (1.9.1)	No support	10.50	No support
<video>: H.264 and MP3 in MP4	(Yes) <sup>[4]</sup>	(Yes) <sup>[10]</sup>	9.0	(Yes)	(Yes)
<video>: H.264 and AAC in MP4	(Yes) <sup>[4]</sup>	(Yes) <sup>[11]</sup>	9.0	(Yes)	3.1
any other format	No support	No support	No support	No support	3.1 <sup>[12]</sup>

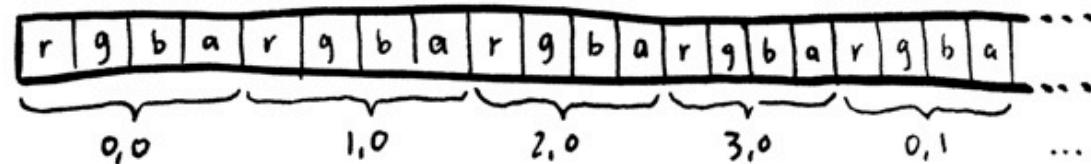


[MDN Reference](#)

how you likely  
conceptualize  
pixels

	0	1	2	3	→ x
0	rg ba	rg ba	rg ba	rg ba	
1	rg ba	rg ba	rg ba	rg ba	
2	rg ba	rg ba	rg ba	rg ba	
3	rg ba	rg ba	rg ba	rg ba	
↓ y					

how the .pixels  
array works



06-audio



# p5.sound

- Documentation: [p5js.org/reference/#/libraries/p5.sound](https://p5js.org/reference/#/libraries/p5.sound)
- Optional sound library to extend p5
  - Must be included in index.html!
- Built around the [Web Audio API](#) in JavaScript



# Browser compatibility

	Desktop	Mobile			
Feature	Chrome	Firefox (Gecko)	Internet Explorer	Opera	Safari
Basic support	3.0	3.5 (1.9.1)	9.0	10.50	3.1
<audio>: PCM in WAVE	(Yes)	3.5 (1.9.1)	No support	10.50	3.1
<audio>: Vorbis in WebM	(Yes)	4.0 (2.0)	No support	10.60	3.1[1]
<audio>: Streaming Vorbis/Opus in WebM via MSE	?	36.0 (36.0)[2]	?	?	?
<audio>: Vorbis in Ogg	(Yes)	3.5 (1.9.1)	No support	10.50	No support
<audio>: MP3	(Yes)[4]	(Yes)[5]	9.0	(Yes)	3.1
<audio>: MP3 in MP4	?	?	?	?	(Yes)
<audio>: AAC in MP4	(Yes)[6]	(Yes)[7]	9.0	(Yes)	3.1
<audio>: Opus in Ogg	27.0	15.0 (15.0)	?	?	?
<audio>: FLAC	No support	51 (51)	No support	No support	No support
<audio>: FLAC in Ogg	No support	51 (51)	No support	No support	No support
<video>: VP8 and Vorbis in WebM	6.0	4.0 (2.0)	9.0[8]	10.60	3.1[9]
<video>: VP9 and Opus in WebM	29.0	28.0 (28.0)	?	(Yes)	?
<video>: Streaming WebM via MSE	?	42.0 (42.0)[35]	?	?	?
<video>: Theora and Vorbis in Ogg	(Yes)	3.5 (1.9.1)	No support	10.50	No support
<video>: H.264 and MP3 in MP4	(Yes)[4]	(Yes)[10]	9.0	(Yes)	(Yes)
<video>: H.264 and AAC in MP4	(Yes)[4]	(Yes)[11]	9.0	(Yes)	3.1
any other format	No support	No support	No support	No support	3.1[12]

[MDN Reference](#)



# Playing an Audio File

```
// Global variable
var musicTrack;

function preload() {
    // Load the sound file (mp3 format is your best bet)
    musicTrack = loadSound("audio/baths-aminals.mp3");
}

function setup() {
    createCanvas(windowWidth, windowHeight);
    // Start playing the audio file
    musicTrack.play();
}
```



# Getting the Volume

```
var musicTrack;  
var amplitude;  
  
function preload() {  
  musicTrack = loadSound("audio/baths-animals.mp3");  
}  
  
function setup() {  
  createCanvas(windowWidth, windowHeight);  
  background(0);  
  
  // Start the music playing  
  musicTrack.play();  
  // Get the amplitude of all p5 sounds  
  amplitude = new p5.Amplitude();  
}  
  
function draw() {  
  // Get the volume of the sounds at this moment  
  var level = amplitude.getLevel(); // Number between 0 and 1  
}
```

# Additional Resources

# Need Help?

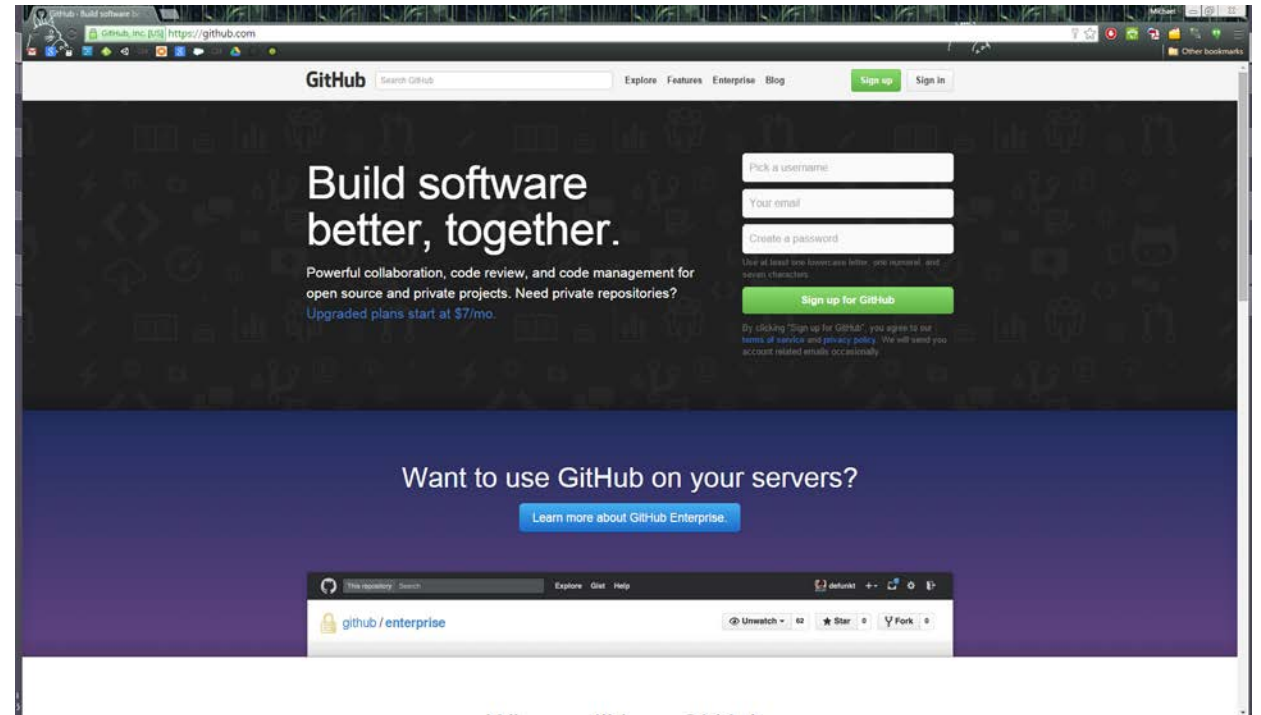
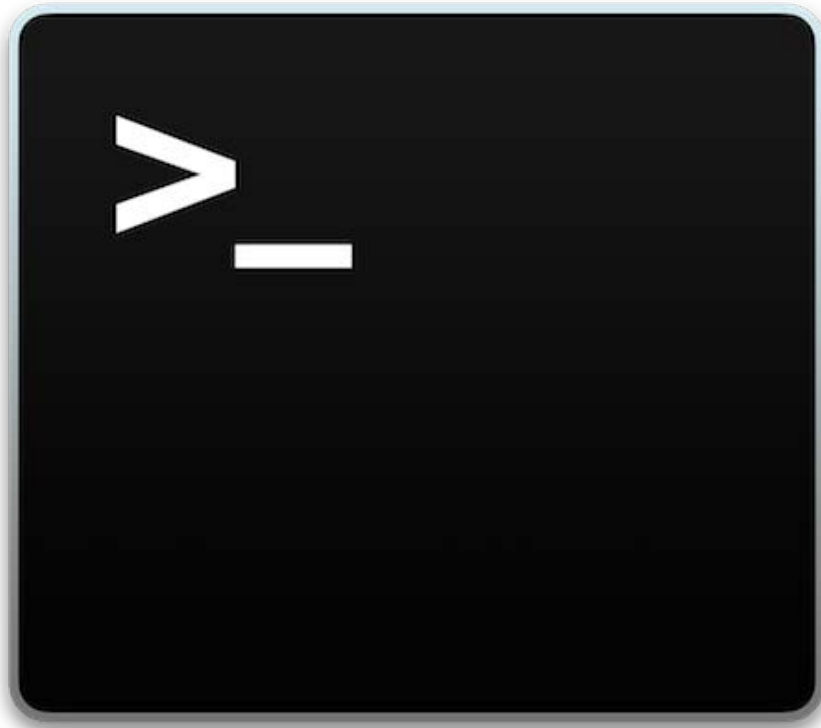
- Dan Shiffman's [video tutorials](#)
- Getting Started with p5.js [book](#)
- Kadenze [online course](#) on p5
- Email me ([mikewesthad@gmail.com](mailto:mikewesthad@gmail.com))
- p5 [tutorials](#)
- p5 [reference](#) page
- p5 forums: [general](#), [programming](#), [libraries](#)
- Online [materials](#) from p5 courses
  - [RISD – p5.js Code As Medium](#) – lots of examples
  - [Visualizing Music with p5.js](#) – slides & examples



# GitHub Pages

“Free” Web Hosting

# Git vs GitHub



# First Time Setup

- Sign up for a GitHub account
- Pick a reasonable account name
  - It will be a part of your website URL
- Make sure to verify your email on your account!
  - Hosting won't work otherwise.



# Creating a “Repository”

# Git Repository

(a folder with a history)



7/15/15 at 10:30p  
First draft of website



7/16/15 at 11:30p  
Fixed IE bug



7/17/15 at 12:00a  
Public release!



7/17/15 at 12:05a  
Everything broke...  
Hopefully this fixes it?

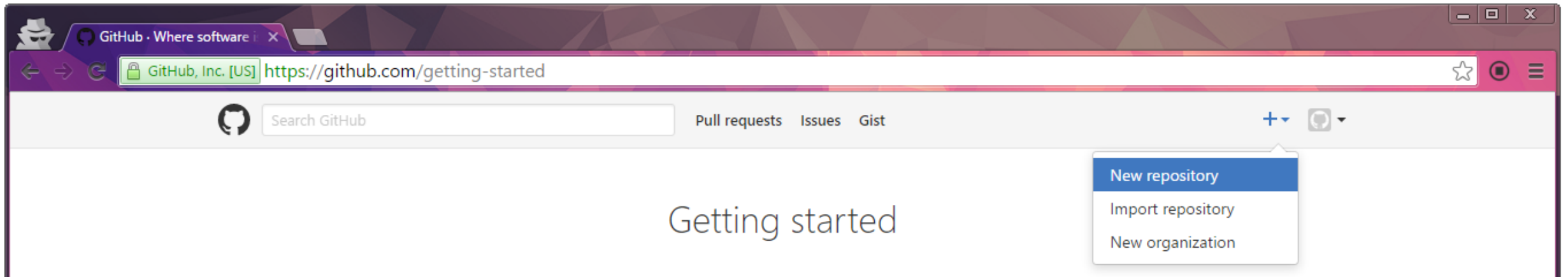




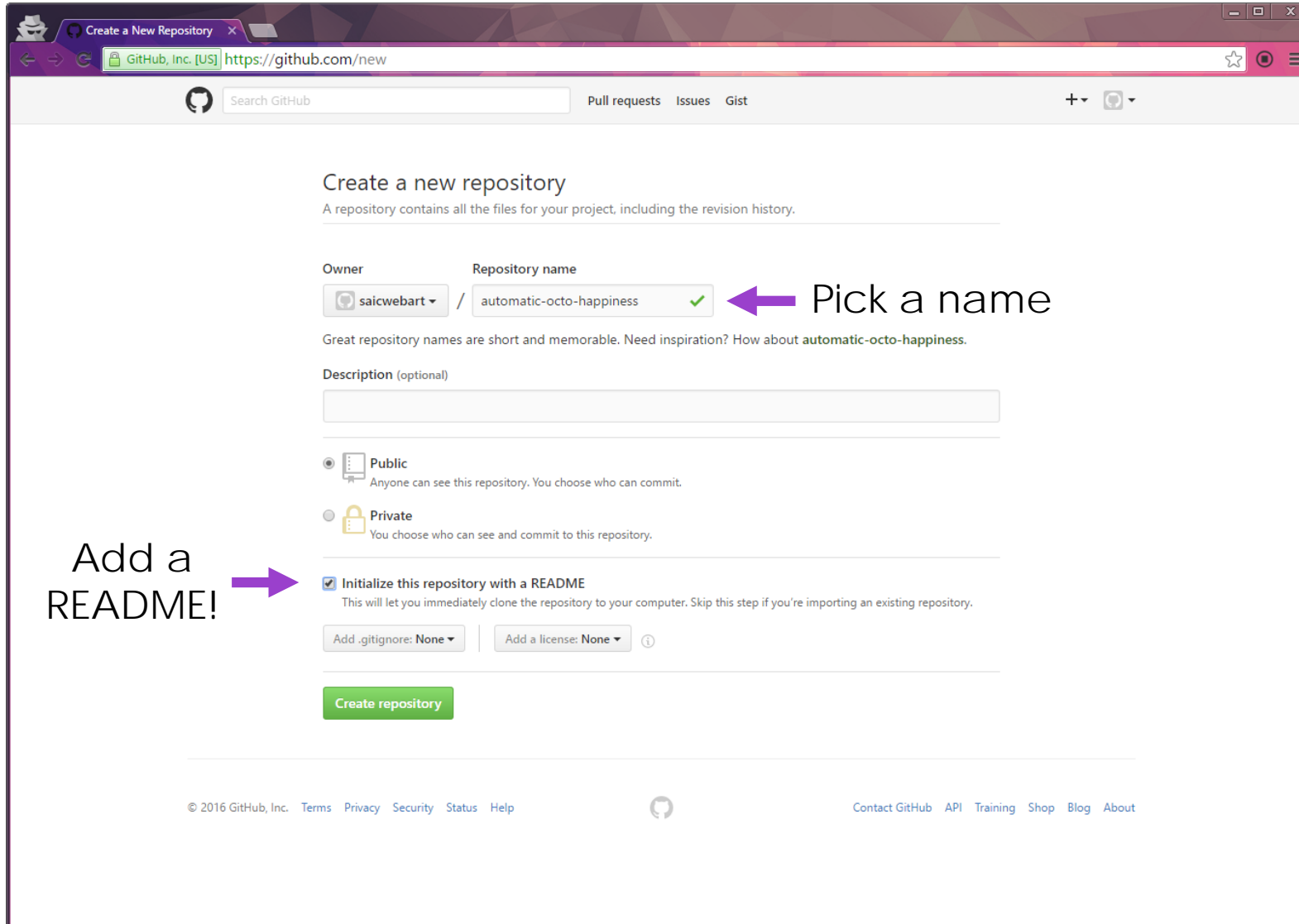
# Default Project URL

[http://\*\*username.github.io/repository\*\*](http://username.github.io/repository)

# Create New Repository on GitHub



# Create New Repository on GitHub



The screenshot shows the GitHub 'Create a New Repository' page. The browser address bar shows 'https://github.com/new'. The page title is 'Create a new repository'. Below the title, it says 'A repository contains all the files for your project, including the revision history.' The form has two main sections: 'Owner' and 'Repository name'. The 'Owner' dropdown is set to 'saicwebart'. The 'Repository name' dropdown is set to 'automatic-octo-happiness' with a green checkmark. A purple arrow points to this dropdown with the text 'Pick a name'. Below this, there is a text input field for 'Description (optional)'. The 'Public' radio button is selected, with the text 'Anyone can see this repository. You choose who can commit.' Below that, the 'Private' radio button is unselected, with the text 'You choose who can see and commit to this repository.' The 'Initialize this repository with a README' checkbox is checked. A purple arrow points to this checkbox with the text 'Add a README!'. Below the checkbox, there are two dropdown menus: 'Add .gitignore: None' and 'Add a license: None'. At the bottom of the form is a green 'Create repository' button. The footer of the page includes copyright information, links to Terms, Privacy, Security, Status, and Help, and links to Contact GitHub, API, Training, Shop, Blog, and About.

Create a new repository

A repository contains all the files for your project, including the revision history.

Owner: saicwebart / Repository name: automatic-octo-happiness ✓ ← Pick a name

Great repository names are short and memorable. Need inspiration? How about automatic-octo-happiness.

Description (optional)

☒ Public  
Anyone can see this repository. You choose who can commit.

☐ Private  
You choose who can see and commit to this repository.

☒ Initialize this repository with a README  
This will let you immediately clone the repository to your computer. Skip this step if you're importing an existing repository.

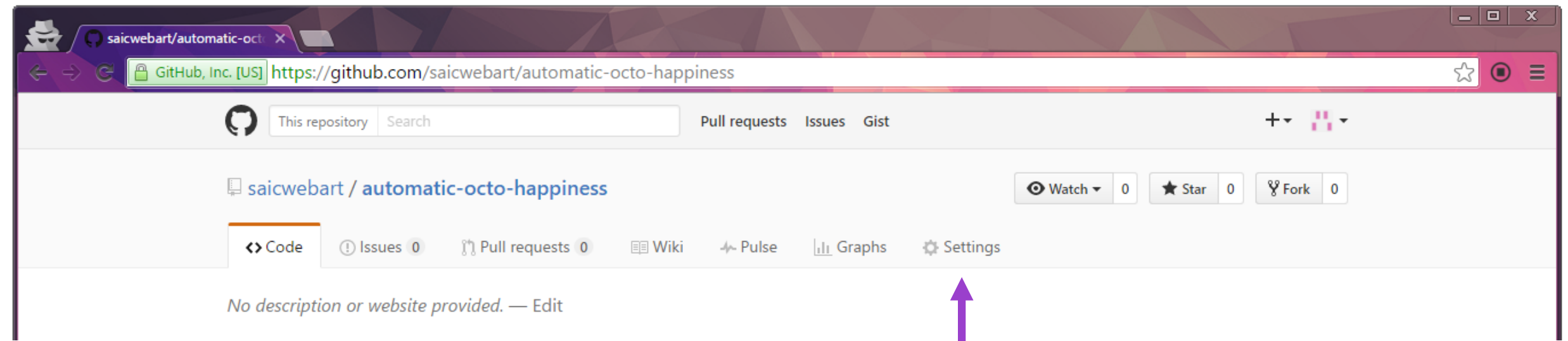
Add .gitignore: None Add a license: None ⓘ

Create repository

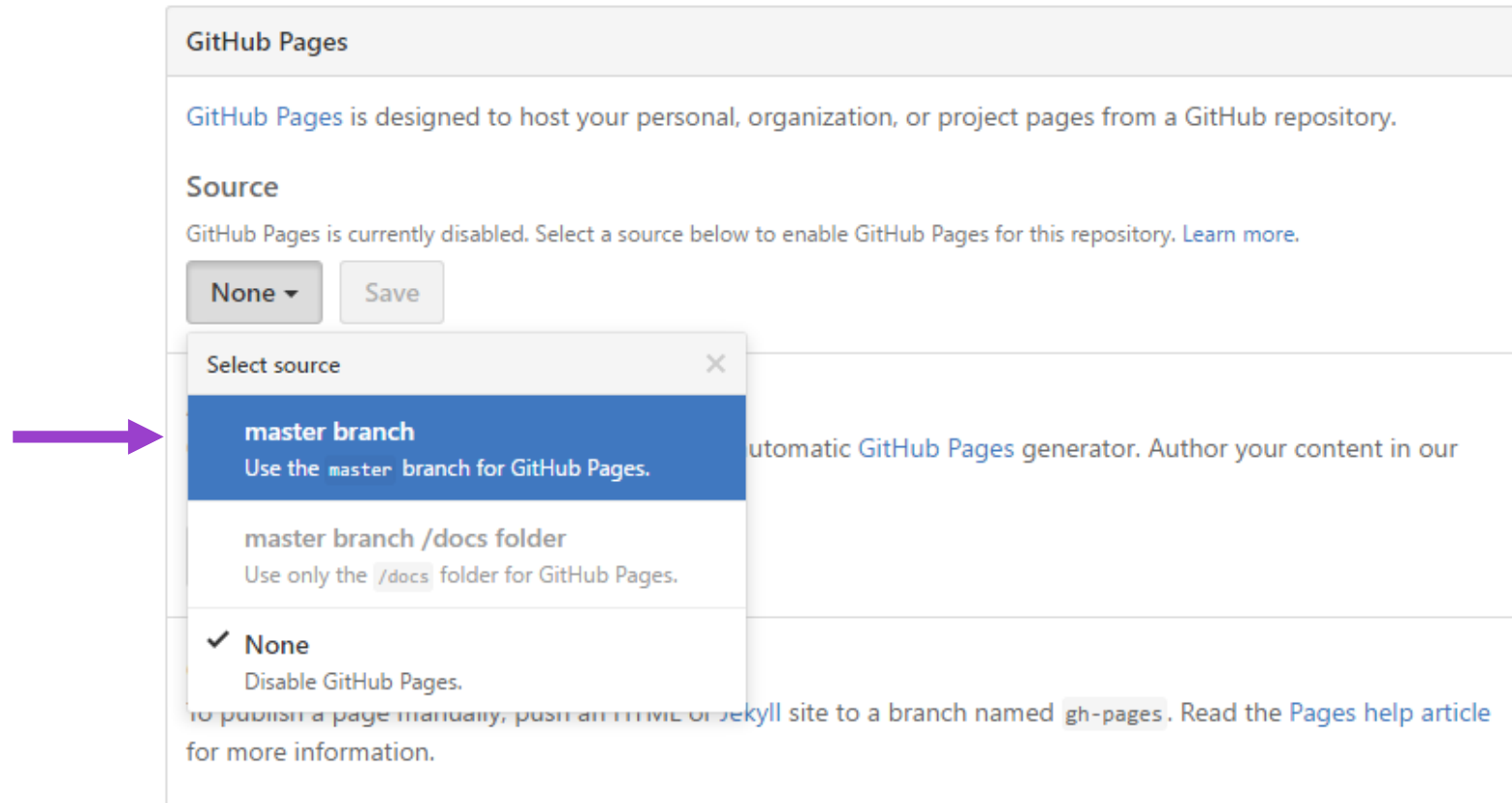
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Contact GitHub API Training Shop Blog About

# Go to Settings



# Setup for GitHub Pages



# Repository Setup Done

**GitHub Pages**

Your site is ready to be published at <https://saicwebart.github.io/automatic-octo-happiness/>.

GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository.

**Source**

Your GitHub Pages site is currently being built from the `master` branch. [Learn more.](#)

master branch ▾

Save

**Custom domain**

Custom domains allow you to serve your site from a domain other than `saicwebart.github.io`. [Learn more.](#)

Save

**Update your site**

To update your site, push your HTML or [Jekyll](#) updates to the `master` branch. Read the [Pages help article](#) for more information.

**Overwrite site**

Replace your existing site by using our automatic page generator. Author your content in our Markdown editor, select a theme, then publish.

Launch automatic page generator

☒ **Enforce HTTPS** — Required for your site because you are using the default domain (`saicwebart.github.io`)  
HTTPS provides a layer of encryption that prevents others from snooping on or tampering with traffic to your site.  
When HTTPS is enforced, your site will only be served over HTTPS. [Learn more.](#)





# Uploading Files



Branch: master ▾


New pull request

Create new file


Upload files

Find file

Clone or download ▾


 mikewesthad committed on GitHub Delete DisneyHorror.jpg

Latest commit ef73e45 just now

 README.md

Initial commit

5 hours ago

 README.md

# miniature-succotash

---





miniature-succotash /



Drag files here to add them to your repository

Or [choose your files](#)



### Commit changes

Add files via upload

Add an optional extended description...

- ☒ Commit directly to the `master` branch.
- ☐ Create a new branch for this commit and start a pull request. [Learn more about pull requests.](#)



Commit changes

Cancel



# Where's My File?

- Files are relative to:
  - `http://username.github.io/repository`
- “index.html” would be:
  - `https://saicwebart.github.io/stunning-octo/index.html`
- “second-page.html” would be:
  - `https://saicwebart.github.io/stunning-octo/second-page.html`

Branch: master ▾


New pull request

Create new file





Upload files

Find file

Clone or download ▾

 saicwebart committed on GitHub Add files via upload

Latest commit 5fd46ff just now


 face-tracking	Add files via upload	just now
 README.md	Initial commit	a minute ago
 index.html	Add files via upload	just now
 second-page.html	Add files via upload	just now





# Where's My File?

- Same repository
- “index.html” inside of face-tracking/ would be:
  - <https://saicwebart.github.io/stunning-octo/face-tracking/index.html>
- “nose-tracker.html” inside of face-tracking/ would be:
  - <https://saicwebart.github.io/stunning-octo/face-tracking/nose-tracker.html>

Branch: master ▾ [stunning-octo-invention](#) / [face-tracking](#) / [Create new file](#) [Upload files](#) [Find file](#) [History](#)

 **saicwebart** committed on **GitHub** Create nose-tracker.html Latest commit d42484d just now

..		
 <a href="#">index.html</a>	Add files via upload	3 minutes ago
 <a href="#">nose-tracker.html</a>	Create nose-tracker.html	just now