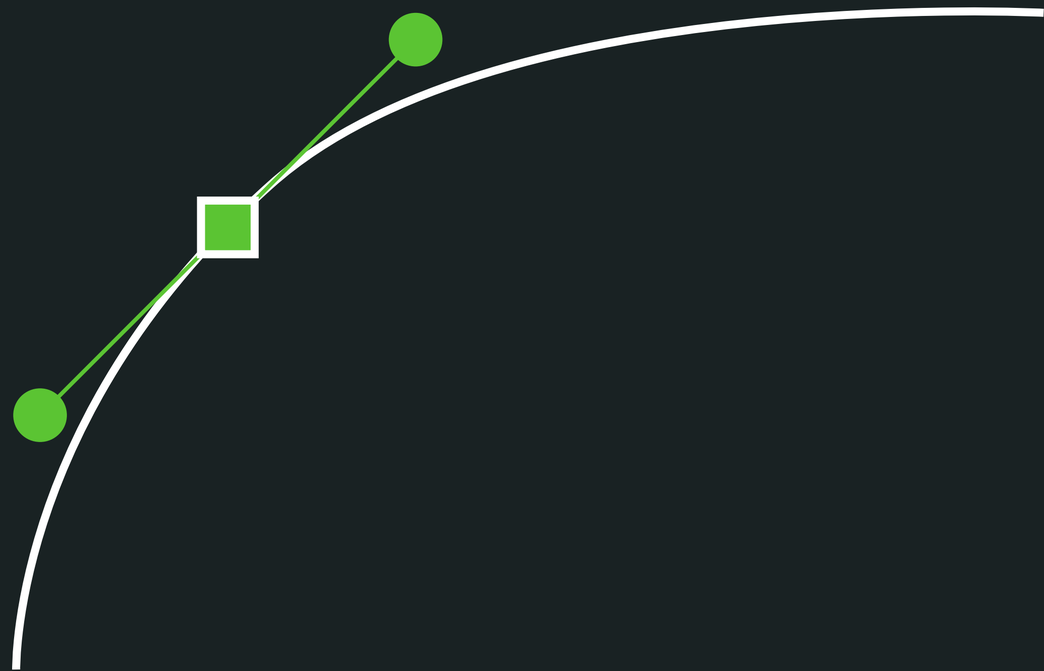
What You Should Know Before Going Vector

David Deraedt | Creative Cloud Consultant, Adobe



Disclaimer

I’m a fraud

Disclaimer

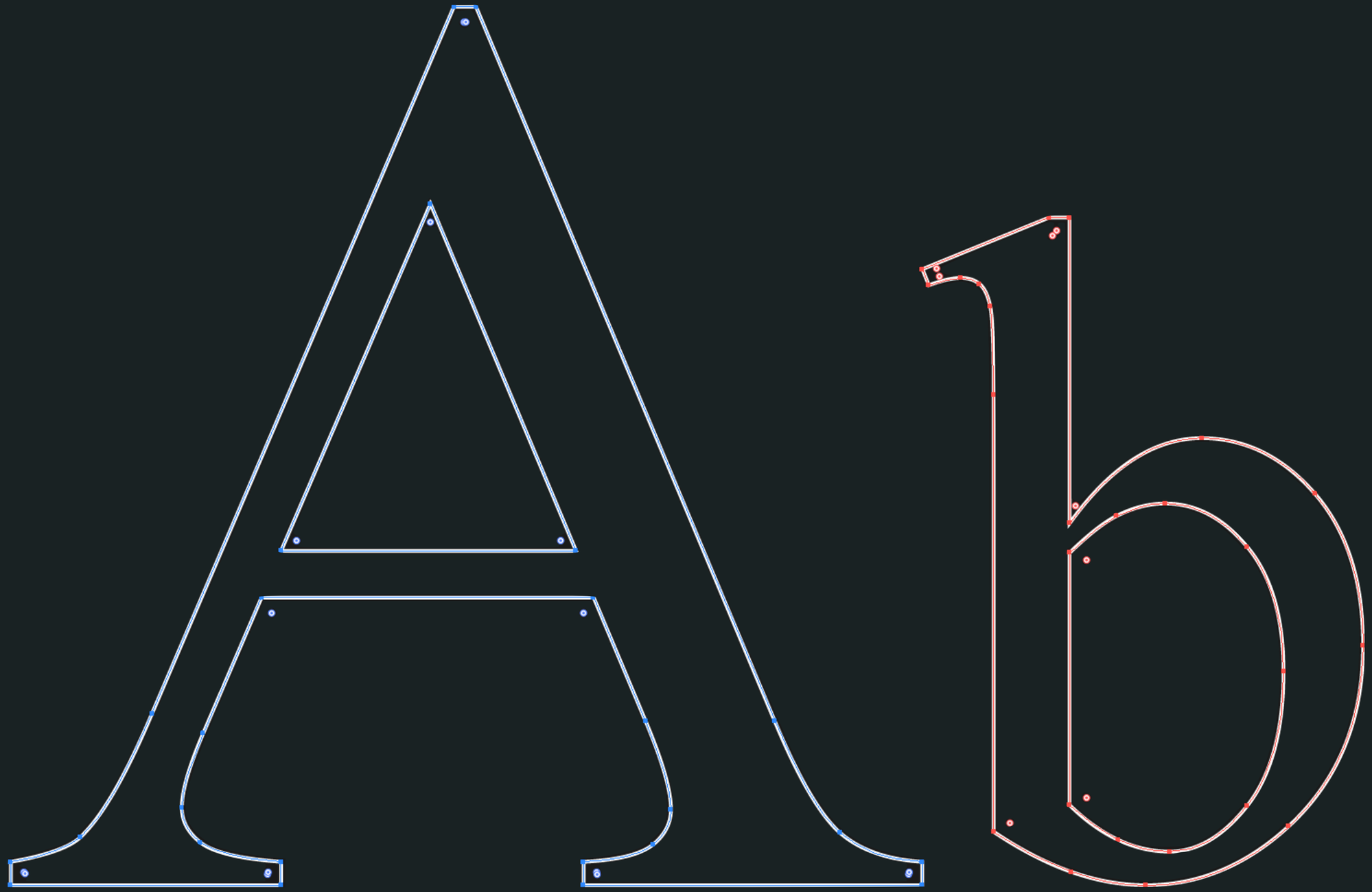
Even worse,
I'm a *french* fraud

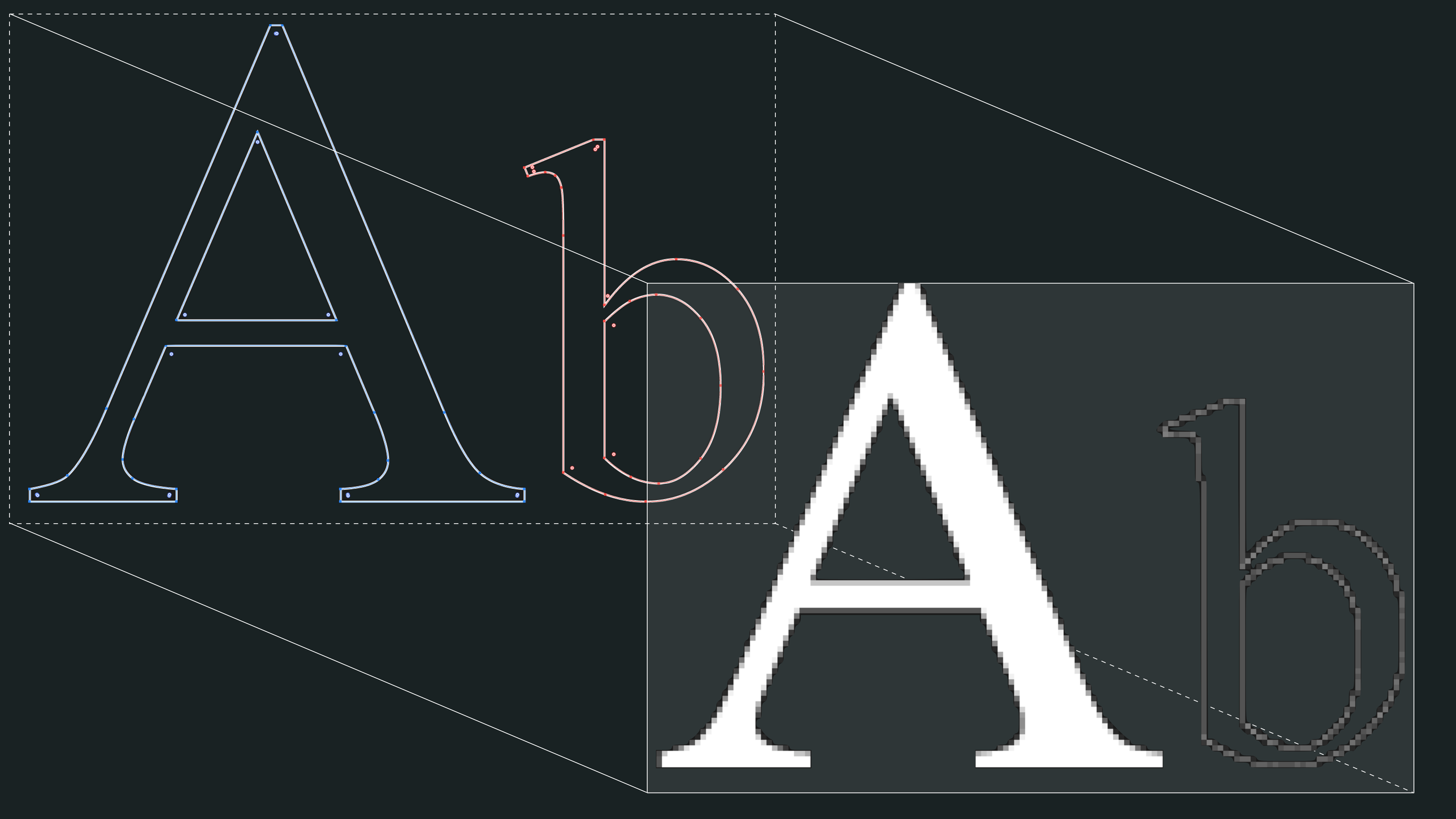
But I know people

JC Suzanne

+

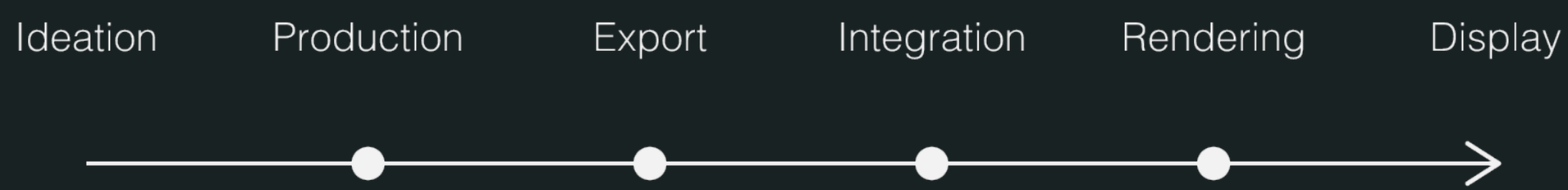
Jon Da Costa


Ab


Ab
Ab

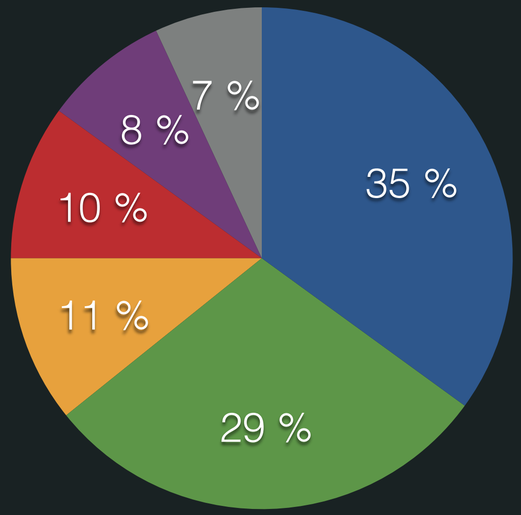
Scalability
Expressiveness
File Size*

Rasterizing at the right time



What do people use vectors for?

A



©Google

©Seb NIARK1 FERAUT

Escape From Pixel Hell

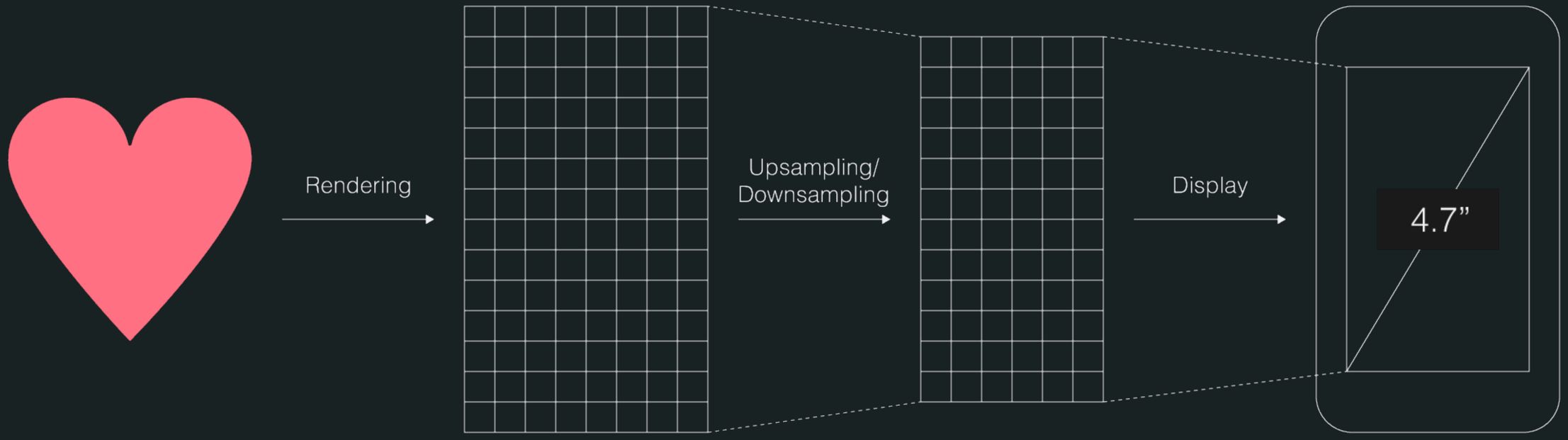


Image
Pixel Resolution

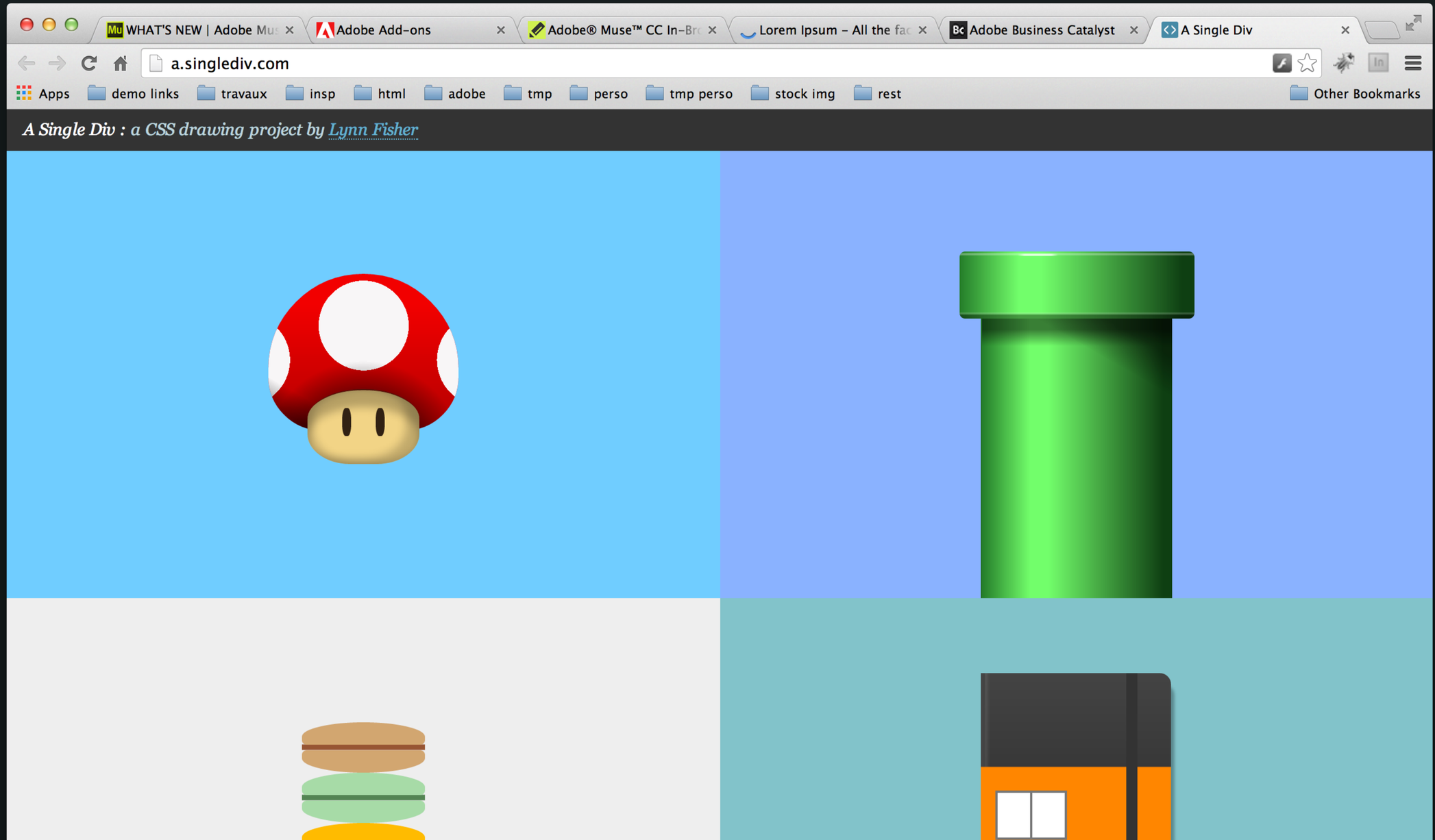
Rendering
Pixel Resolution

Physical
Pixels Resolution

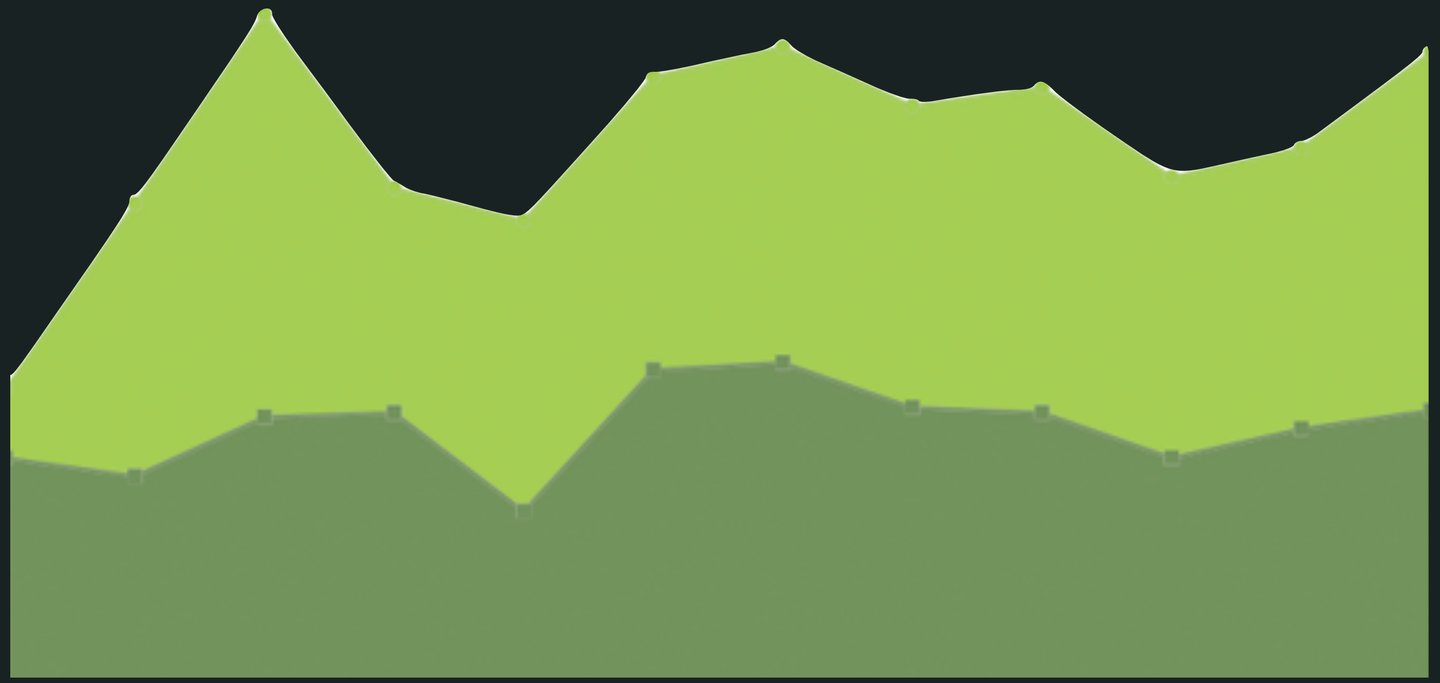
Physical
Screen Size

Vectors,
in a Browser

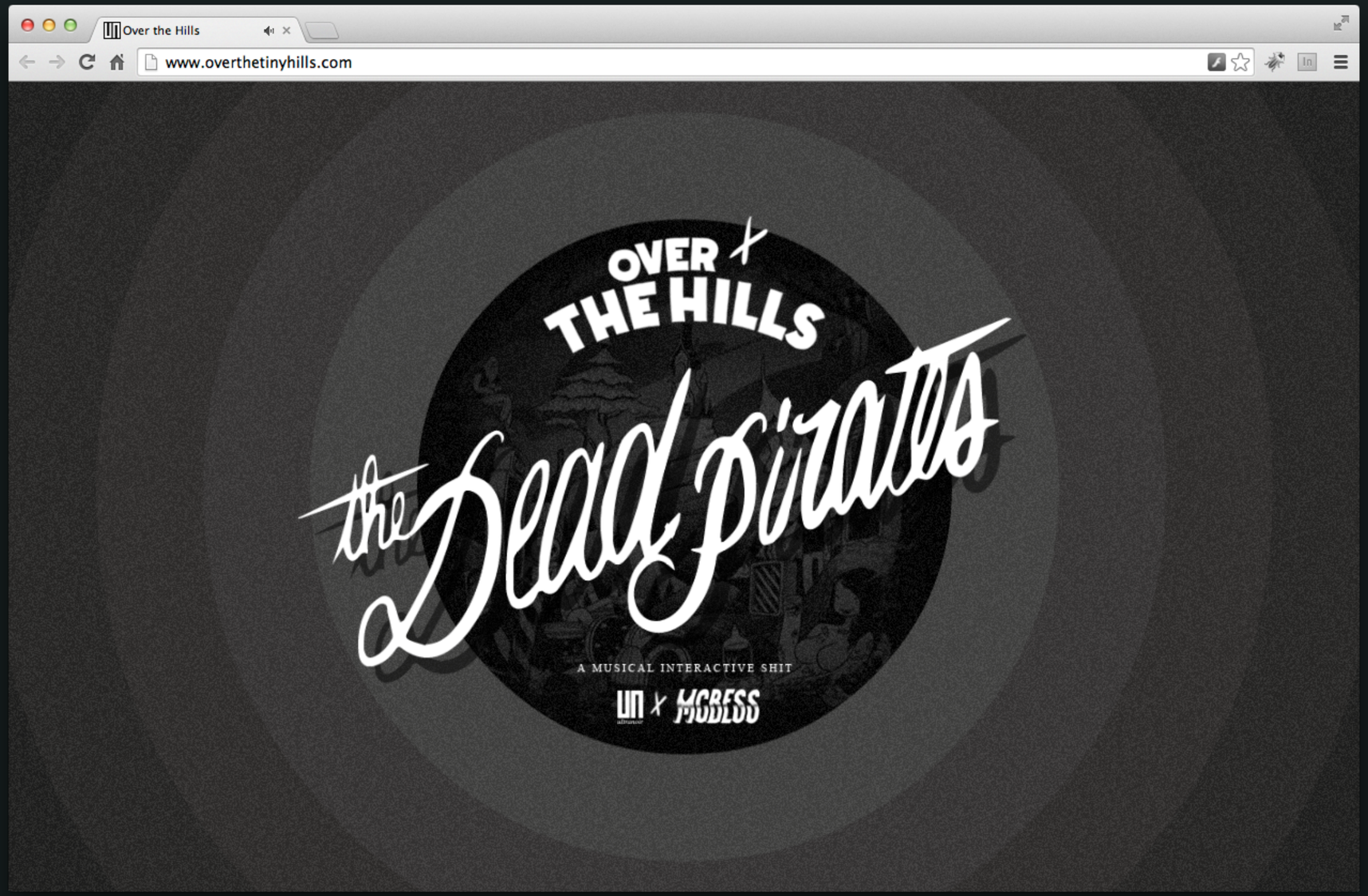
More than just SVG



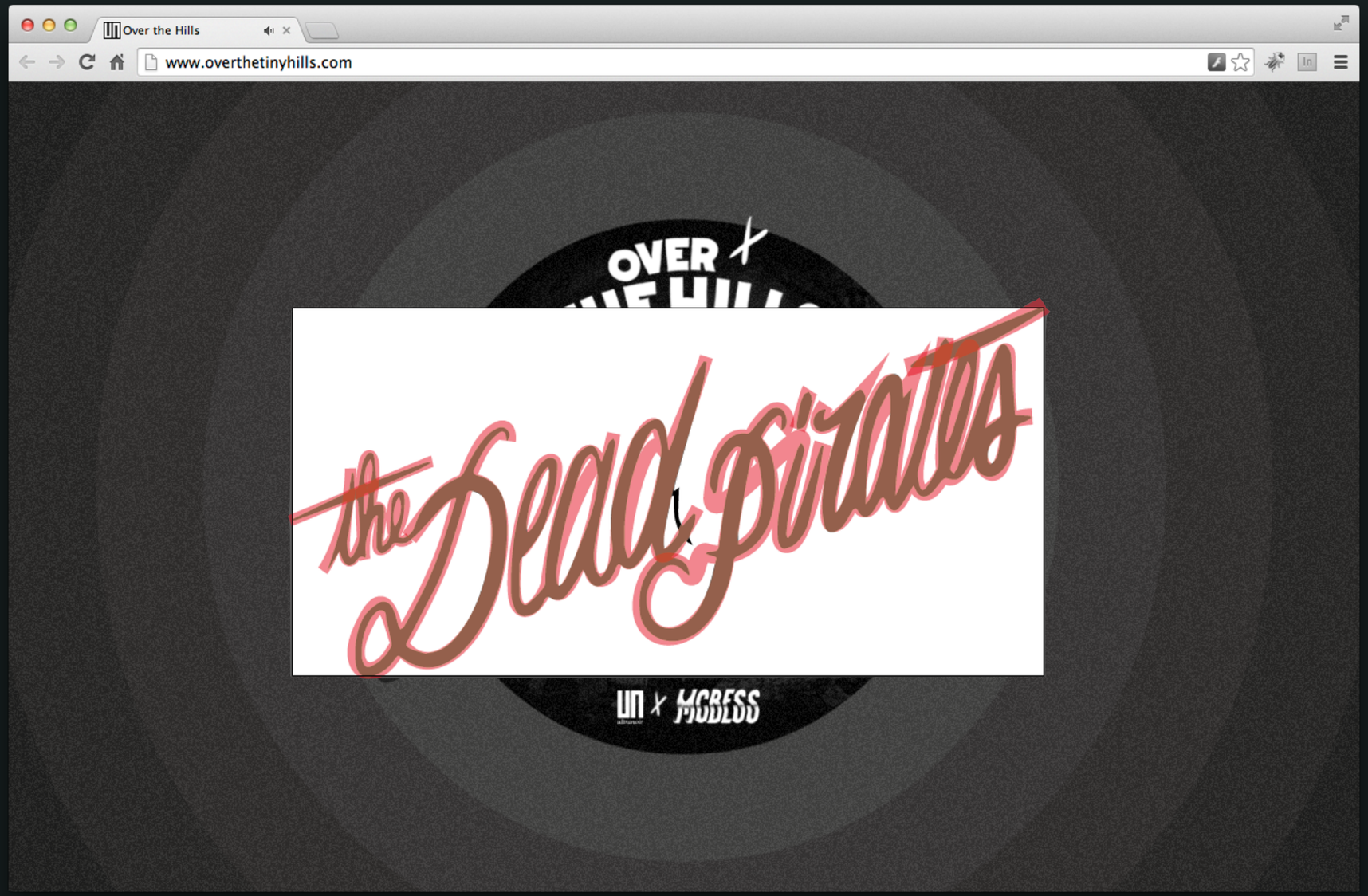
Vectors in the canvas (2d)



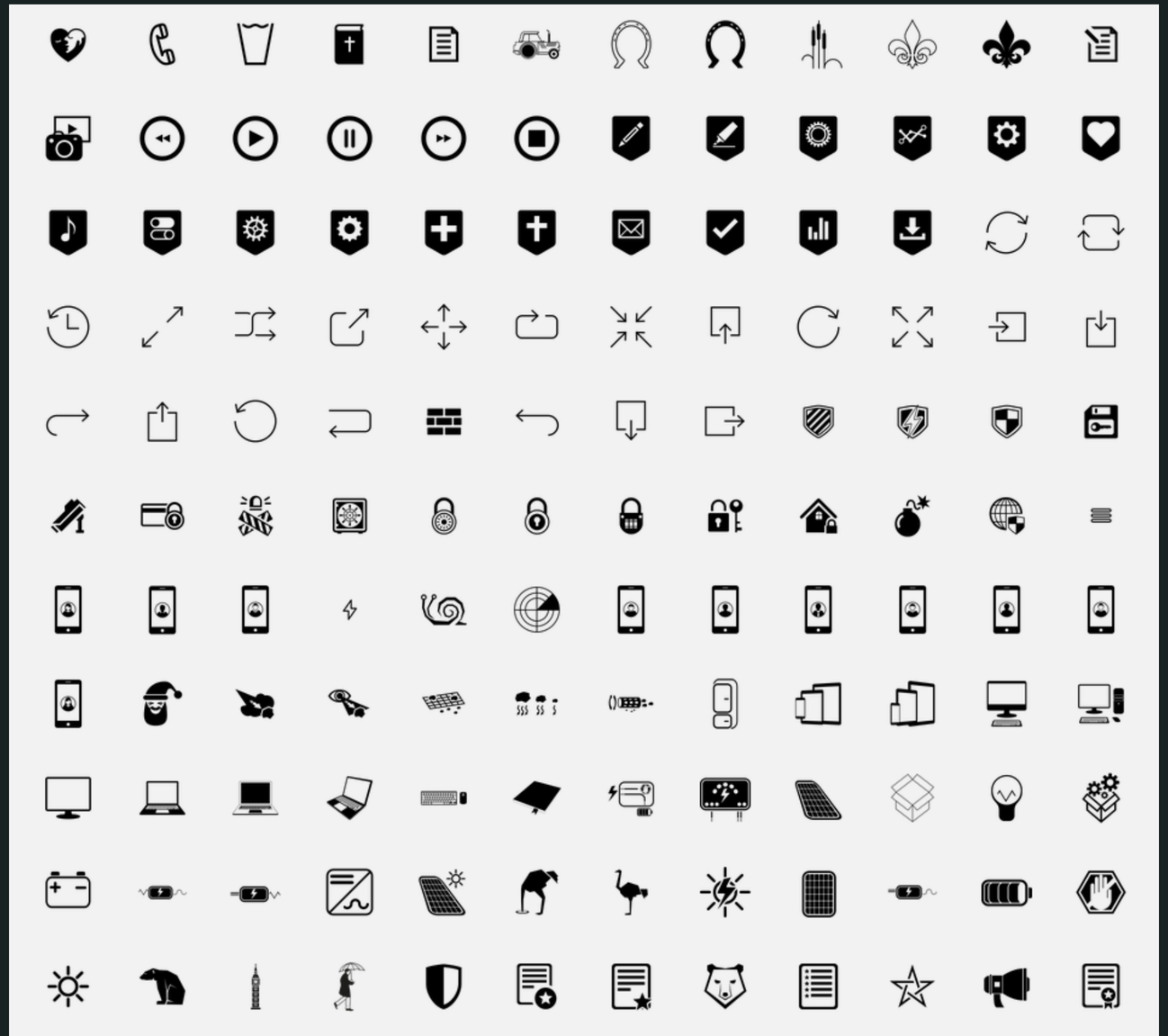
Vectors in the canvas (3d)



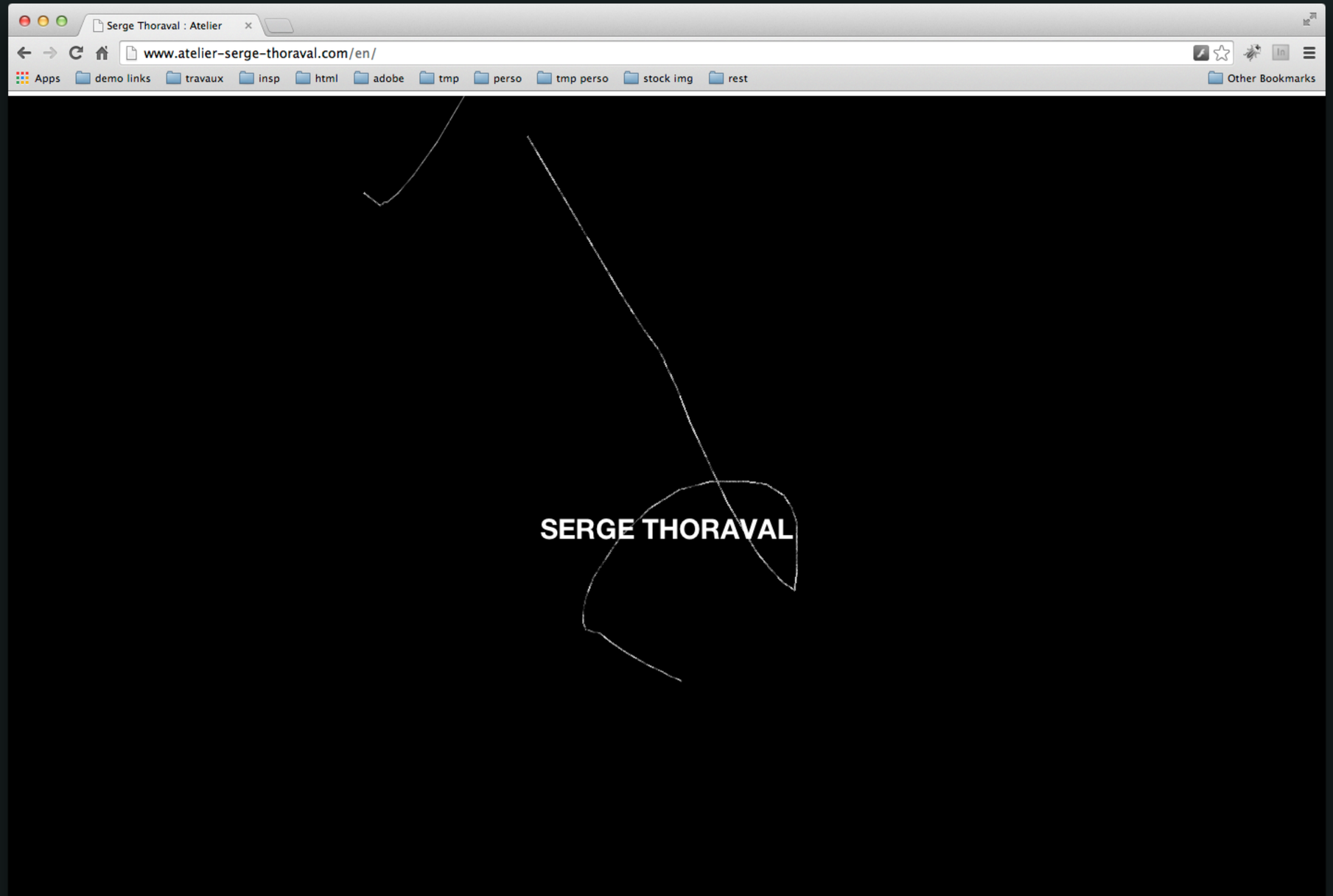
Vectors in the canvas (3d)



Fonts & Icon Fonts



Atelier Serge Thoraval by JC Suzanne & J DaCosta

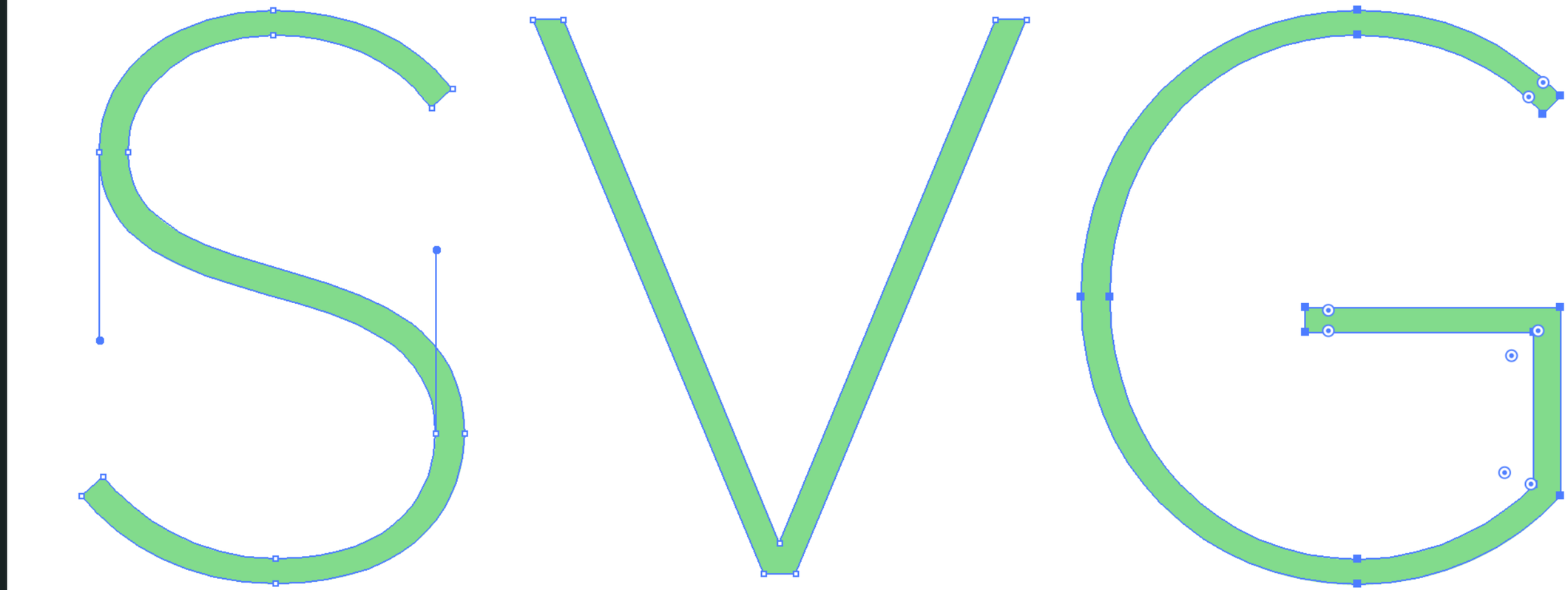


Fonts & Icon Fonts Pros

- ➡ Scalable since it’s a true vectors icon set w/ transparent background
- ➡ Can be styled via CSS just like text
- ➡ Monochromatic, but stackable
- ➡ Relies on @font-face support: great support… but not perfect

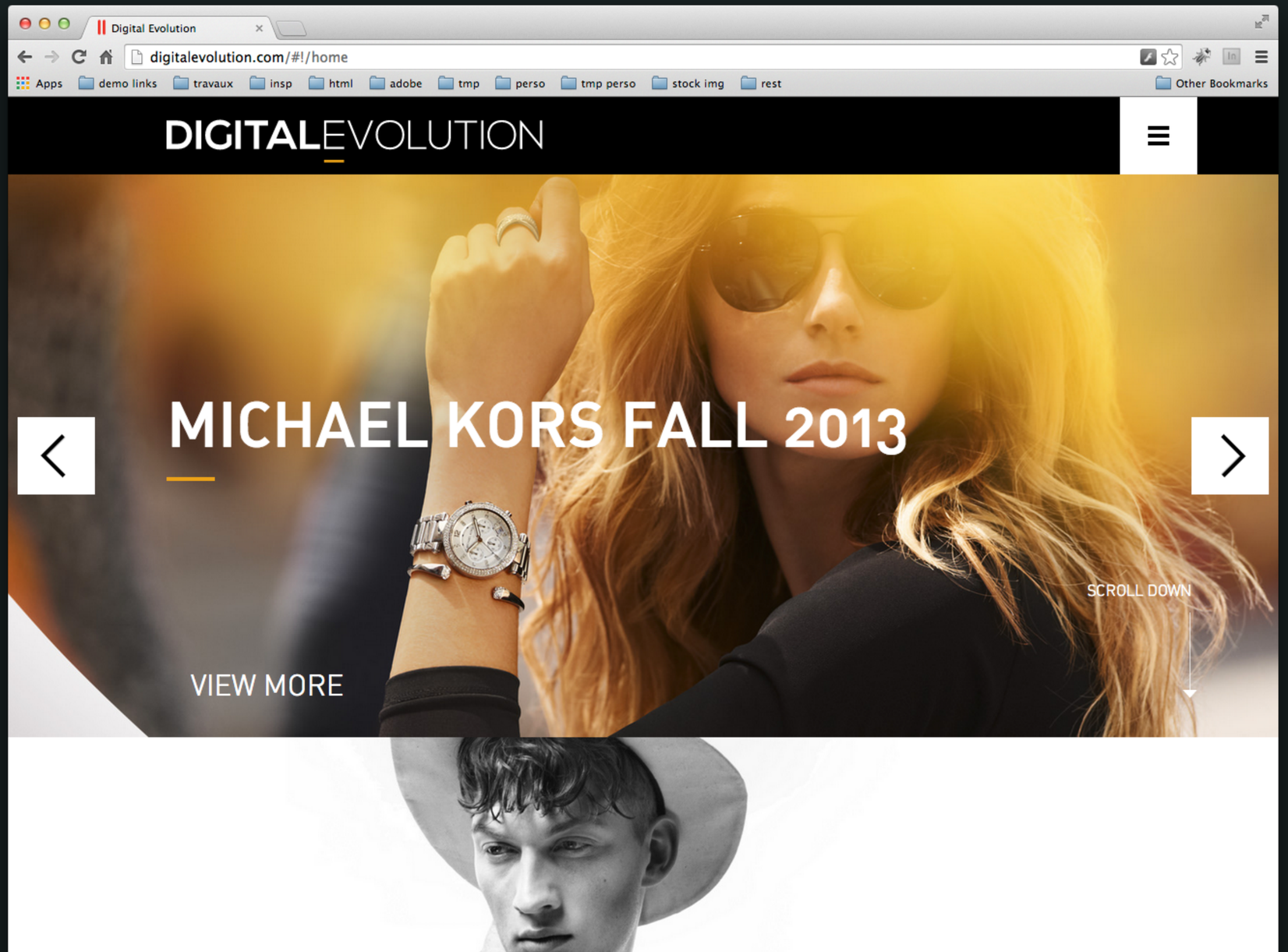
Fonts & Icon Fonts Cons

- ➡ Monochromatic
- ➡ Mixed Rendering using the system’s font renderer & AA system
- ➡ Positioning can be mess
- ➡ Not always great for semantics and accessibility
- ➡ Terrible fallback results (e.g. random chars unless PUA)
- ➡ … and other weird browser behaviors that go with such a hack


SVG

SVG is now the best format
to draw vectors
in a browser

Digital Evolution by HKI



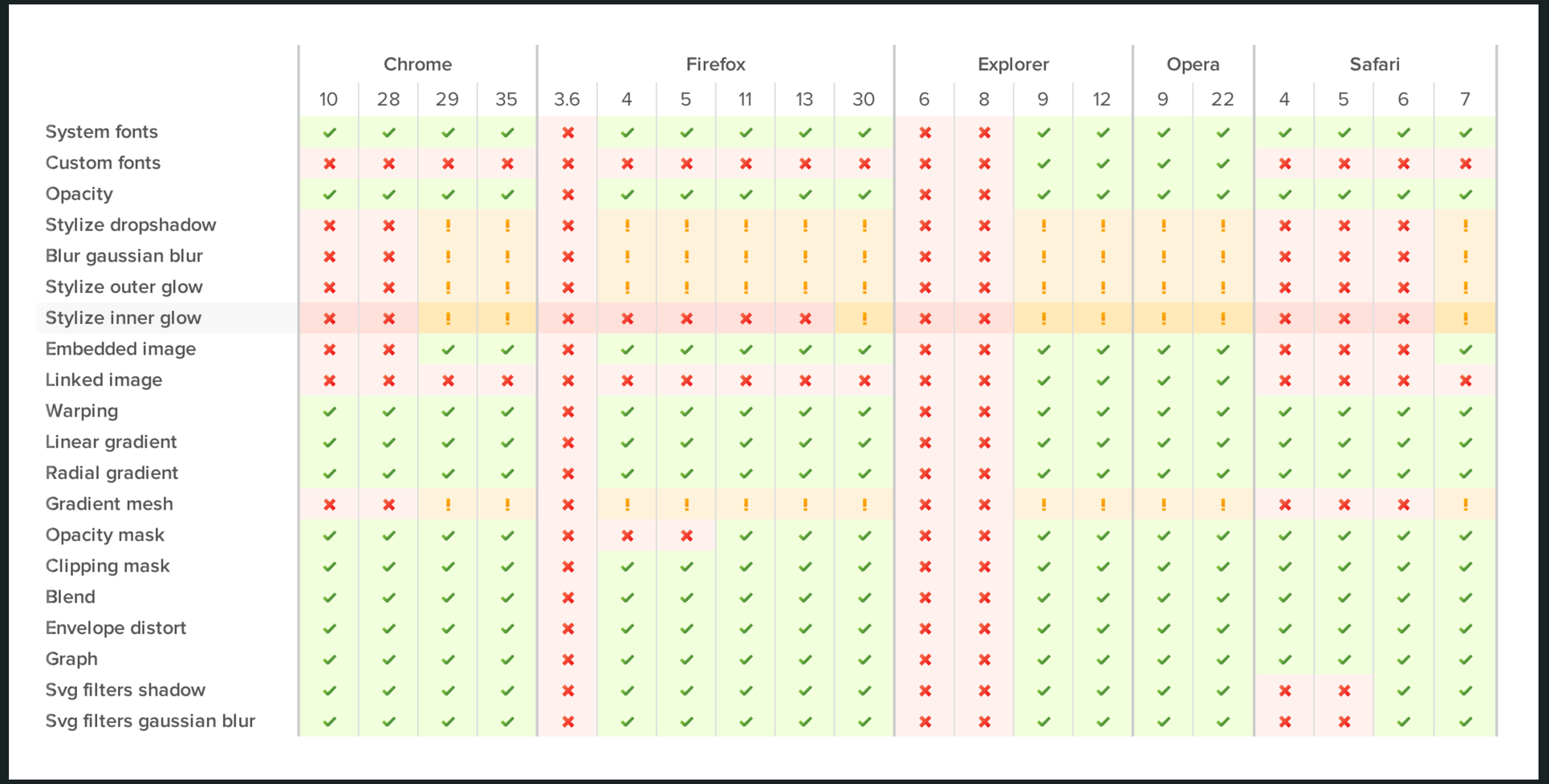
Our Agenda

- What is SVG?
- How to create SVG?
- How to optimize SVG?
- How to integrate SVG?
- How to animate SVG?

SVG

- XML based vector 2d image format
- W3C Standard - it doesn’t belong to a privately owned company
- Paths, shapes / primitives, text, bitmaps (aka raster) images
- CSS styling via pres attributes, inline styles, <style> & external CSS!
- Blend modes & filters (aka effects)*
- Challenging interactive / animation model
- Fragmentation is more than just “support”, it’s about fidelity

Ouch...



	Chrome				Firefox						Explorer				Opera		Safari			
	10	28	29	35	3.6	4	5	11	13	30	6	8	9	12	9	22	4	5	6	7
System fonts	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓
Custom fonts	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✗	✗	✗	✗
Opacity	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓
Stylize dropshadow	✗	✗	!	!	✗	!	!	!	!	!	✗	✗	!	!	!	!	✗	✗	✗	!
Blur gaussian blur	✗	✗	!	!	✗	!	!	!	!	!	✗	✗	!	!	!	!	✗	✗	✗	!
Stylize outer glow	✗	✗	!	!	✗	!	!	!	!	!	✗	✗	!	!	!	!	✗	✗	✗	!
Stylize inner glow	✗	✗	!	!	✗	✗	✗	✗	✗	!	✗	✗	!	!	!	!	✗	✗	✗	!
Embedded image	✗	✗	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✗	✗	✗	✓
Linked image	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✗	✗	✗	✗
Warping	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓
Linear gradient	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓
Radial gradient	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓
Gradient mesh	✗	✗	!	!	✗	!	!	!	!	!	✗	✗	!	!	!	!	✗	✗	✗	!
Opacity mask	✓	✓	✓	✓	✗	✗	✗	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓
Clipping mask	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓
Blend	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓
Envelope distort	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓
Graph	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓
Svg filters shadow	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✗	✗	✓	✓
Svg filters gaussian blur	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✗	✗	✓	✓

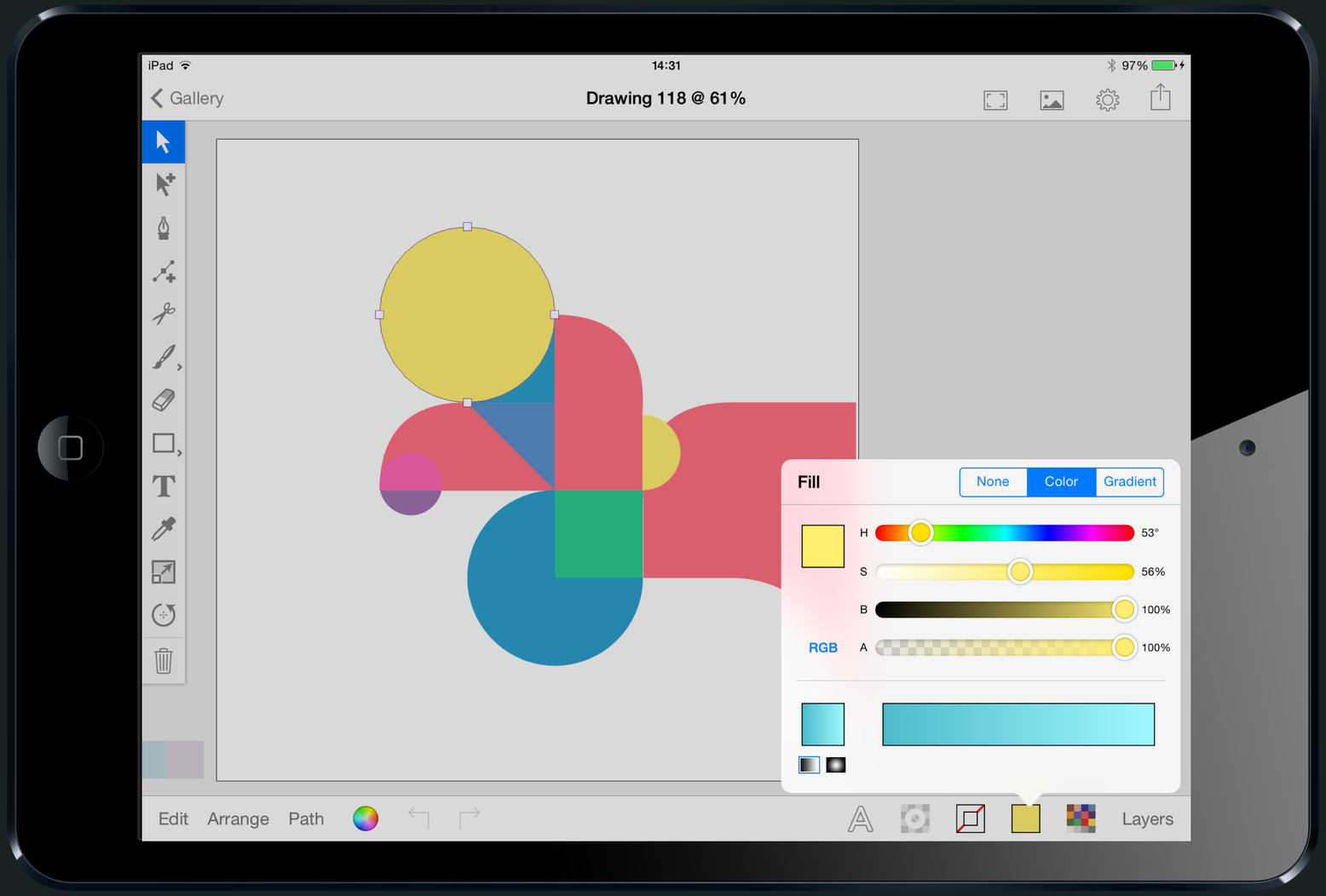
Tim van de Velde

http://voormedia.com/blog/2012/10/creating-svg-vector-graphics-for-maximum-browser-compatibility

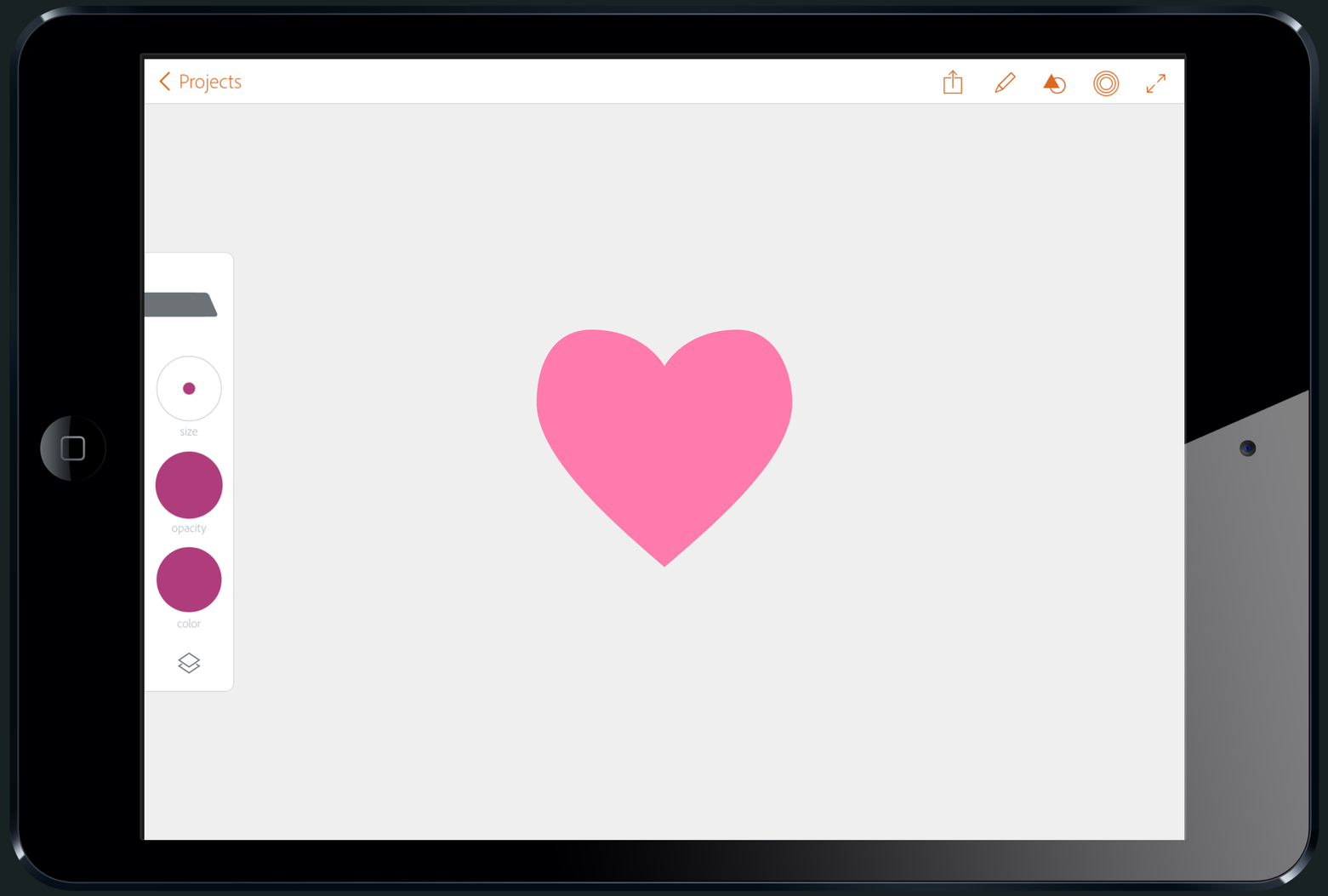
A look at Apple’s App Store badge

The Right Tool
For The Job

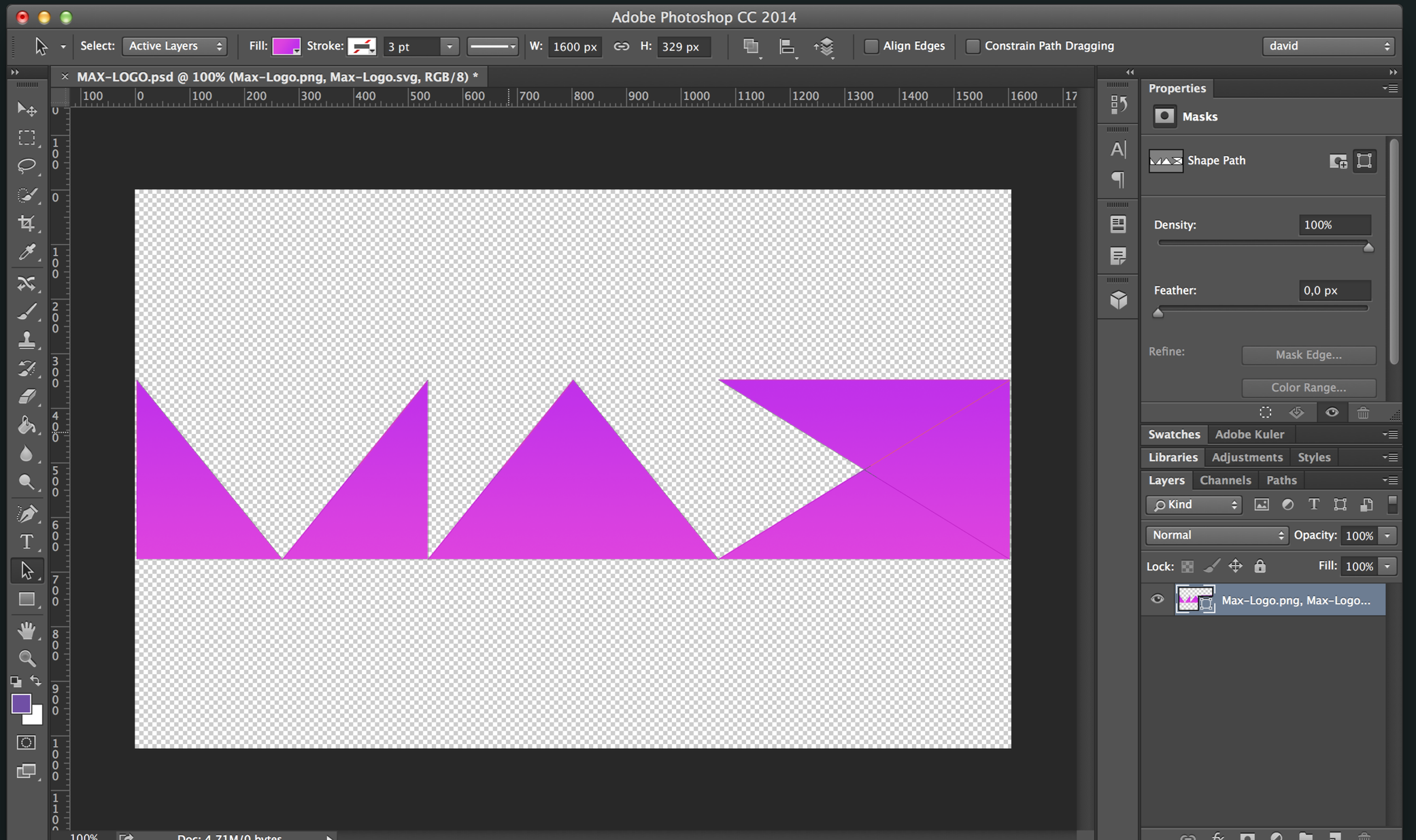
Inkpad for iPad



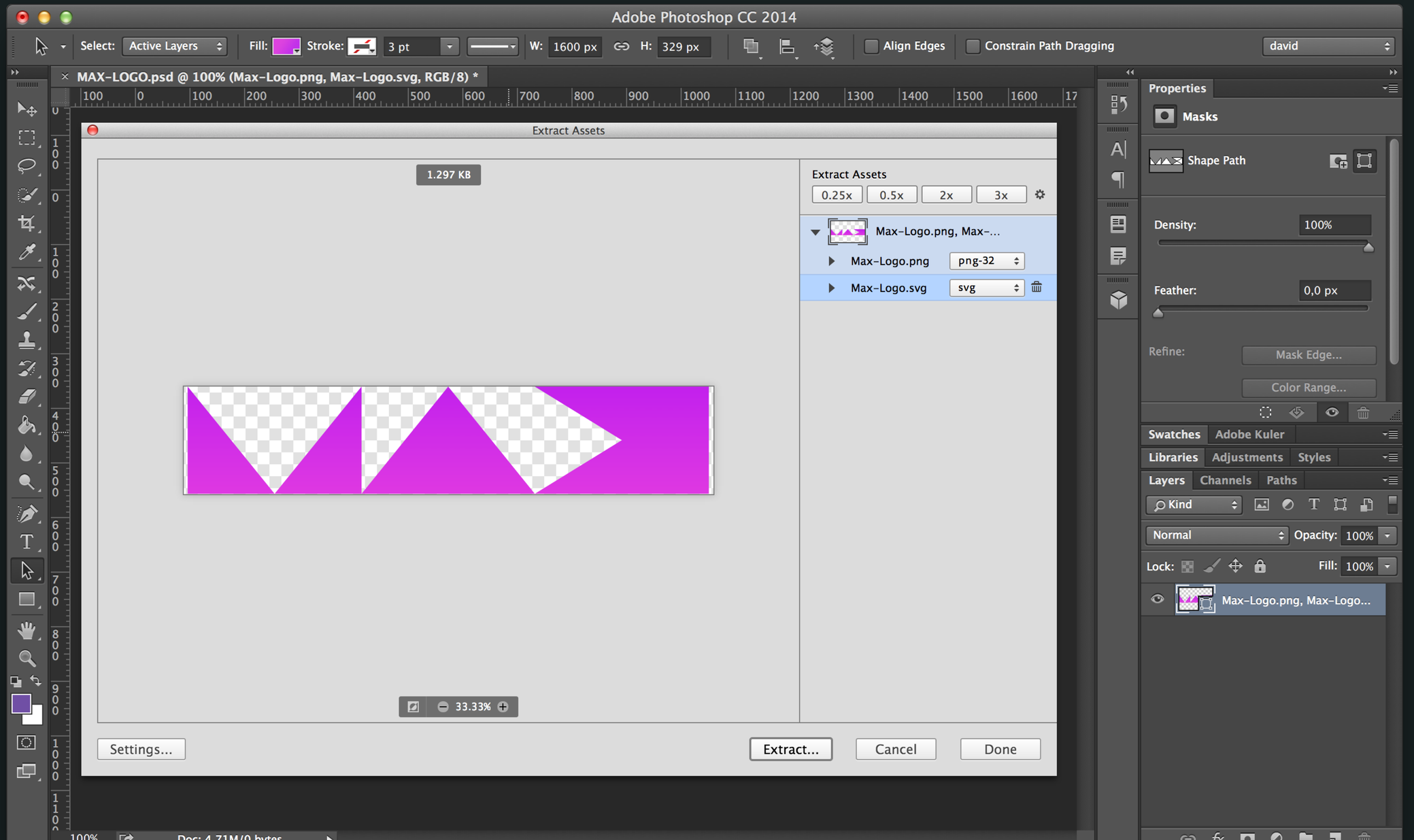
Ideation: Illustrator Draw for iPad



Photoshop


Adobe Photoshop CC 2014
Select: Active Layers
Fill:
Stroke:
3 pt
W: 1600 px
H: 329 px
Align Edges
Constrain Path Dragging
david
MAX-LOGO.psd @ 100% (Max-Logo.png, Max-Logo.svg, RGB/8) *
Properties
Masks
Shape Path
Density: 100%
Feather: 0,0 px
Refine:
Mask Edge...
Color Range...
Swatches
Adobe Kuler
Libraries
Adjustments
Styles
Layers
Channels
Paths
Kind
Normal
Opacity: 100%
Lock:
Fill: 100%
Max-Logo.png, Max-Logo...

Photoshop CC 2014 Extract Assets & SVG support



Sketch

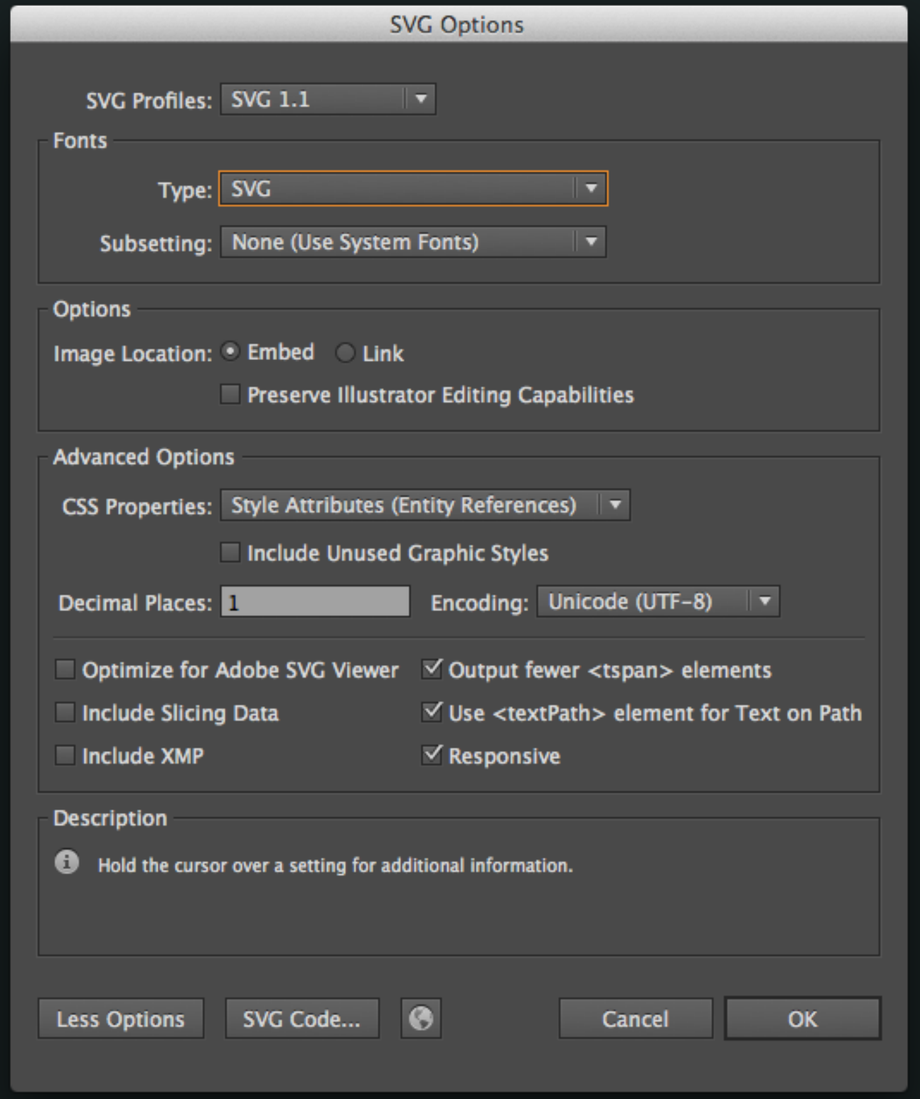

Untitled — Edited
9 Trial Days Remaining
Insert
Group
Ungroup
Create Symbol
132%
Edit
Transform
Rotate
Flatten
Mask
Scale
Union
Subtract
Intersect
Difference
Forward
Backward
Mirror
View
Export
Welcome
1 of 2
Mobile Portrait
Tablet Portrait
Path
Path
Path
Desktop
Path 3
Desktop HD
Instructions —...
Filter
4
Finish Editing
Open Path
Position
559,8
X
403,3
Y
Straight
Mirrored
Disconnected
Asymmetric
Corners
0
Round: None
Fills
Multiply
100 %
Fill
Blending
Opacity
Borders

Illustrator feature highlight

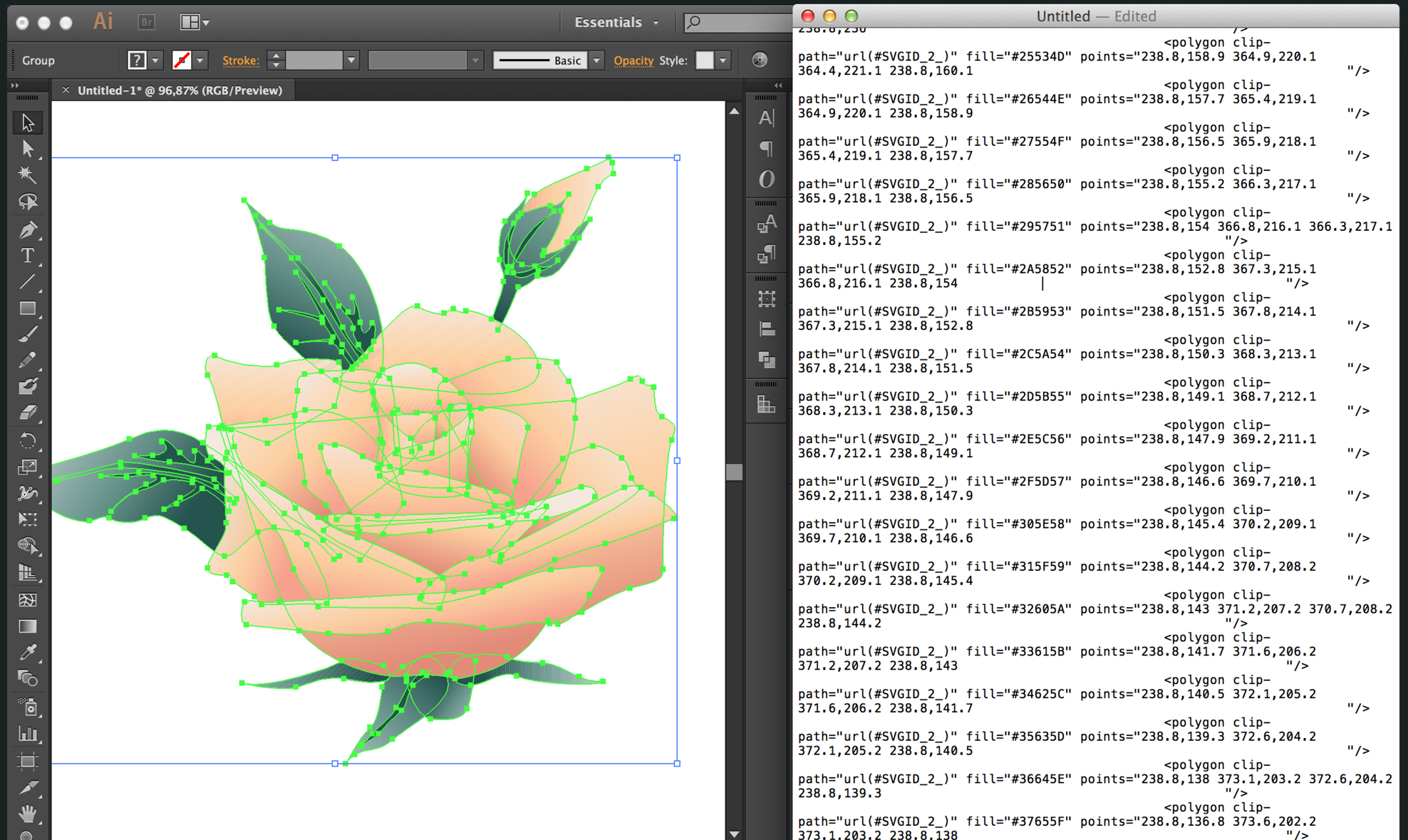
- Great diversity of drawing tools
- Best of class path management tools (shape builder FTW)
- True global, dynamic colors and color redefinition
- Styles for elements, groups, layers, characters, paragraphs
- Advanced extensibility & plugin ecosystem

http://tv.adobe.com/watch/max-2013/theories-and-harmonies-of-color/

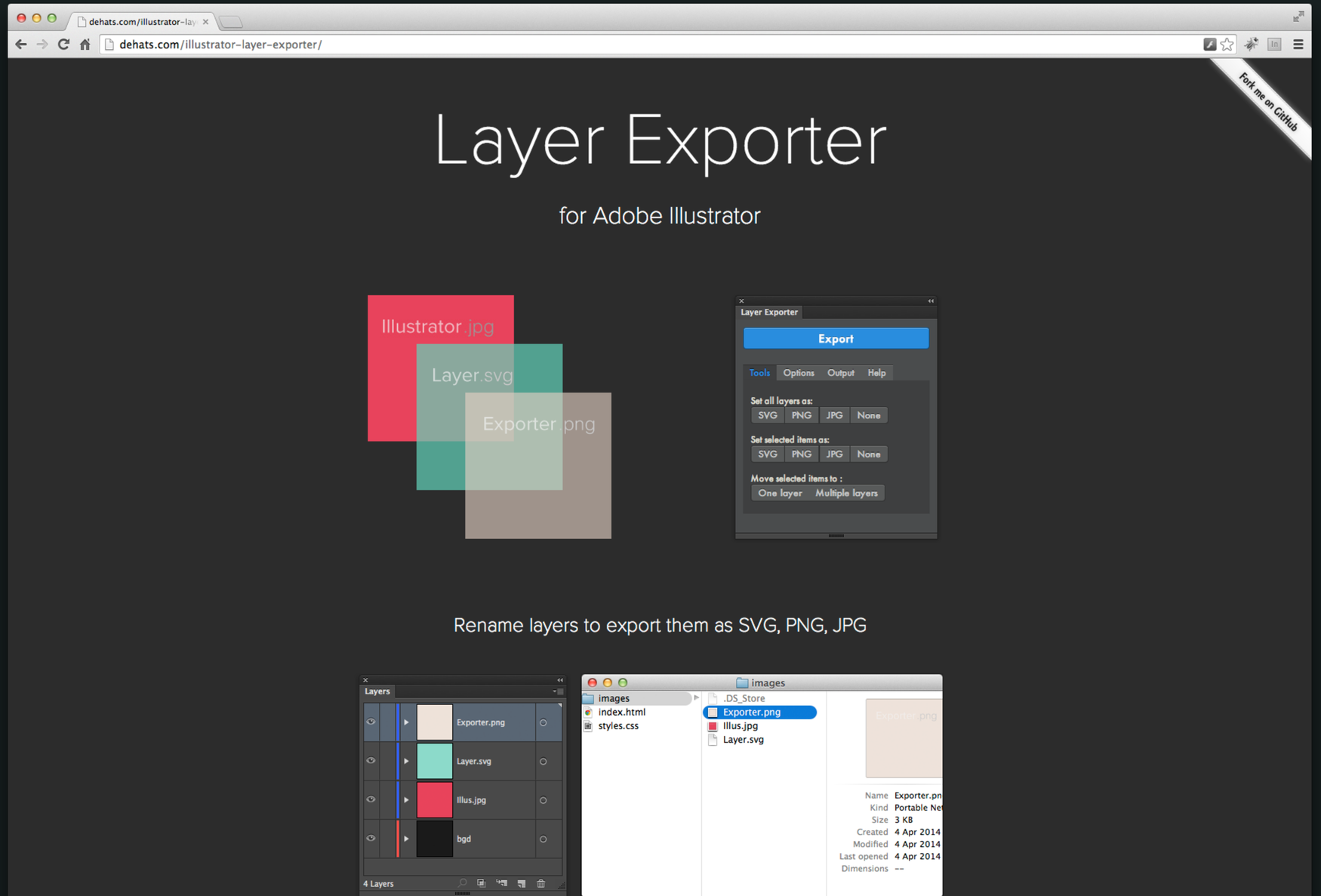
SVG Export Options



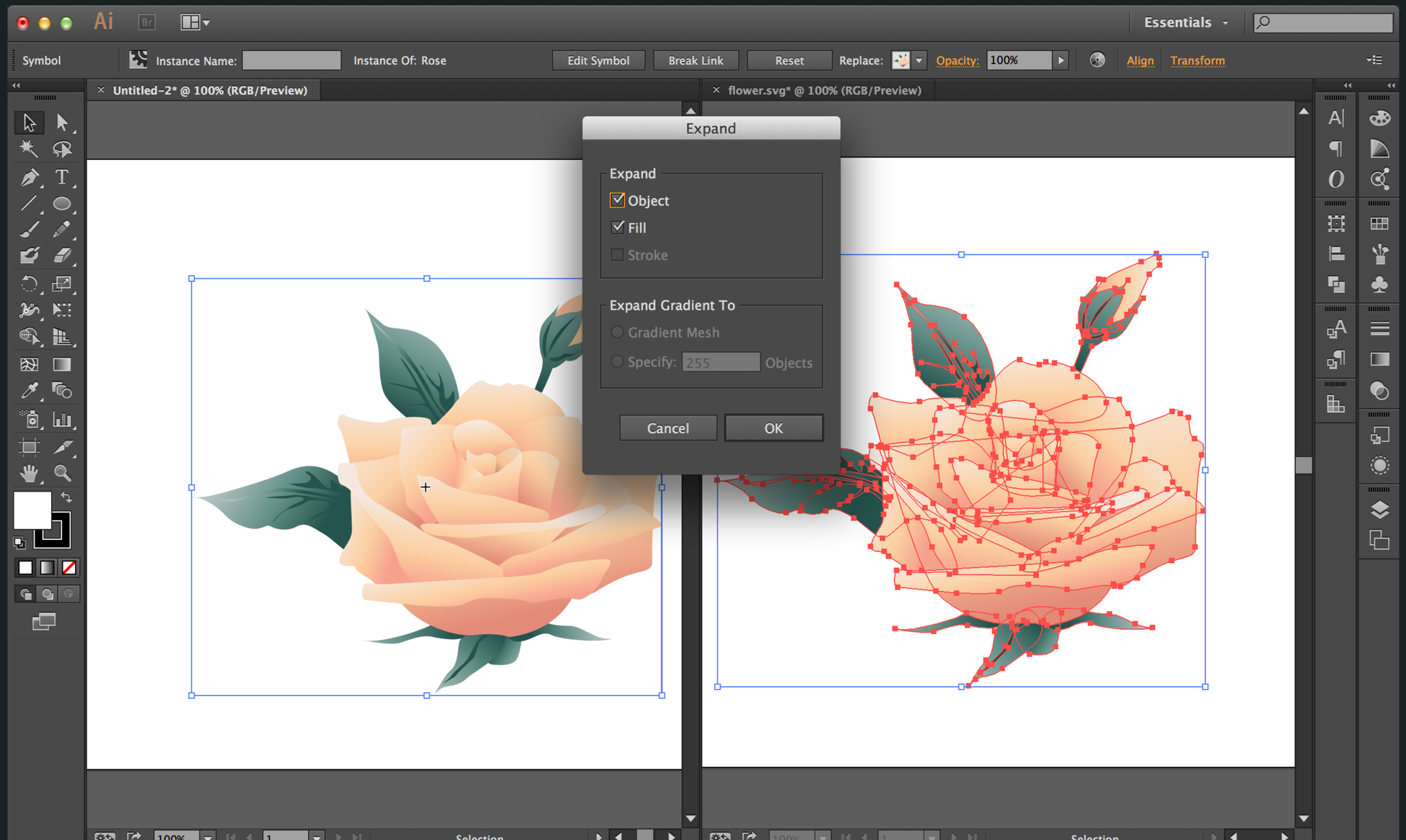
SVG export via copy & paste



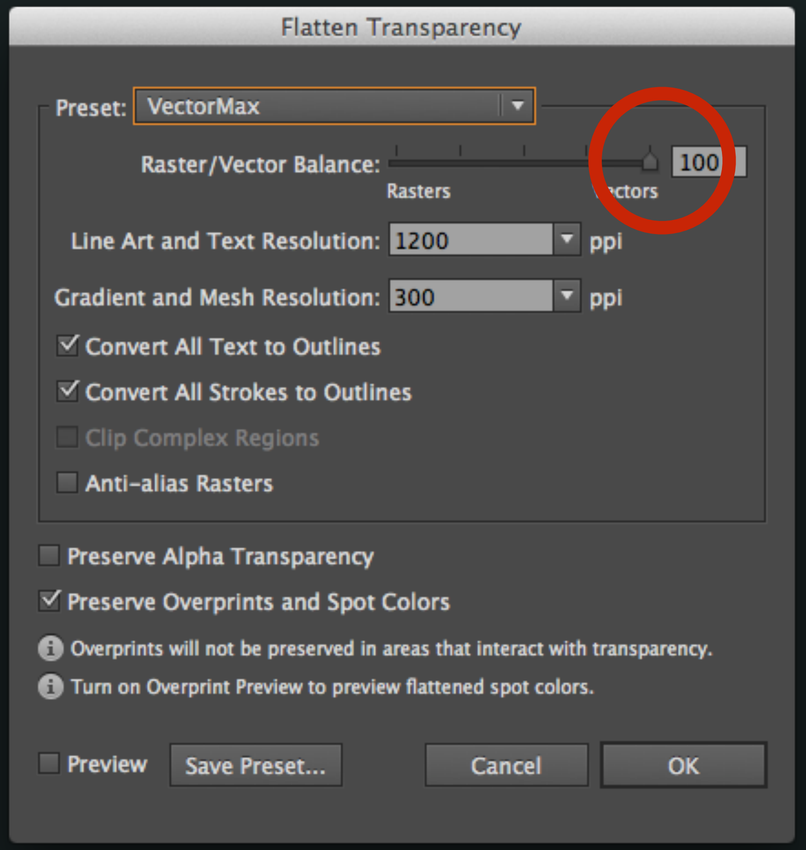
Bulk export with Layer Exporter



Expanding Complex Shapes and Appearance



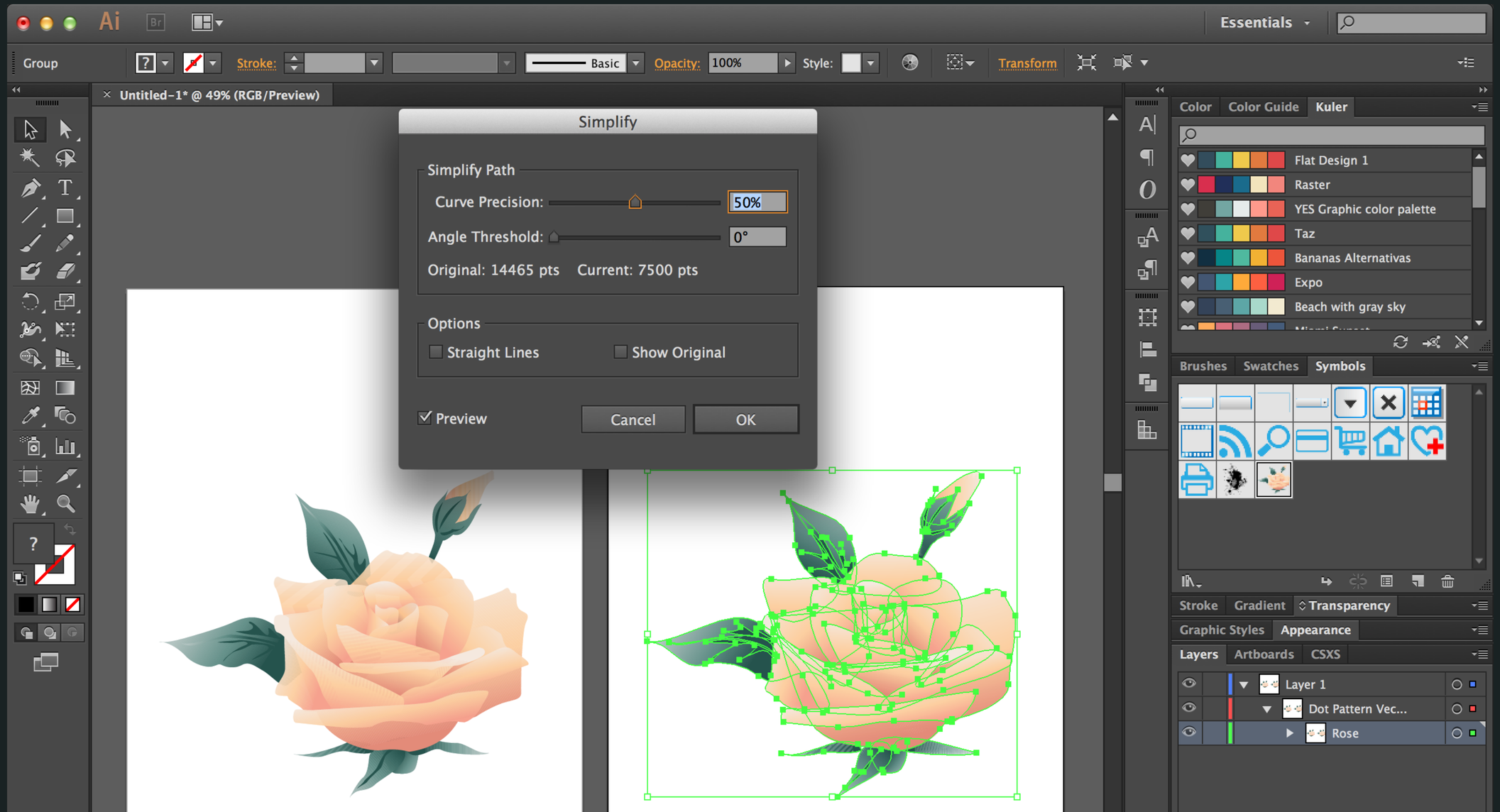
Flattening Blend Modes



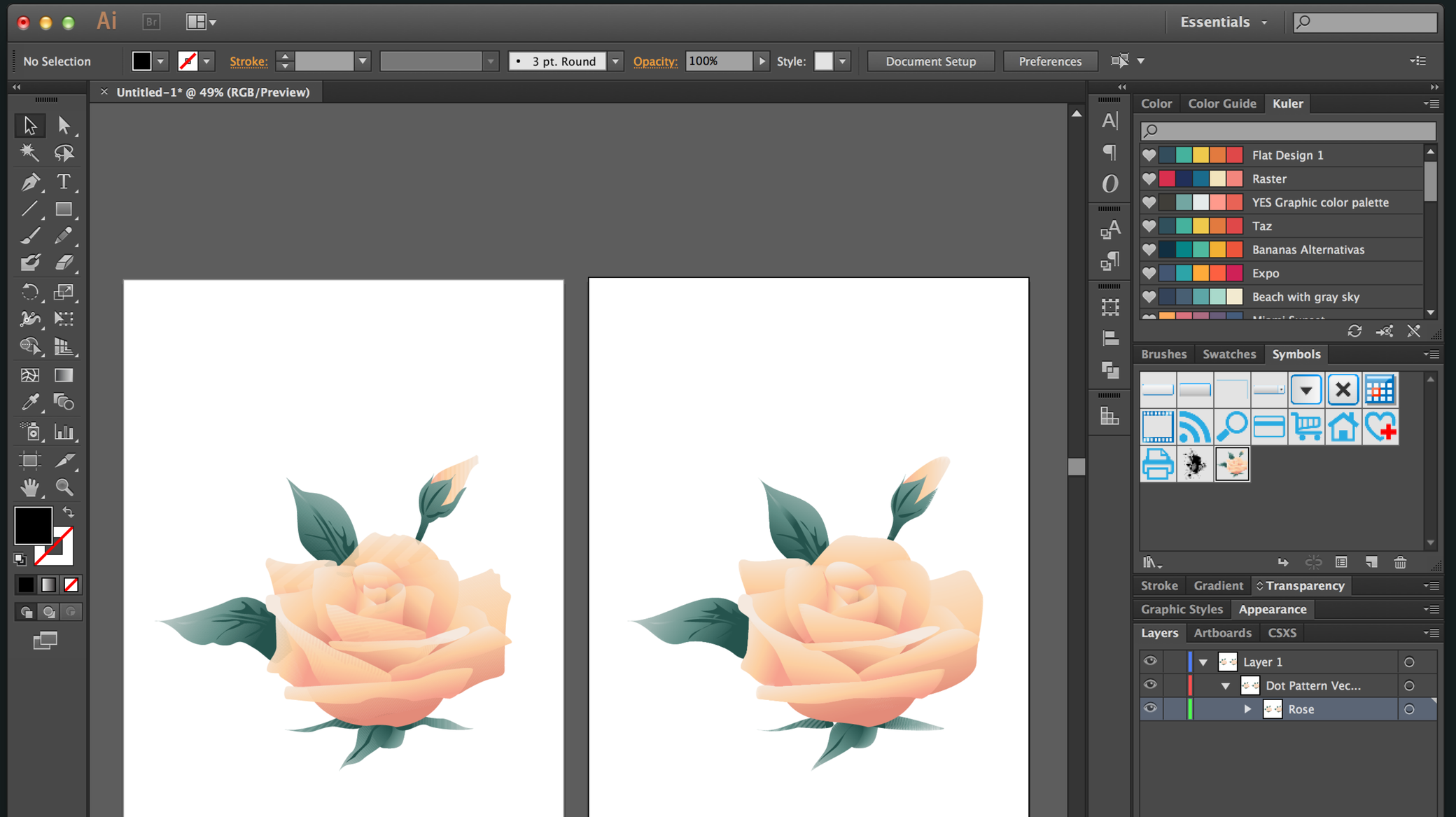
The Red Wedding
by Brian Yap

https://www.behance.net/brianyap

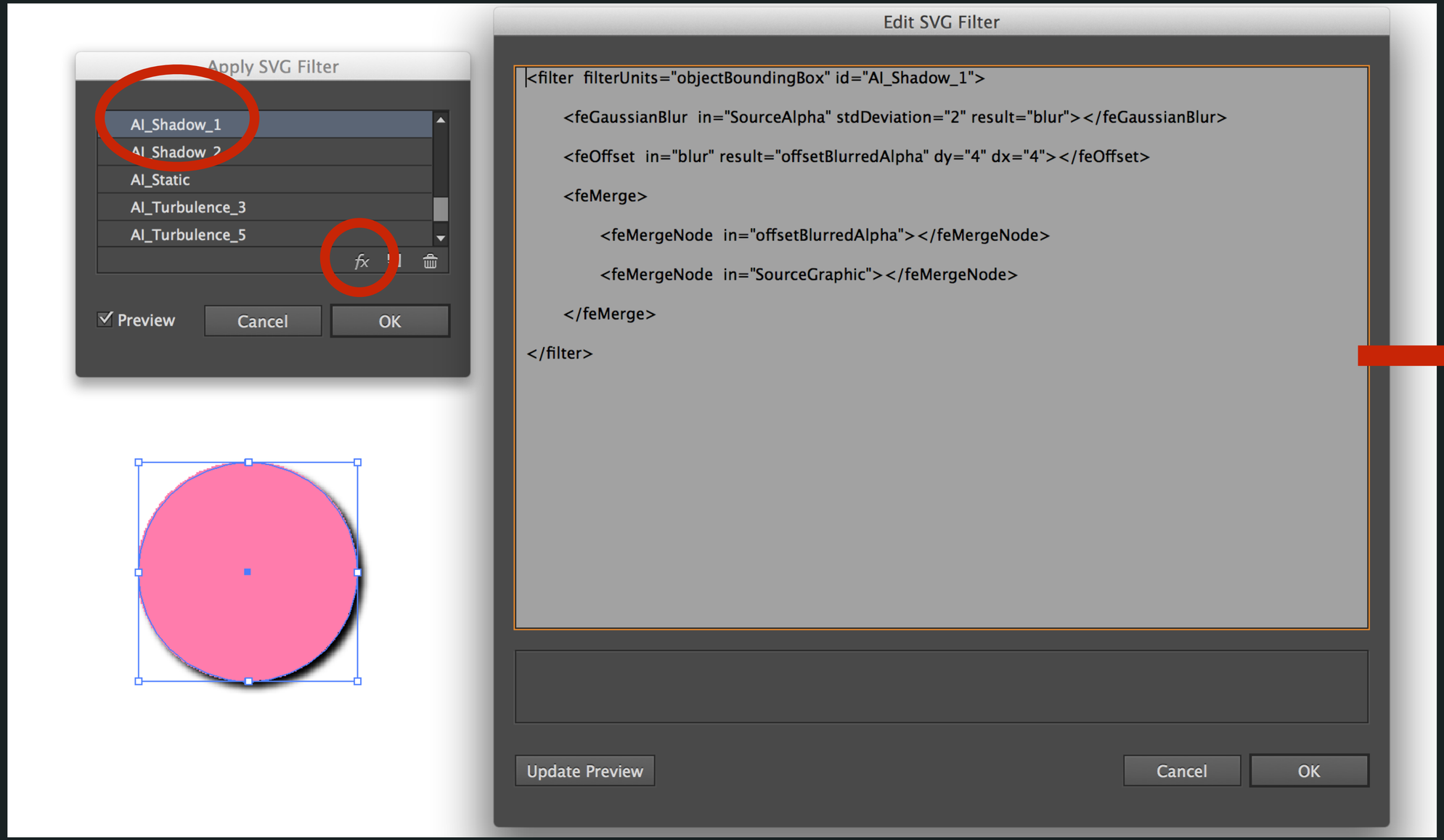
Simplifying paths



Simpliying paths

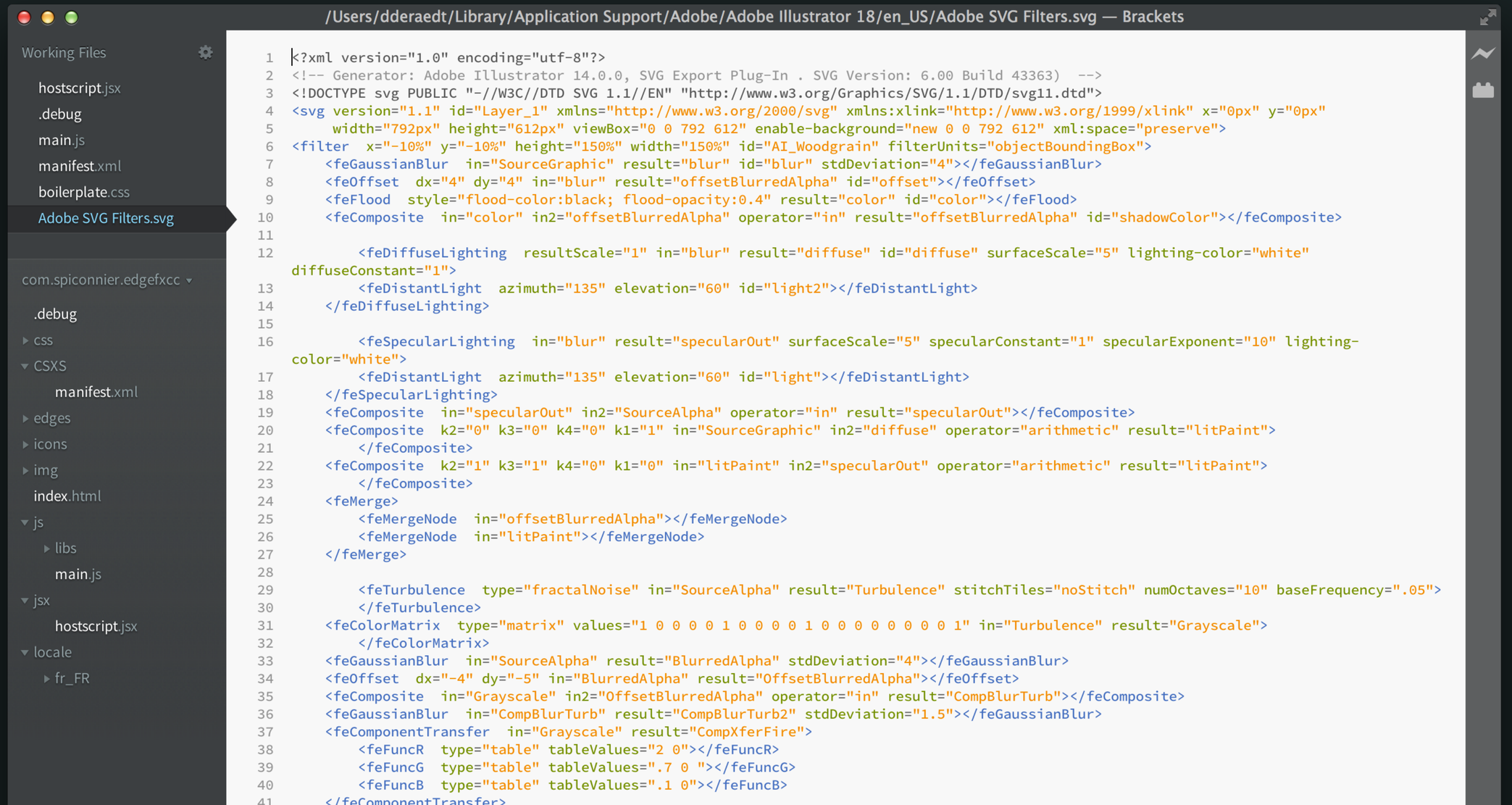


Applying SVG Filters

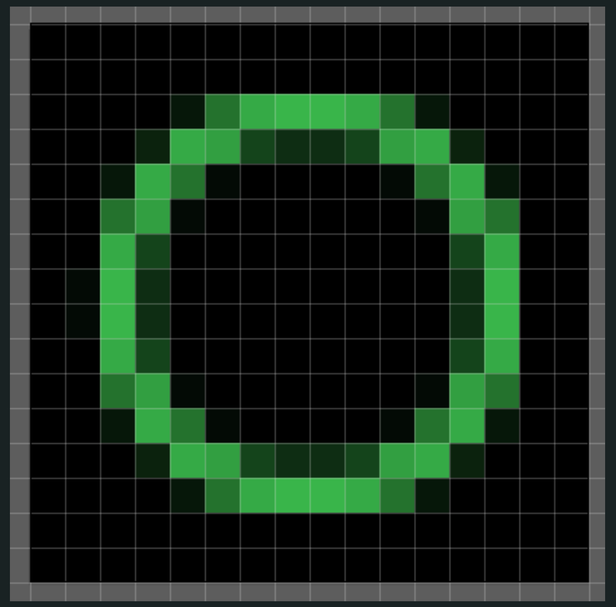


Editing Default Filters

[HOME]/Library/Application Support/Adobe/Adobe Illustrator 18/en_US/Adobe SVG Filters.svg



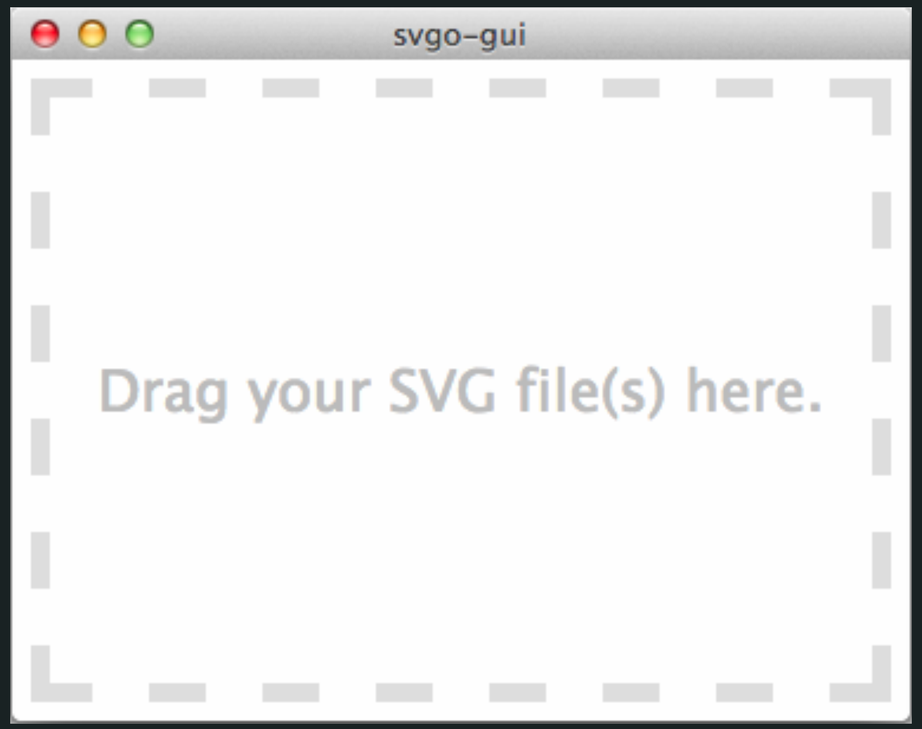
Pixel Perfect Precision



- Use pixel units, but it won't fix anything on its own
- Use *Pixel Preview* to check pixel precision accuracy,
- Position closed shapes to integer coordinates. Same for sizes.
- Apply a half pixel offset for the rest, using *Graphic Styles*
- Use *Snap to Grid*, but set up the grid to snap to integers.
- Do not align strokes to center
- **Do not use** *Align to Pixel Grid*.
- Be careful when using Ai files as Photoshop Smart Object

http://www.dehats.com/blog/contents/02-illustrator-and-pixel-precision

Optimizing SVG with SVGO-UI



Integrating SVG

SVG as...

- <img> tag src attribute
- inline SVG using <svg> tag
- CSS background-image
- <object>
- <iframe>
- <embed>
- data URI
- Canvas2d Image
- WebGL texture
- ...

Fallbacks for <img>

HTML / JS

```
<!-- Simple src rewritting using JS onerror-->
<img src="image.svg" onerror="this.src=image.png">
```

Pure JS

```
/* Using Modernizr*/
if (!Modernizr.svg) {
  $("img[src$='.svg']")
    .attr("src", fallback);
}
```

Pure HTML

```
<!-- Alexey Ten's <image> trick (issues with iOS<5 & IE)-->
<svg width="64" height="128">
  <image xlink:href="image.svg" src="fallback.png"
  width="64" height="128" />
</svg>
```

Pure JS

```
/* Using SVGeezy */
svgeezy.init(false, 'png');
```

Fallbacks for inline SVG

```
<svg></svg>
<div class="svg-alt"></div>
```

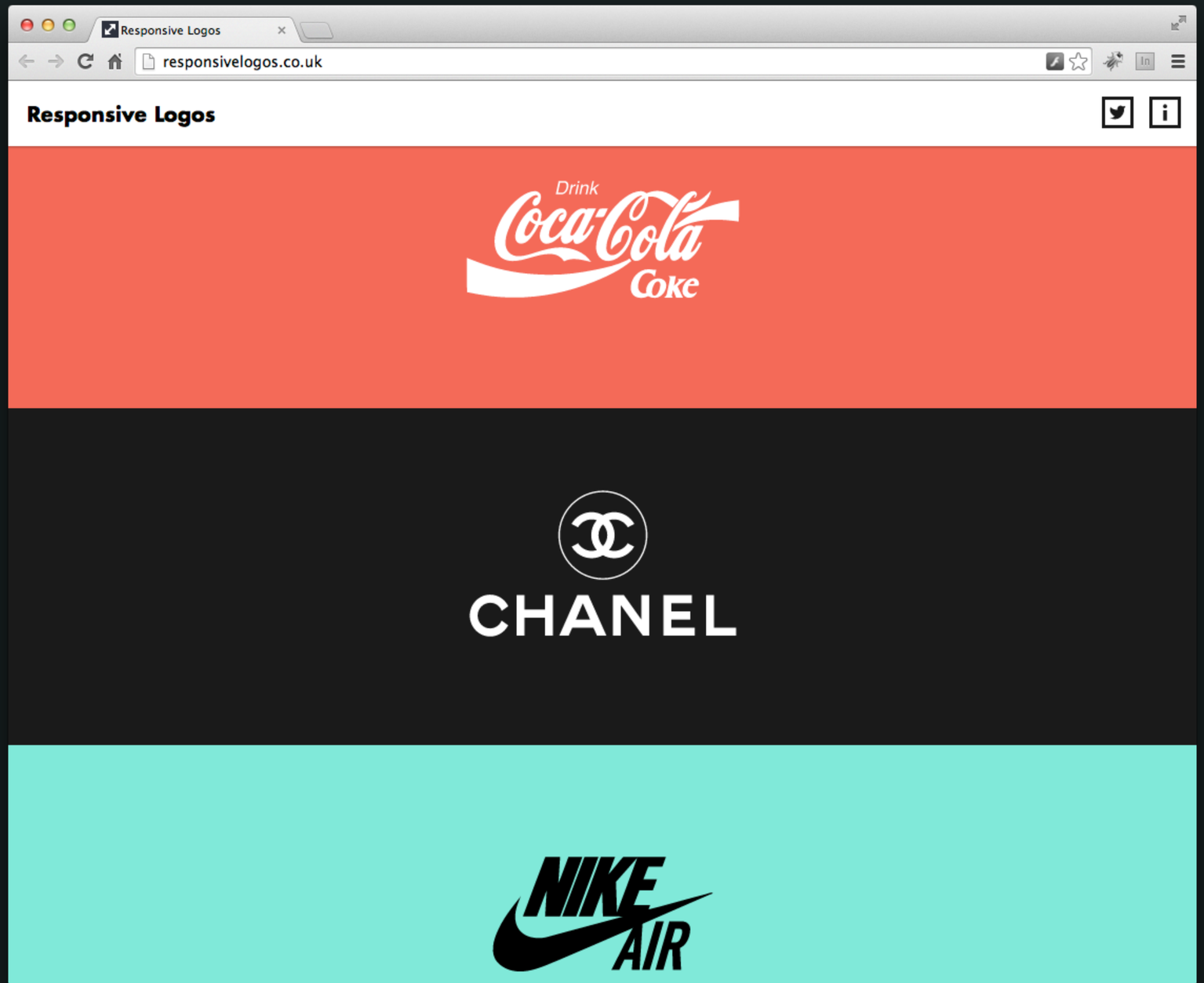
```
.svg-alt {
  display: none;
}
/* Using Modernizr */
.no-svg .svg-alt {
  display: block;
  width: 100px;
  height: 100px;
  background-image: url(image.png);
}
```

Fallbacks for background-image

```
/* Using Modernizer */
.myelement {
  background-image: url(image.svg);
}
.no-svg .myelement {
  background-image: url(fallback.png);
}
```

```
/* Using multiple background-image
(issues w/ Android 2.3-)*/
.myelement {
  background-image: url(fallback.png);
  background-image: url(image.svg), none;
}
```

Responsive SVG



Responsive SVG w/ media queries (Andreas Bovens)

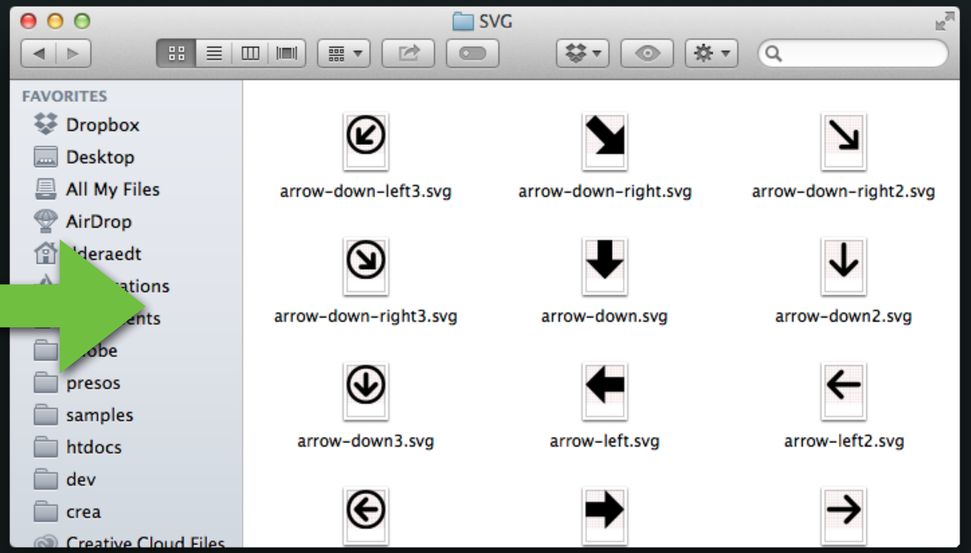
```
<svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink"
width="400" height="400">
 <g>
  <title>Simple SVG + mediaqueries</title>
  <defs>
  <style type="text/css">
    #circle {
        fill: #fce57e;
        stroke: #fff;
        stroke-width: 100px;
        stroke-opacity: 0.5;
        fill-opacity: 1;
    }
    @media screen and (max-width: 350px) {
        #circle {
            fill:  #879758;
        }
    }
    @media screen and (max-width: 200px) {
        #circle {
            fill: #3b9557;
        }
    }
    (...)

  </style>
  </defs>
  <circle cx="200" cy="200" r="150" id="circle" />
 </g>
</svg>
```

Issues with Responsive inline SVG (and iFrame)

- In IE, the height is 150px even if width is explicitly specified at 100%
- ...Resulting in white spaces above and below the image!
- Only the (ugly) **Padding Hack** solves this

http://tympanus.net/codrops/2014/08/19/making-svgs-responsive-with-css/

Spriting SVG



https://icomoon.io/

Spriting SVG

right-arrow.svg

left-arrow.svg

```svg
<svg xmlns="http://www.w3.org/2000/svg" style="display: none;">

  <symbol id="right-arrow" viewBox="214.7 0 182.6 792">
      <title>Right Arrow</title>
      <desc>Arrow heading to the right</desc>
      <!-- <path>s and whatever other shapes in here -->
  </symbol>

  <symbol id="left-icon" viewBox="0 26 100 48">
      <title>Left Arrow</title>
      <desc>Arrow heading to the left</desc>
    <!-- <path>s and whatever other shapes in here -->
  </symbol>

</svg>
```

Shapes are gathered in a single `iconset.svg` file as *symbols*
(symbols are not displayed and can be reused)

```php
<!DOCTYPE html>
<html lang="en">

<head></head>

<body>
  <?php include_once("iconset.svg"); ?>
```

Definitions are injected at the top
of the HTML page

```svg
<svg class="icon">
  <use xlink:href="#right-arrow" />
</svg>
```

Shapes are included as inline SVG
using the `<use>` tag and symbol def ID

A word about build tools

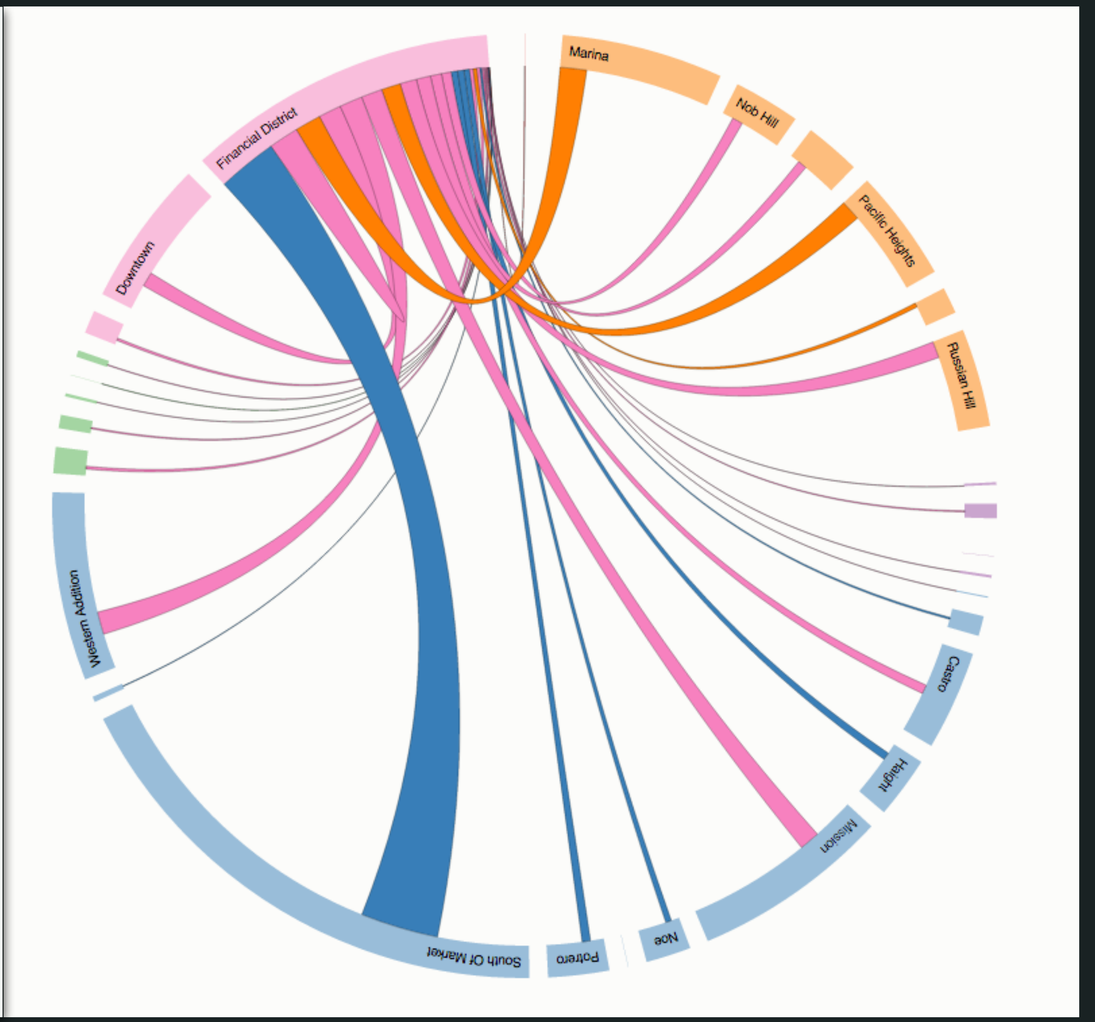
Grunt Tasks you should know about

- grunt-svgmin - optimizes SVGs using SVGO
- grunt-svg2png - rasterizes SVGs to PNG using PhantomJS
- grunticon - generates CSS w/ PNG fallbacks from SVGs
- grunt-svgstore - Merges SVGs from a folder

Code driven vectors

D3.js

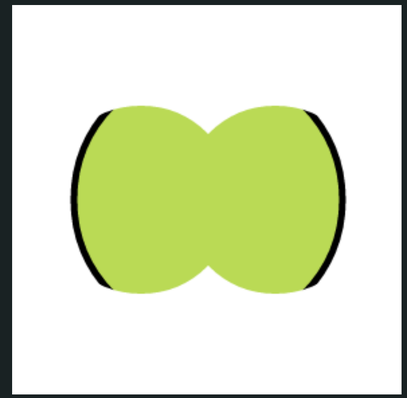
```
var svg = d3.select("body").append("svg")
    .attr("width", width)
    .attr("height", height)
  .append("g")
    .attr("id", "circle")
    .attr("transform", "translate(" + width / 2 + "," + height / 2 + ")");

svg.append("circle")
    .attr("r", outerRadius);

d3.csv("cities.csv", function(cities) {
  d3.json("matrix.json", function(matrix) {

    // Compute the chord layout.
    layout.matrix(matrix);

    // Add a group per neighborhood.
    var group = svg.selectAll(".group")
        .data(layout.groups)
      .enter().append("g")
        .attr("class", "group")
        .on("mouseover", mouseover);

    // Add a mouseover title.
    group.append("title").text(function(d, i) {
      return cities[i].name + ": " + formatPercent(d.value) + " of origins";
    });

    // Add the group arc.
    var groupPath = group.append("path")
        .attr("id", function(d, i) { return "group" + i; })
        .attr("d", arc)
        .style("fill", function(d, i) { return cities[i].color; });
```



http://bost.ocks.org/mike/uberdata/

Snap.svg

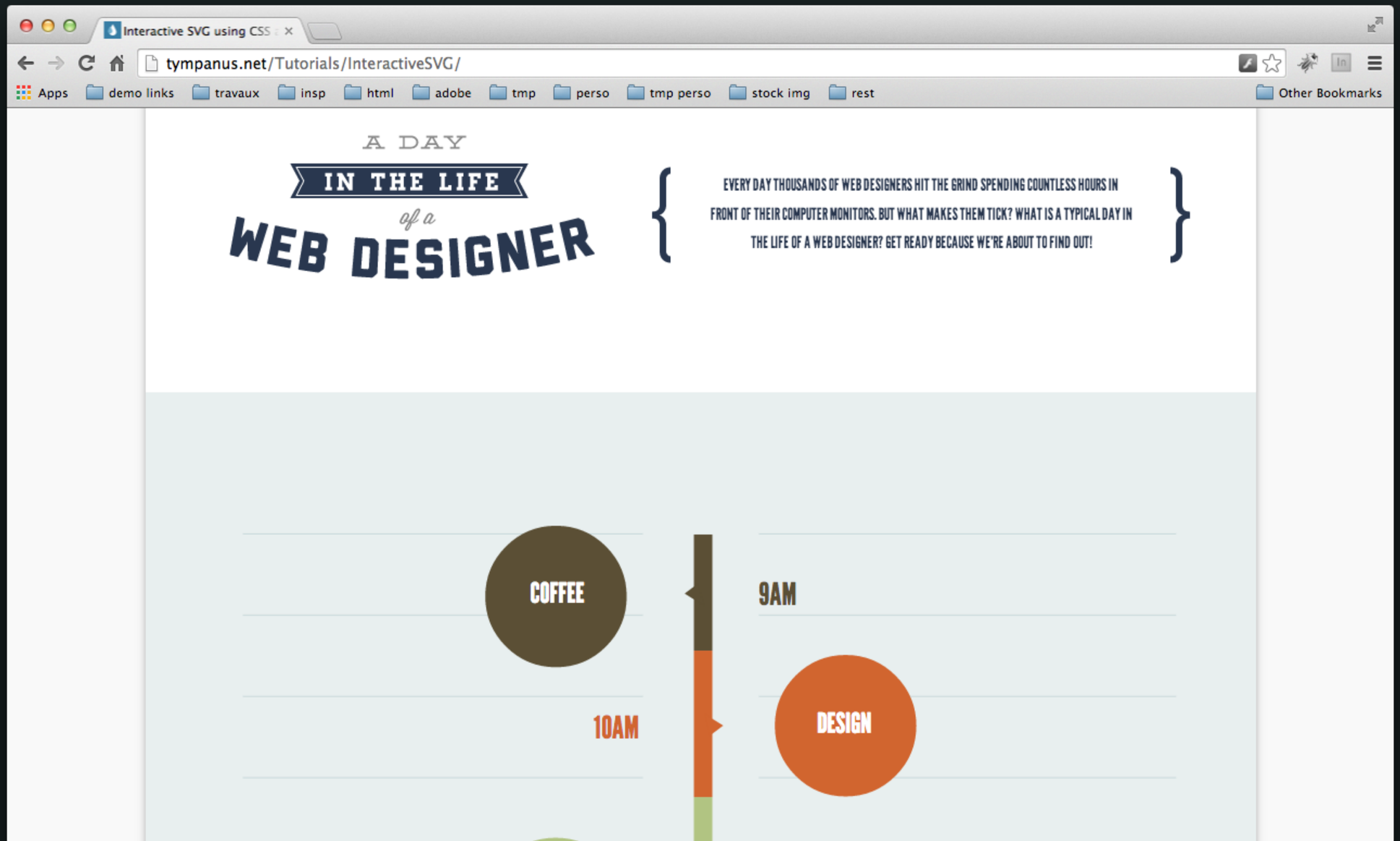
```
// First lets create our drawing surface out of existing SVG element
// If you want to create new surface just provide dimensions
// like s = Snap(800, 600);
var s = Snap("#svg");
// Lets create big circle in the middle:
var bigCircle = s.circle(150, 150, 100);
// By default its black, lets change its attributes
bigCircle.attr({
    fill: "#bada55",
    stroke: "#000",
    strokeWidth: 5
});
// Now lets create another small circle:
var smallCircle = s.circle(100, 150, 70);
// Lets put this small circle and another one into a group:
var discs = s.group(smallCircle, s.circle(200, 150, 70));
// Now we can change attributes for the whole group
discs.attr({
    fill: "#fff"
});
// Now more interesting stuff
// Lets assign this group as a mask for our big circle
bigCircle.attr({
    mask: discs
});
```



http://snapsvg.io

Animation

CSS Transitions



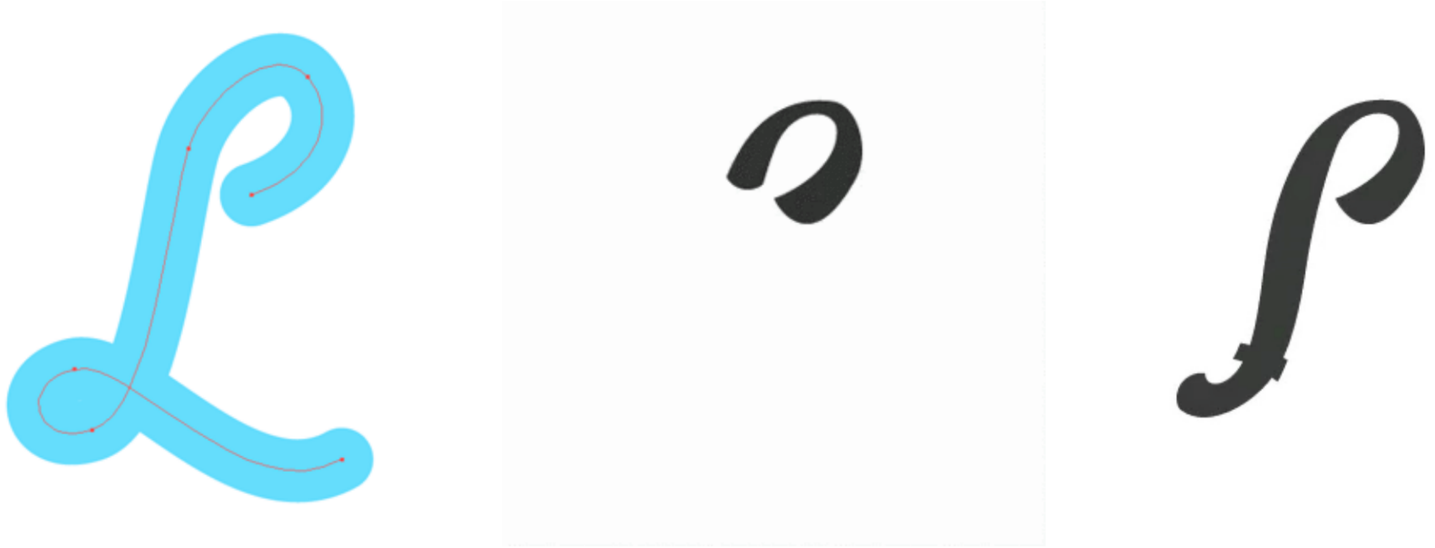
Clip Path animation

Masking SVG Animations – × How SVG Line Animation W ×

https://medium.com/@gordonnl/stylised-line-animations-ded23320ffe5

Apps demo links travaux insp html adobe tmp perso tmp perso stock img rest Other Bookmarks

To really illustrate what I mean, here is an example where, when the line crosses itself, it unintentionally reveals more of the line than we want.



If I was really peeved by this, I could simply separate the animation into two parts, avoiding the crossover altogether.

Wrap-up

Now’s the time to go ~~vector~~ SVG

CC tools are ready for the job

Go and make something great!

Thank you!

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Rich Lee

https://github.com/davidderaedt/Before-Going-Vector