

Loading images progressively

@jmperezperez

Previously on

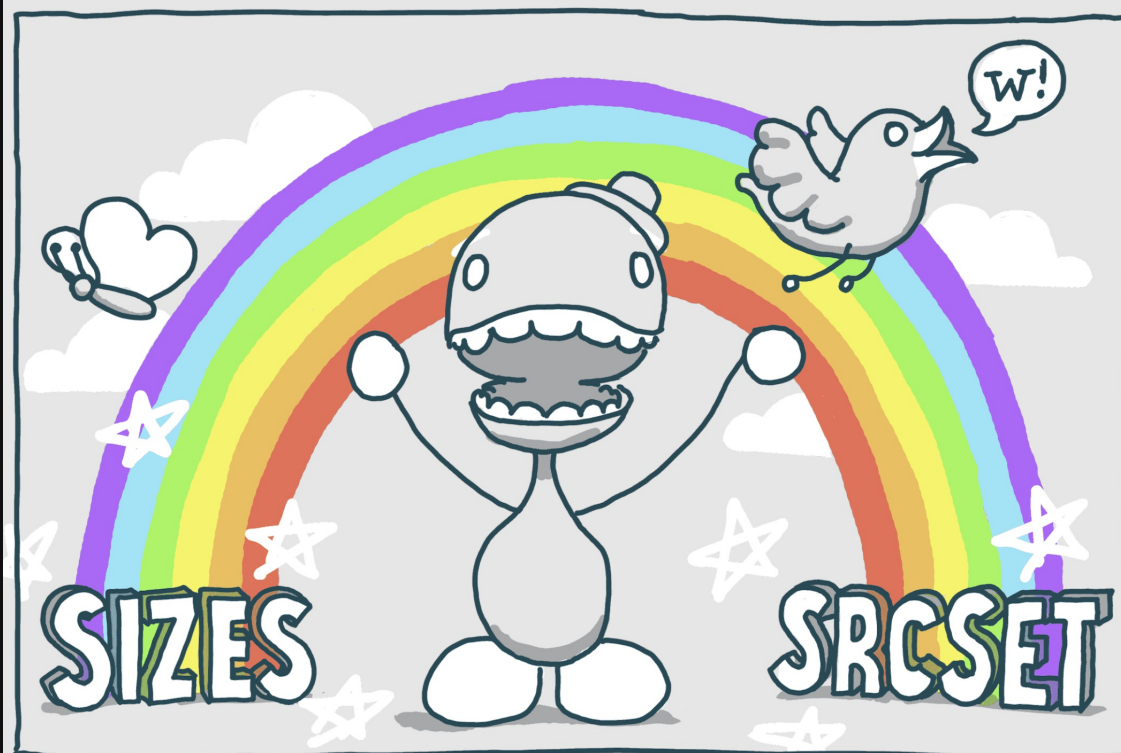
WEB PERFORMANCE
STOCKHOLM



Images, performance, and the <picture> element

Simon Pieters @zcorpan

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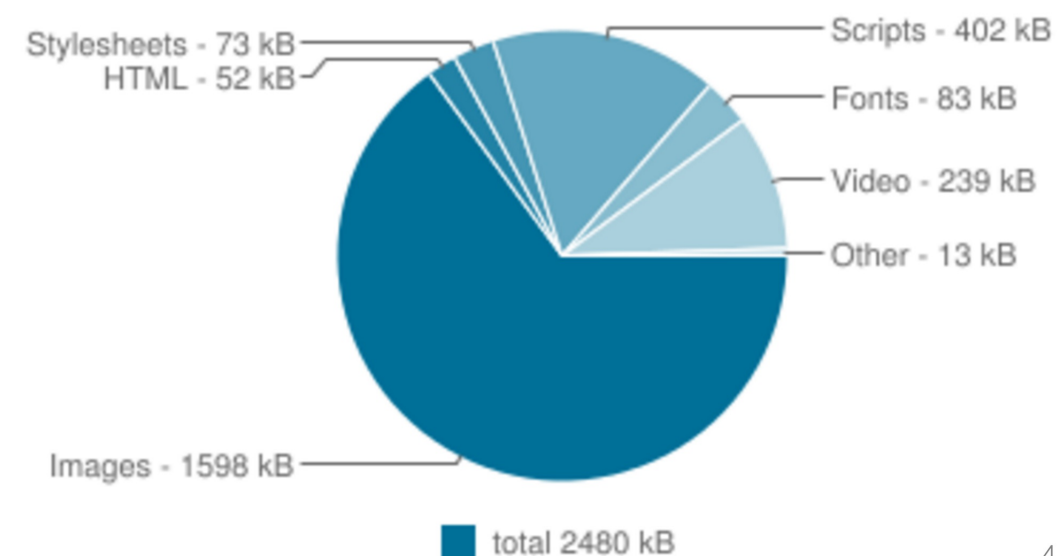


Source: <https://ericportis.com/posts/2014/srcset-sizes/>

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Images & performance

Average Bytes per Page by Content Type



4 / 47

picture & source type

```
<picture>
  <source srcset="foo.webp"
           type="image/webp">
  <source srcset="foo.jxr"
           type="image/vnd.ms-photo">
  
</picture>
```

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A photograph of a closed parking garage door. The door is made of grey concrete blocks and is partially open, revealing a dark interior. A red and blue striped barrier arm is extended across the entrance. To the right of the barrier is a yellow control box. The background shows a brick building and some trees.

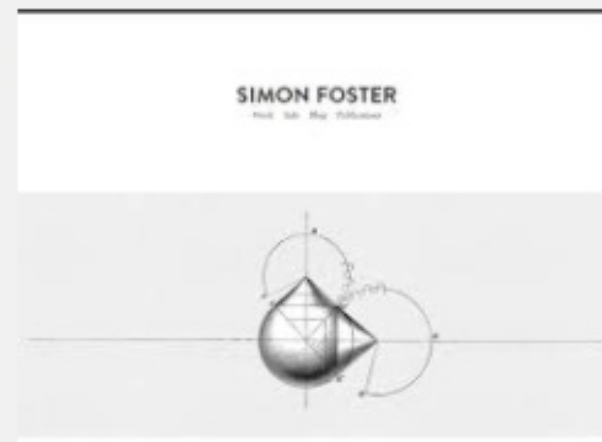
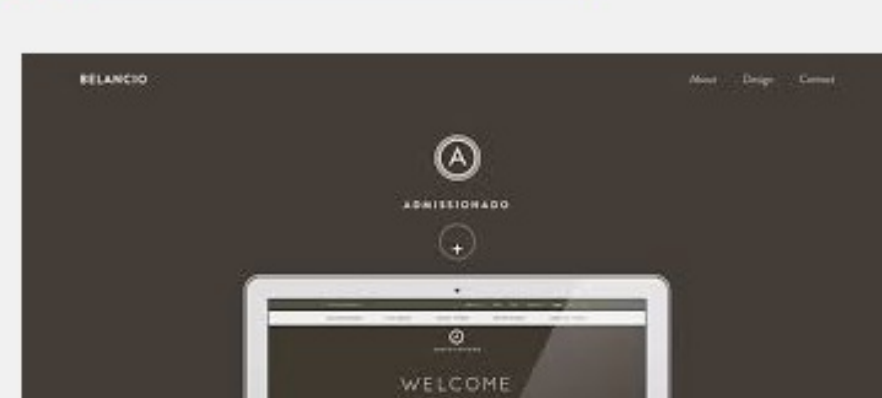
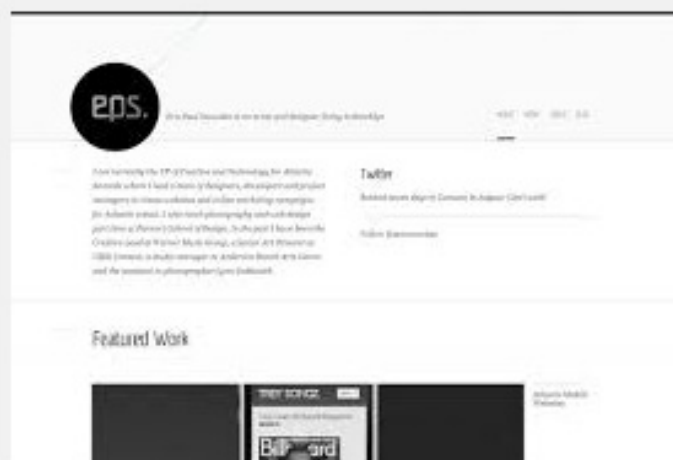
GATE, YOU HAD ONE JOB

Who am I?

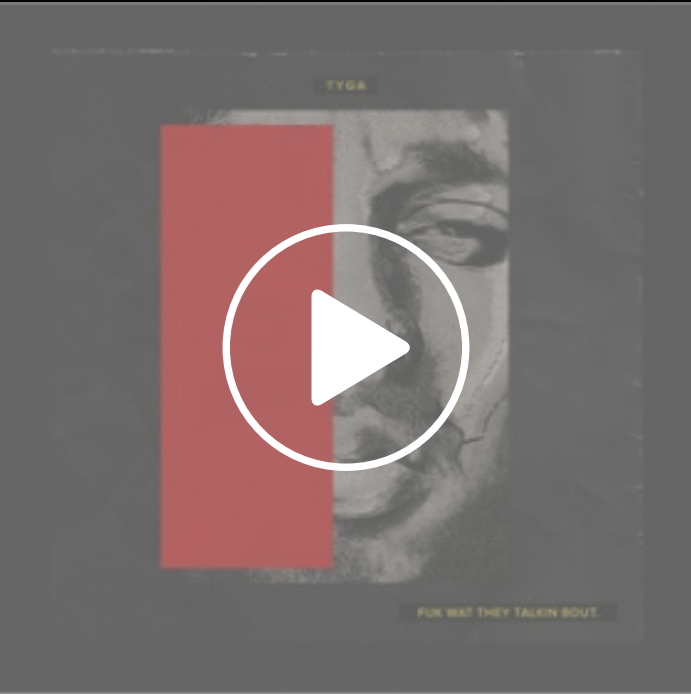
- A web developer



To use or not to use
images



We - and our partners - use cookies to deliver our services and to show you ads based on your interests. By using our website, you agree to the use of cookies as described in our [Cookie Policy](#).



Stimulated

By Tyga

2015 • 1 SONG, 3:44

PLAY ON SPOTIFY

Wrong way of hiding

```

```

```
@media (max-width: 480px) {  
  .img {  
    display: none;  
  }  
}
```

More wrong ways of hiding

```
<body>
  <div class="section-1">
    <p>This is the current section</p>
    
  </div>
  <div class="section-2 hidden">
    <p>This section might or might not be shown later</p>
    
  </div>
</body>
```

```
.hidden {
  display: none;
}
```

Optimising images





Best image format





Download
17MB PNG



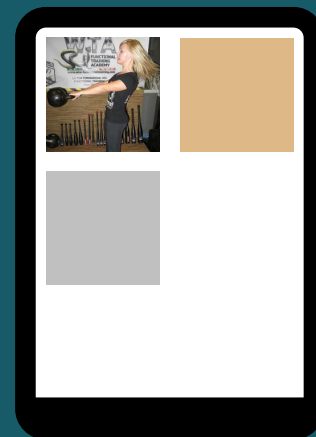


Picture element and srcset

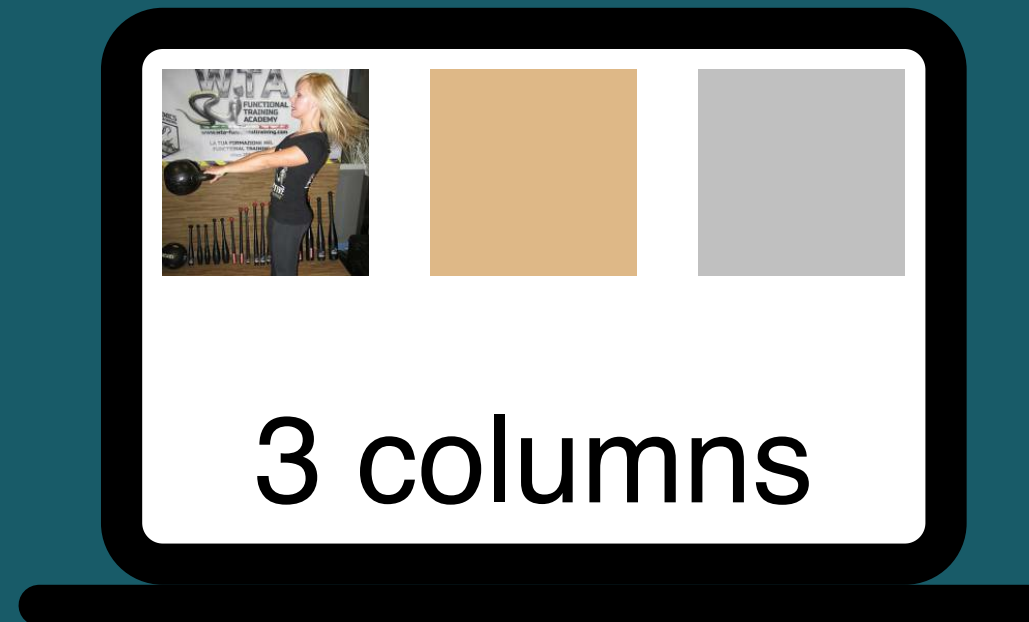
1 column



2 columns



3 columns



1st issue: Breakpoints in HTML

```

```

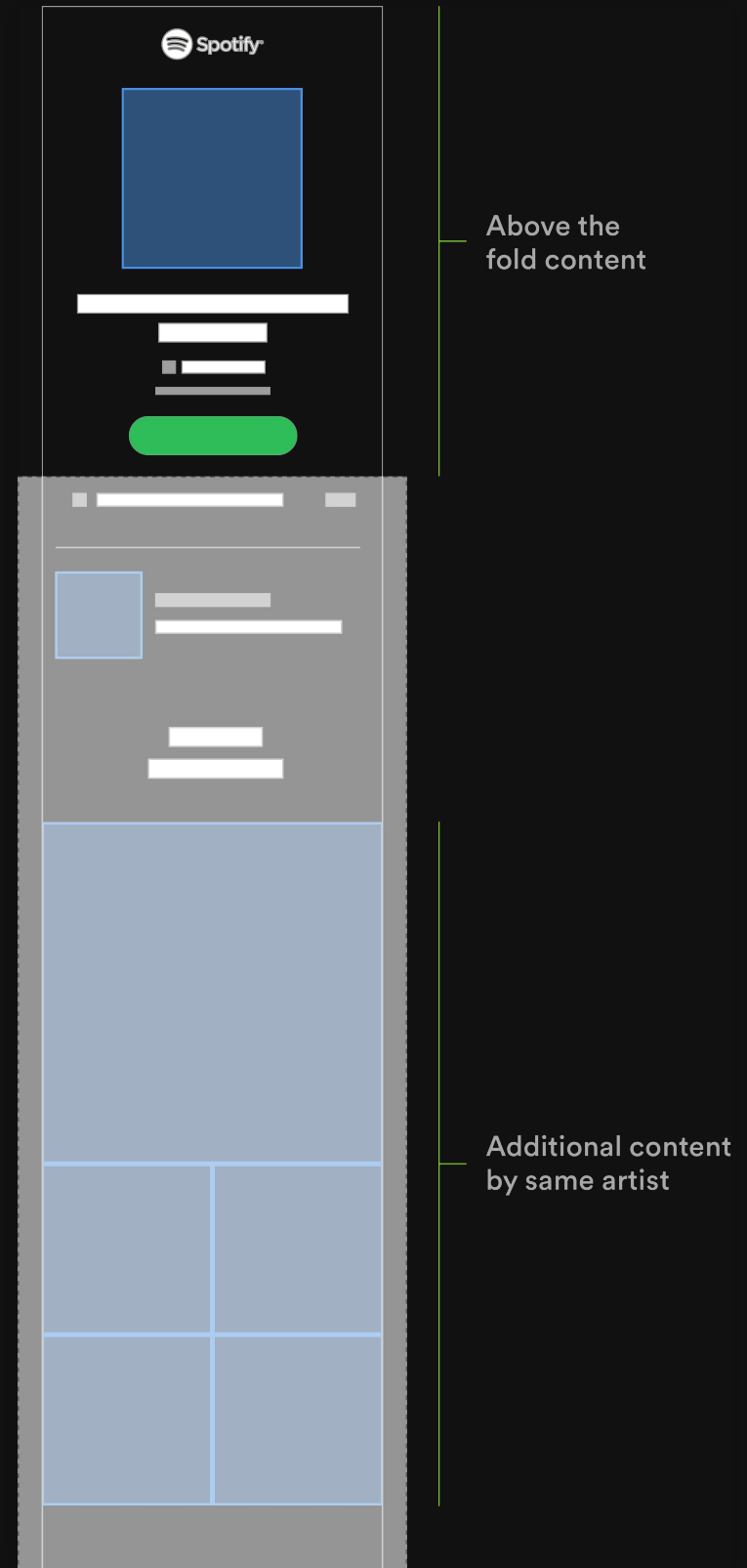

2nd issue: How do I lazy load?

Alternative

```
<div class="image-profile lazy-loaded-image"  
      data-src-600="image-600.jpg"  
      data-src-64="image-64.jpg"></div>
```

- Not coupled with layout
- Choose image based on available sizes and <div>s area
- Decide when to request it

Combine regular
images and lazy-loaded
ones



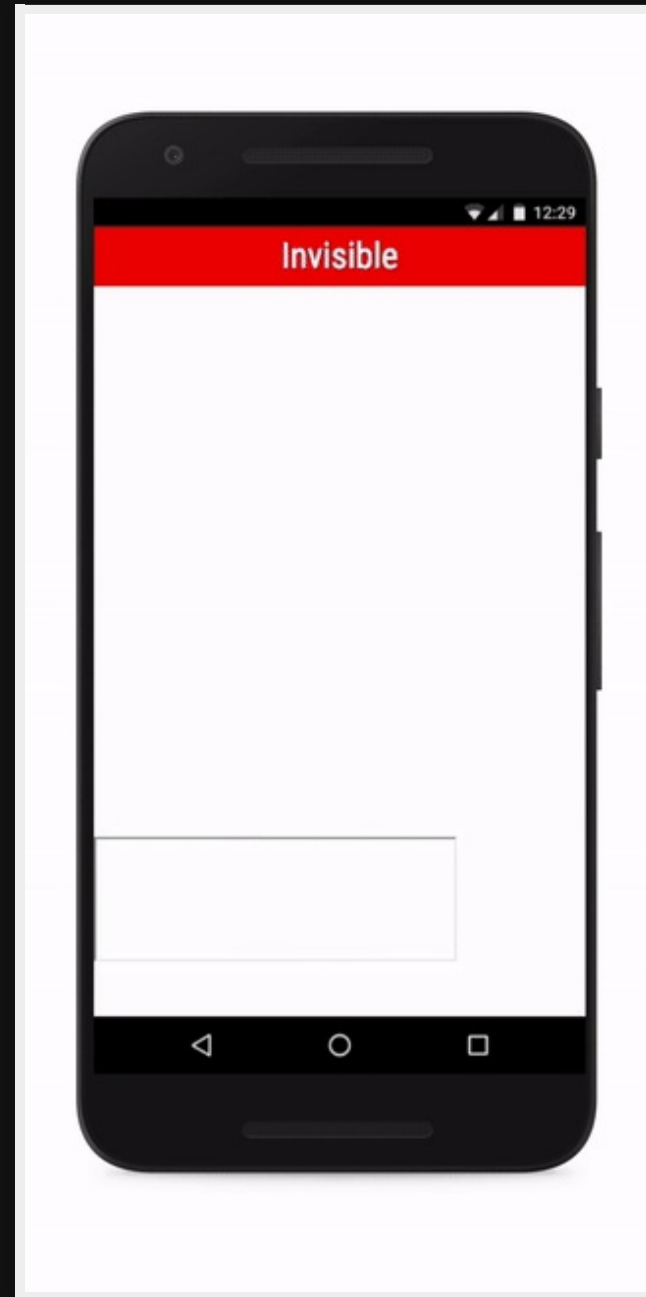
How to lazy load: Basic approach

- For all images, check whether they are in the viewport (or close enough). If they are, request it.
- Repeat this onScroll and onResize

How to lazy load: IntersectionObserver FTW

- Don't bind to the scroll event. Subscribe to an event triggered when the image enters the rendered area
- Supported in Chrome, Opera. In development in Firefox and Edge.
- Very easy to use as another strategy in your lazy loading library.

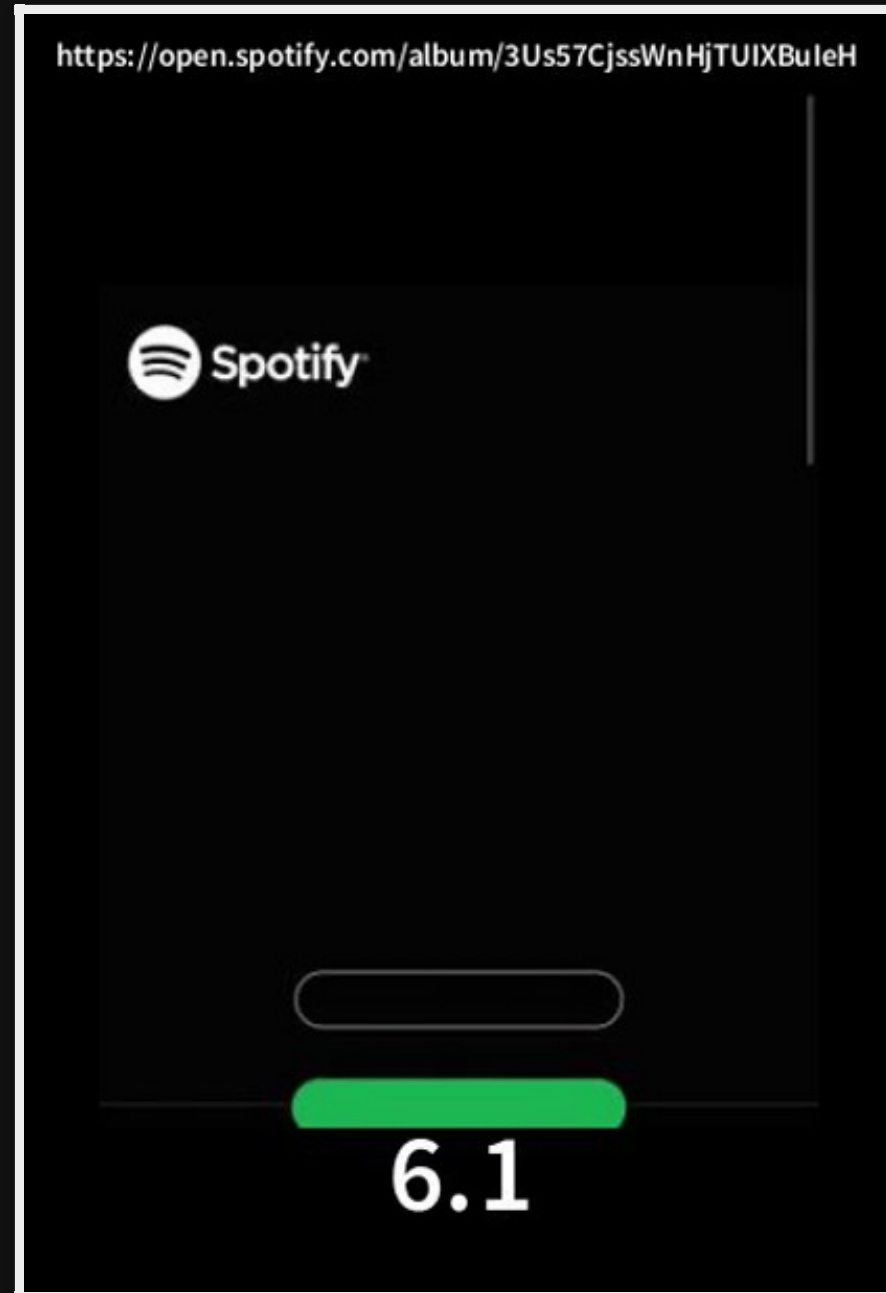
IntersectionObserver

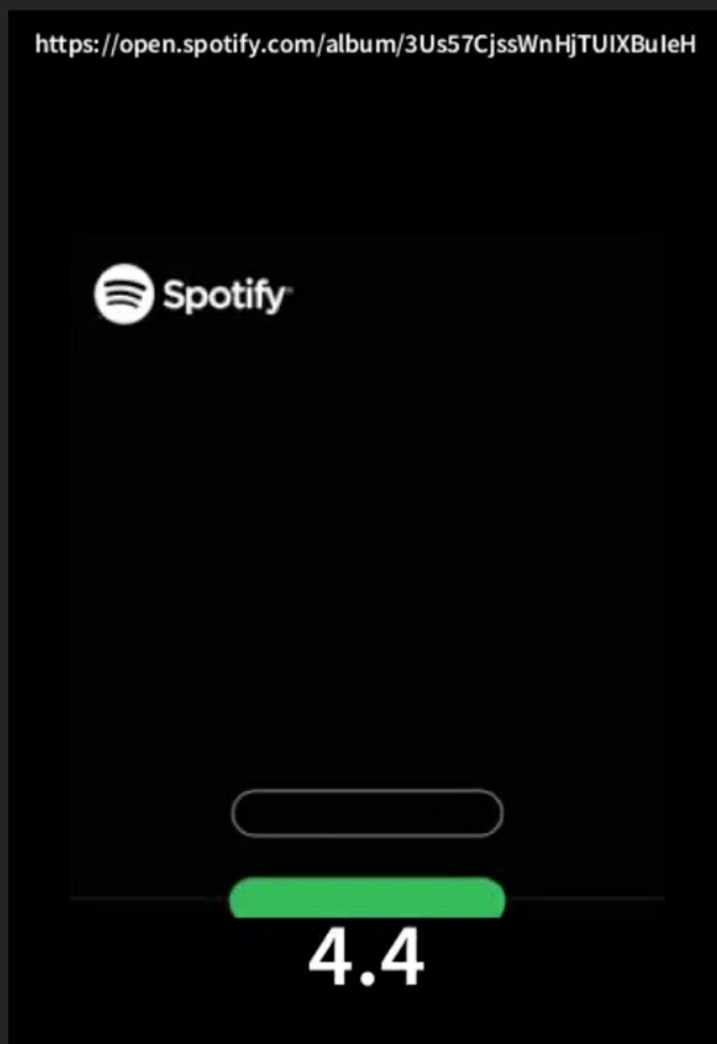




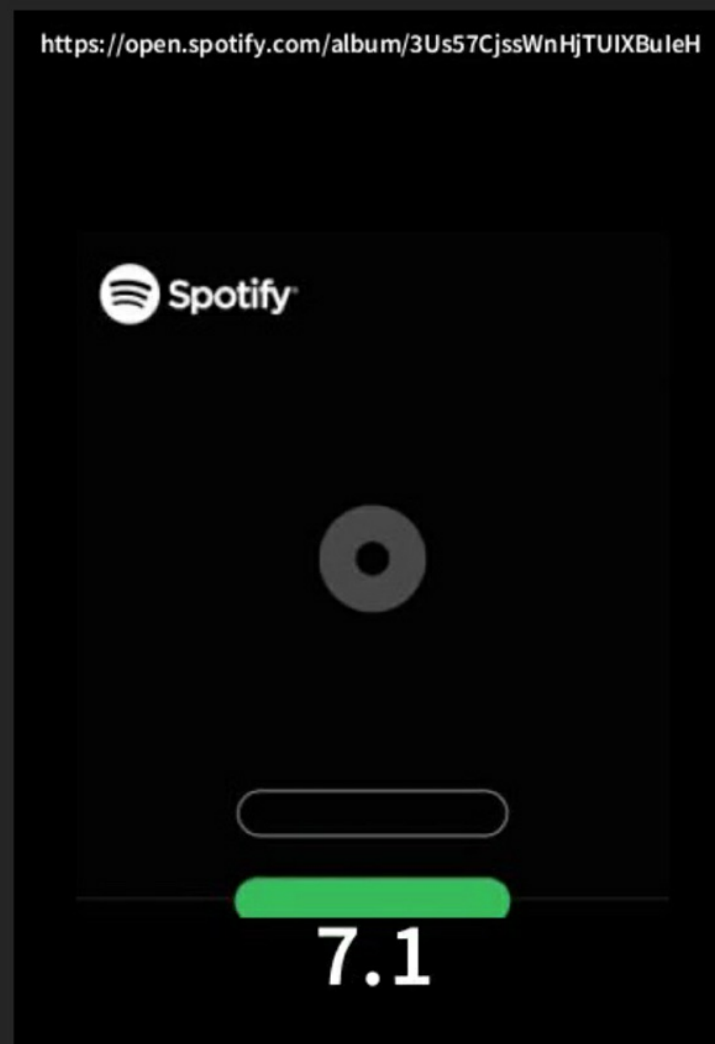
What to show while
content is loading

Example





CSS loaded

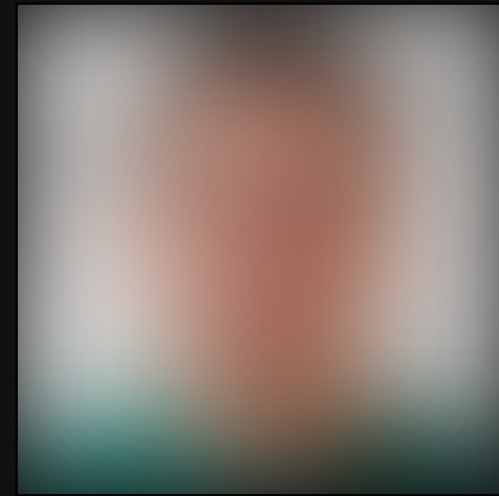
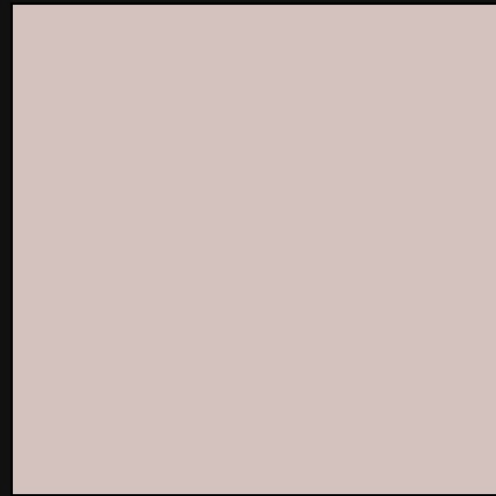
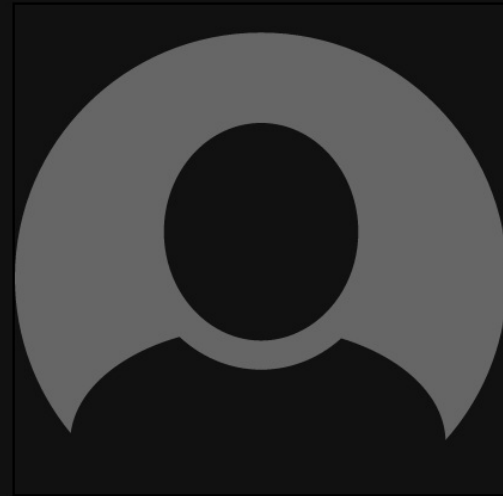


Web font loaded
(icon font)



Image loaded

Alternatives

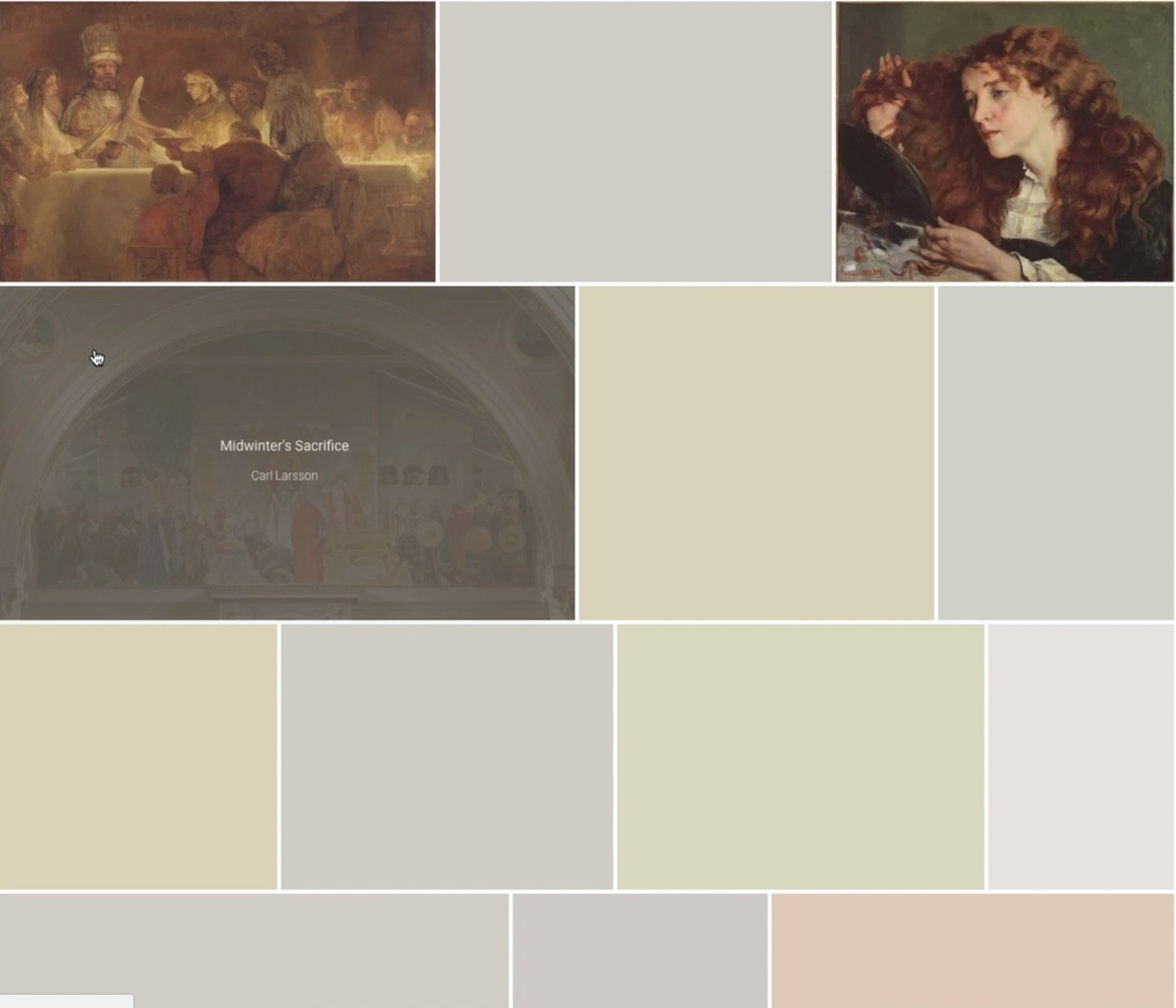


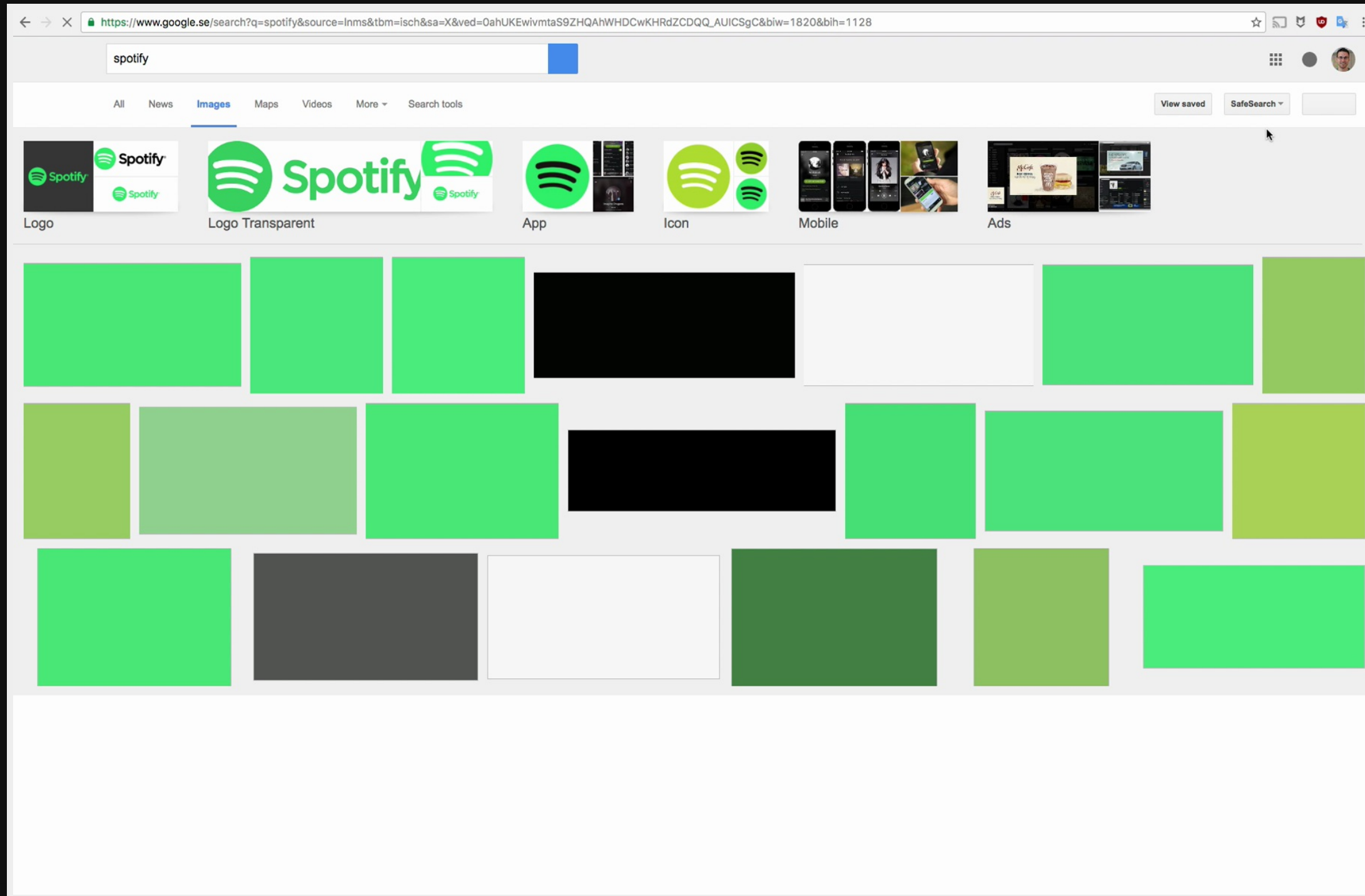
Examples of
solid color



- 🏠 Home
- 📍 Nearby
- 🏛 Partners
- 📁 Projects
- 👤 Artists
- 🖼 Mediums
- 🖌 Art Movements
- 🕒 Historical Events
- 👤 Historical Figures
- 📍 Places
- ❤ Favorites
- 📘 About
- 💬 Send feedback
- Privacy & Terms

Nationalmuseum Sweden | Paint | 63 items

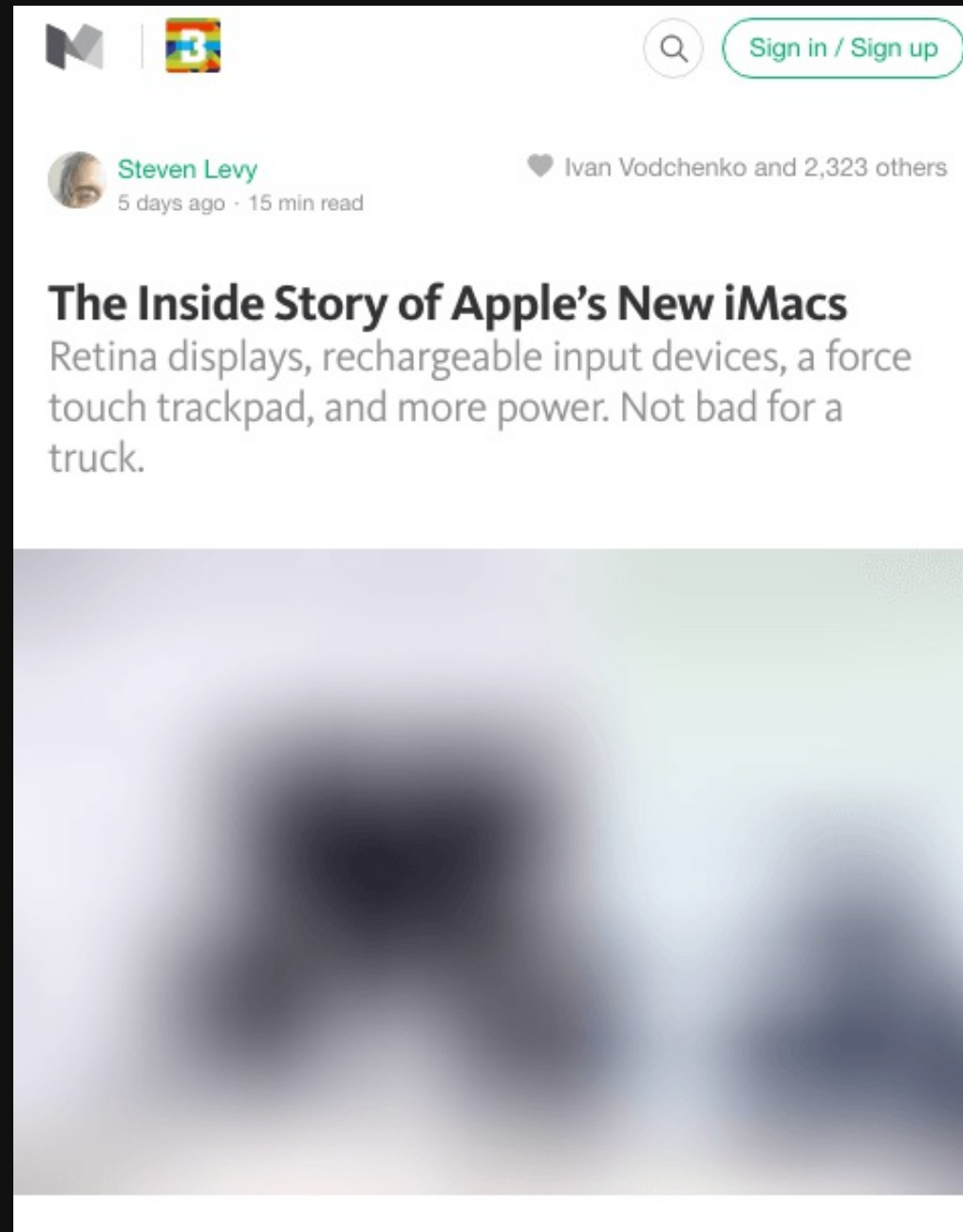




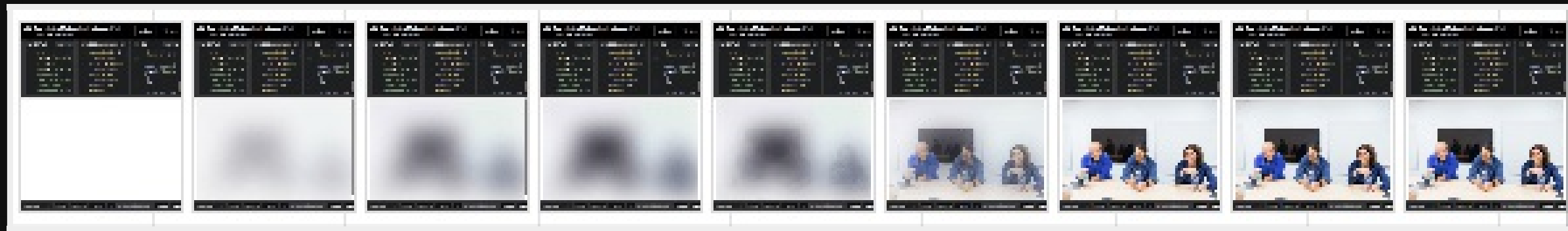
style="border:0"

Examples of Progressive Image Loading

Medium



How it's done



1. Render div
2. Load small thumbnail
3. Draw image to `<canvas/>` and apply blur effect
4. Request large image
5. Render large image and hide `<canvas/>`

Markup Overview

```
<figure>
  <div>
    <div/> <!-- this div keeps the aspect ratio so the placeholder does -->
    <img/> <!-- this is a tiny image with a resolution of e.g. ~27x17 -->
    <canvas/> <!-- takes the above image and applies a blur filter -->
    <img/> <!-- the large image to be displayed -->
    <noscript/> <!-- fallback for no JS -->
  </div>
</figure>
```

Markup Overview

```
<figure name="7012" id="7012" class="graf--figure graf--layoutFillWidth">
  <div class="aspectRatioPlaceholder is-locked">
    <div class="aspect-ratio-fill" style="padding-bottom: 66.7%;"></div>
    <div class="progressiveMedia js-progressiveMedia graf-image is-canvas">
      
      <canvas class="progressiveMedia-canvas js-progressiveMedia-canvas">
        <img class="progressiveMedia-image js-progressiveMedia-image __v" />
        <noscript class="js-progressiveMedia-inner">&lt;img class="progressiveMedia-image" />
      </noscript>
    </div>
  </div>
</figure>
```

How do users perceive it?



Jason
@lang

 Follow

Did [@Medium](#) recently add a new image loading fade-in? I noticed it this morning on mobile and just now again on web. Looks nice.

8:05 PM - 29 Feb 2016



DobaKung
@zartre

 Follow

[@Medium](#)'s articles (although full of high-res images) load up very fast *-*

3:38 AM - 28 Mar 2015



or maybe not?



Harris Rodis
@harrisrodiss

 Follow

I don't know about you but I don't like a bit those blurry (still loading...) images on Medium. Very distracting.

5:40 PM - 29 Dec 2015



James Young
@welcomebrand

 Follow

That blurry image preloading thing on Medium - is it just me or does it make all images load extremely slowly now?

10:53 AM - 5 Feb 2016



When, as with the Progressive JPEG method, image rendition is a two-stage process in which an initially coarse image snaps into sharp focus, **cognitive fluency is inhibited and the brain has to work slightly harder to make sense of what is being displayed.**

— From **Progressive image rendering: Good or evil?**

Reliable?

If you're viewing this on desktop and the above image looks a bit blurry, please refresh the page...



Damien Erambert
@Eramdam

Follow

I'm seeing this more and more on Medium posts.
Maybe the whole "blur the pictures" stuff isn't a good idea...

7:44 PM - 8 Jan 2016



Art

Art

We encourage our teams to hack our own office space, personalizing it to make them feel creative. Individuals and teams have painted words on walls, painted surfboards, framed art and t-shirts, and created posters to hang in the office. Art doesn't need to be expensive, and encouraging the creative souls in your team to personalize your office can be one of the best moves you'll make as a manager.



Sara Soueidan
@SaraSoueidan

Follow

This @Medium page is fully loaded on my slow connection. Very pretty with those stupid image effects, isn't it?

2:07 PM - 28 Nov 2015



What effect does it have on RSS Readers and bots?



Brad Dougherty

@bdougherty

 Follow

@Medium your weird blurry image thing means that when I read an article offline from my Safari Reading List, I don't get any images 😞

12:34 AM - 7 Nov 2015



1

Facebook



The technology behind preview photos

Facebook

Unfortunately, the standard JPEG header is hundreds of bytes in size. In fact, **the JPEG header alone is several times bigger than our entire 200-byte budget.** However, excluding the JPEG header, the encoded data payload itself was approaching our 200 bytes.

Facebook

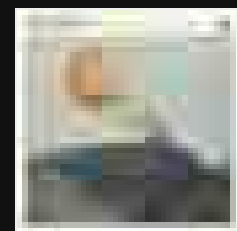
Header (mainly Quantization Table and Huffman Table)	Compressed Data
--	-----------------

Client (mobile app)

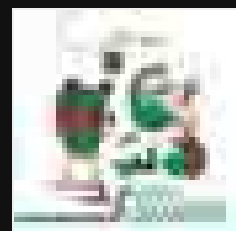
GraphQL

Generating tiny thumbnails

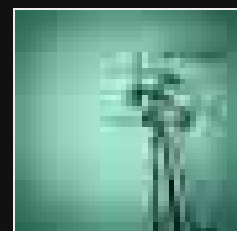
JPG



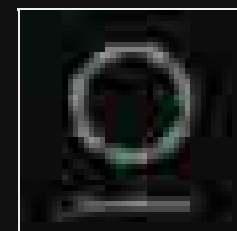
464 B



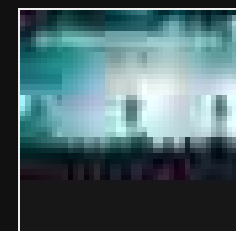
532 B



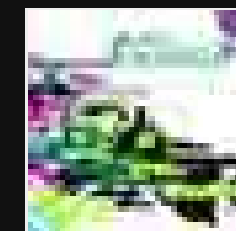
428 B



409 B

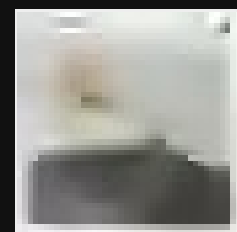


456 B

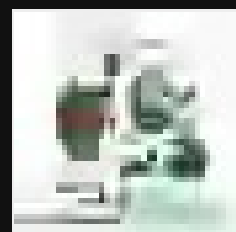


692 B

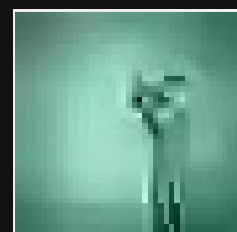
WebP



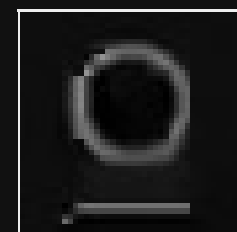
112 B



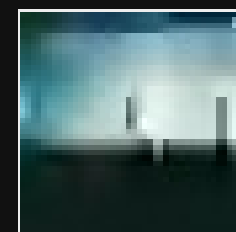
154 B



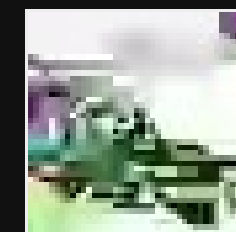
106 B



96 B



116 B



202 B

Generating tiny thumbnails

JPG



WebP



Getting creative with SVGs



Source: [polygon.com/a/ps4-review](https://www.polygon.com/a/ps4-review)

How it works

HTML

CSS

JS

Result

EDIT ON
CODEPEN

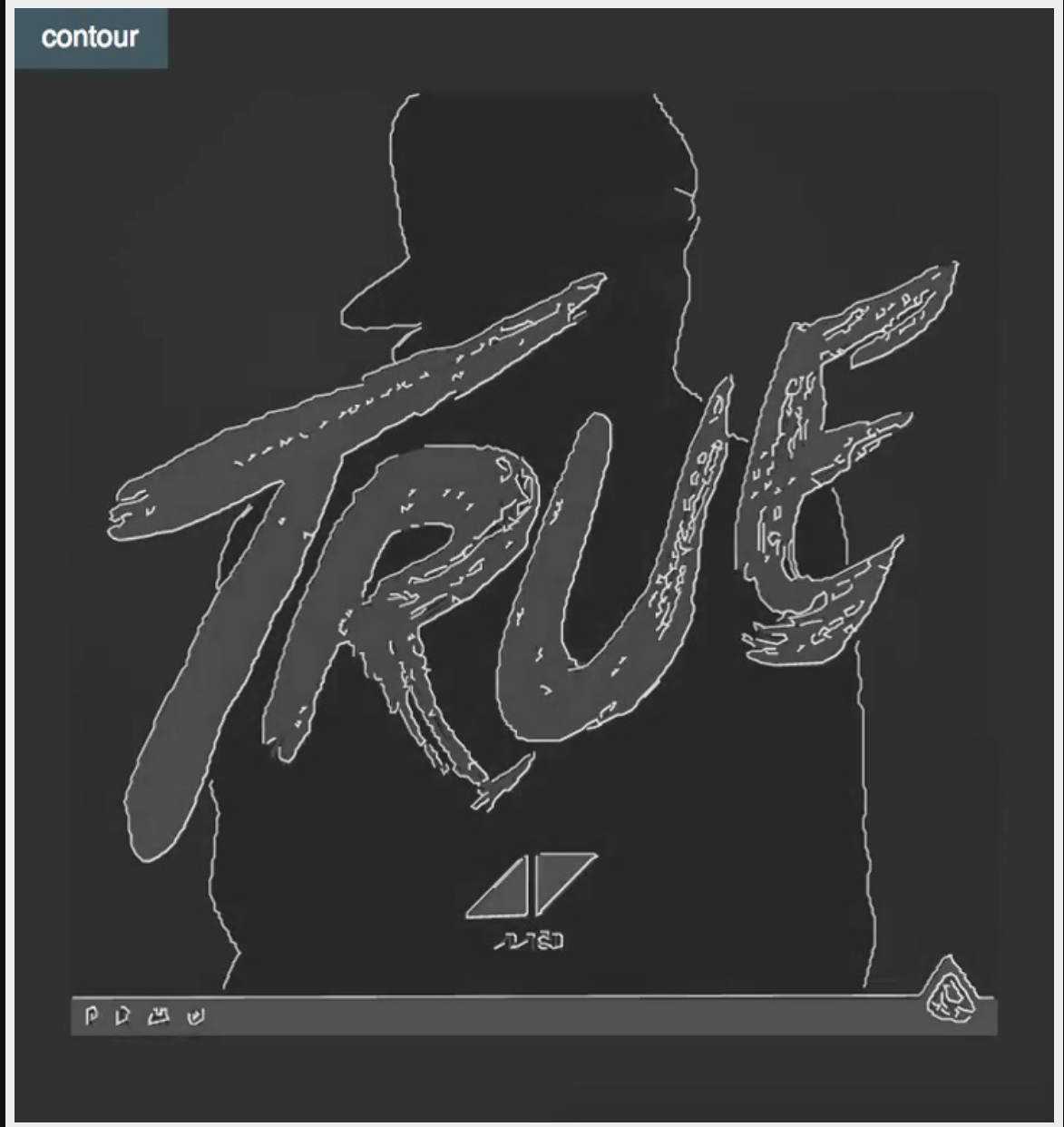
The image shows a web browser window with a dark grey header. On the left, there are four tabs: 'HTML', 'CSS', 'JS', and 'Result'. The 'Result' tab is currently selected. On the right side of the header, there is a link that says 'EDIT ON CODEPEN'. The main content area of the browser is a solid blue color. In the center of this blue area is the Spotify logo, which consists of a white circle containing three horizontal, slightly curved white lines.

Drawing bitmap images



Canny Edge Detector

Drawing bitmap images



Source: jmperezperez.com/contour

How it works

1. Find edges with canny edge detector
2. Create lines
3. Use JS and SVG to animate

```
<svg>  
  <polyline points="26,2 27,2 29,2 31,2 33,2 35,2 37,2 39,2 41,2  
  ...  
  <polyline points="88,2 89,2 91,2 93,2 95,2 97,2 99,2 101,2 103,2  
</svg>
```


Should we do this?

Just because you can it doesn't mean you should

The Web is fun.



Thanks!

@jmperezperez