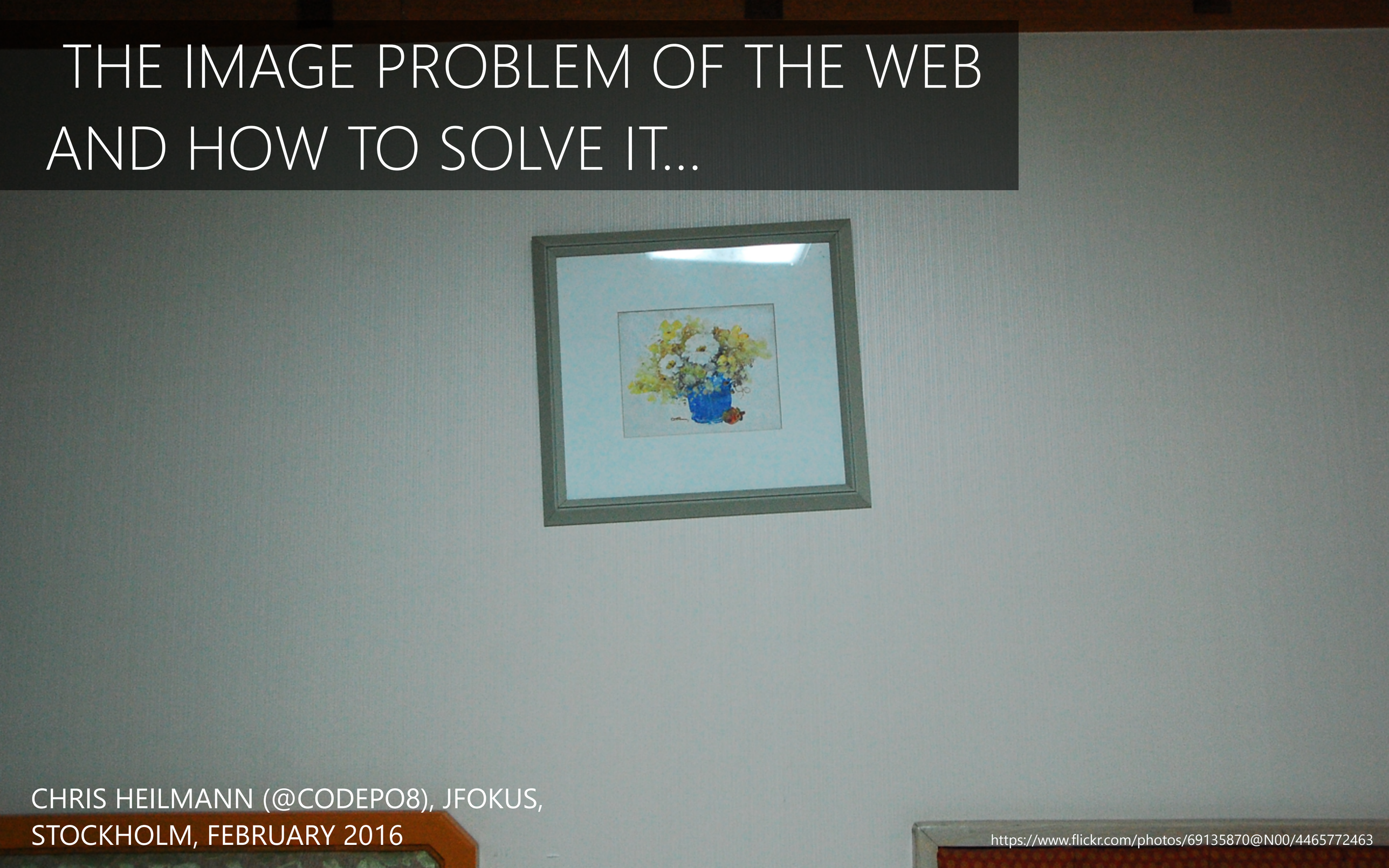
THE IMAGE PROBLEM OF THE WEB AND HOW TO SOLVE IT...



CHRIS HEILMANN (@CODEPO8), JFOKUS, STOCKHOLM, FEBRUARY 2016

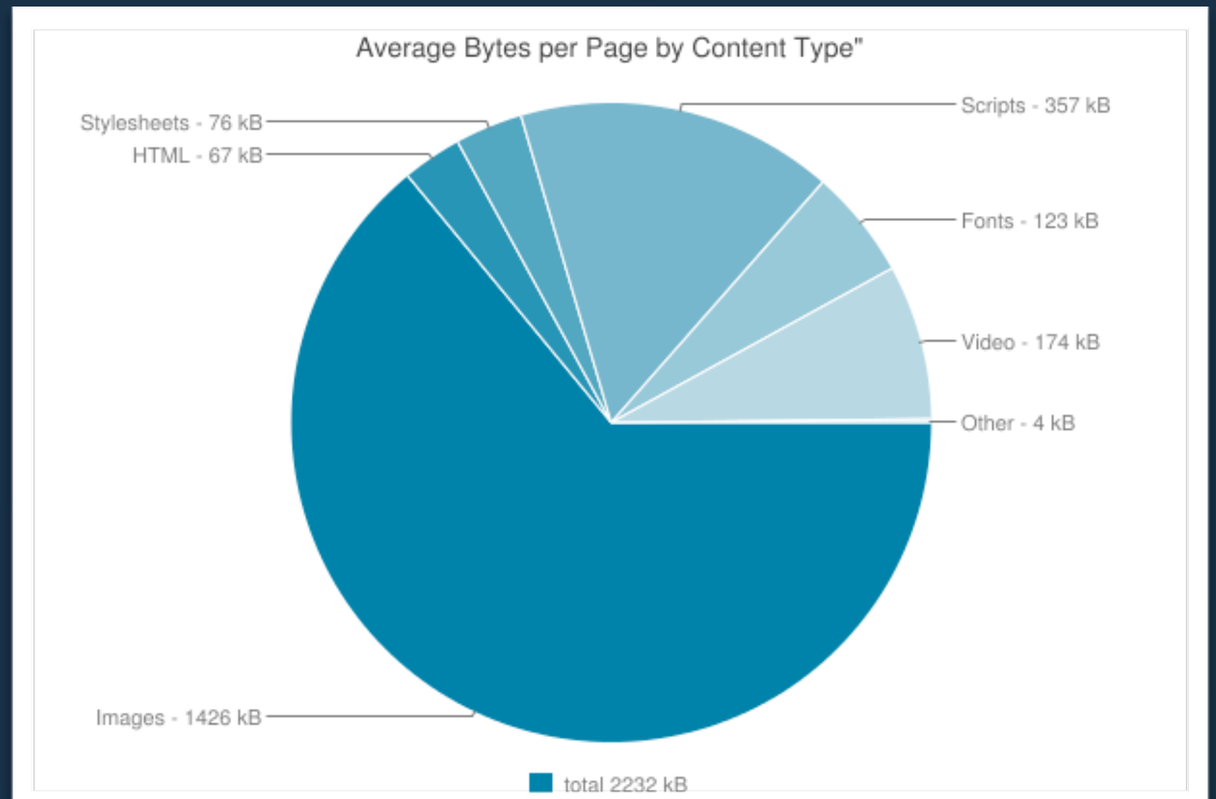
https://www.flickr.com/photos/69135870@N00/4465772463

(🖼️ × 1) > ($WORD × 1000)

THE PROBLEM IS,
THAT WE'VE
BECOME PICTURE
MAD ON THE WEB...

THE AVERAGE WEB SITE…

Type	Size (kB)
Images	1426
Scripts	357
Video	174
Fonts	123
Stylesheets	76
HTML	67
Other	4
Total	**2232 kB**



http://www.httparchive.org/interesting.php#bytesperpage

INSPIRATIONAL **OBESITY**...

WHY DID THIS HAPPEN?

MOBILE, TABLETS
GREAT HARDWARE
AND FAST
CONNECTIONS...

MAINTENANCE…

1426 KB OF **IMAGES**…

- Wrong file formats
- Delivering scaled hi-res images to everybody
- No automatic conversion and optimisation steps
- Hero image instead of text content

WE NEED TO WORK ON THIS **RIGHT NOW**...

THE WEB WORLD IS MUCH BIGGER THAN OUR ENVIRONMENT AND GROWTH HAPPENS OUTSIDE IT...

SURGICAL SOLUTIONS:
PROXY BROWSERS AND CLOUD SERVICES

https://www.flickr.com/photos/89306448@N00/334479803 {Guerrilla Futures | Jason Tester}

HERE ARE SOME THINGS **YOU CAN DO**...

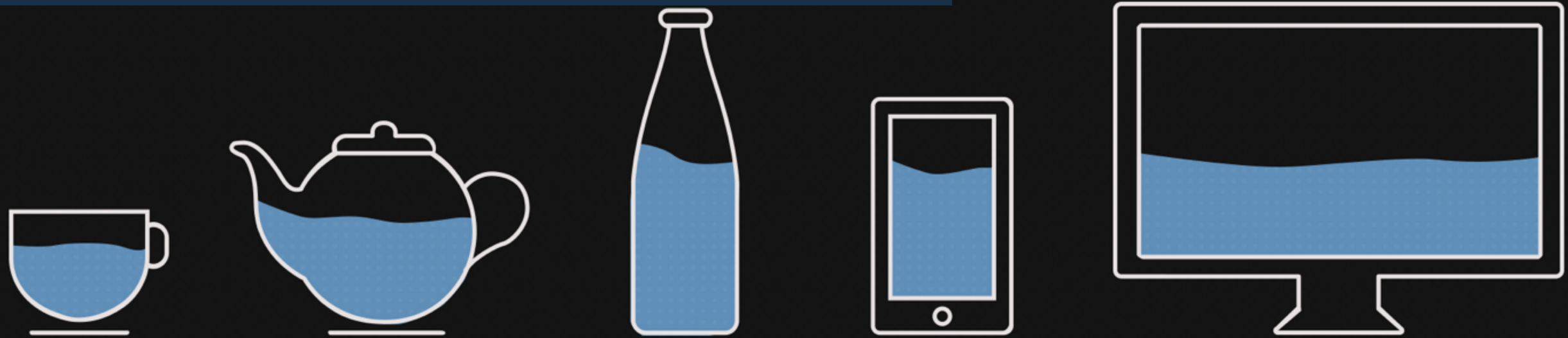
THE PROBLEMS:

- Huge images for everybody
- Unoptimised images
- No alternative content
- No training or incentive to add content in CMS

OUR ARSENAL:

- Better browsers with responsive image support
- Automated, loss-less image optimisation tools
- File level access to images to extract metadata
- Scripting solutions to offer alternative content
- Cloud services with machine learning APIs for intelligent resizing
- Machine learning for tagging

BETTER BROWSERS WITH **RESPONSIVE IMAGE SUPPORT**



> You put water into a cup it becomes the cup.
> You put water into a bottle it becomes the bottle.
> You put it in a teapot, it becomes the teapot.

Josh Clark *(originally Bruce Lee)* - Seven deadly mobile myths

Illustration by Stéphanie Walter

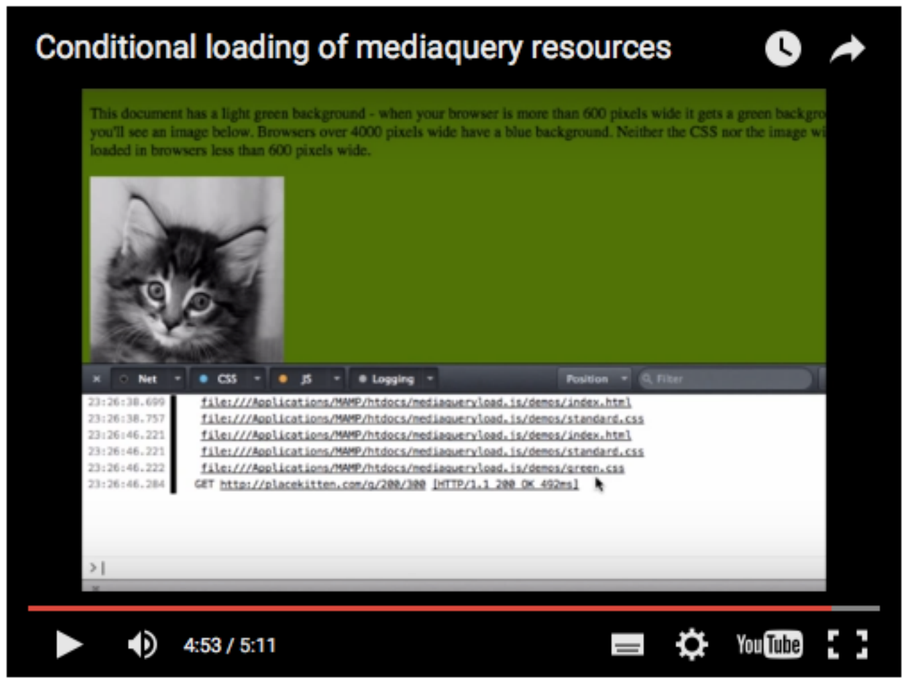
MEDIA QUERIES LOAD EVERYTHING 😦

https://www.christianheilmann.com/2012/12/19/conditional-loading-of-resources-with-mediaqueries/

CONDITIONAL LOADING OF RESOURCES WITH MEDIAQUERIES

Wednesday, December 19th, 2012 at 12:51 am

Here is a quick idea about making mediaqueries not only apply styles according to certain criteria being met, but also loading the resources needed on demand. You can check a quick and dirty screencast with the idea or just read on.



Mediaqueries are very, very useful things. They allow us to react to the screen

CHRISTIAN HEILMANN

For a better web with more professional jobs – can talk, will travel

Search the archives:

Search

HOME

ABOUT THIS

ARCHIVES

MY BOOKS

WHERE'S CHRIS? – UPCOMING SPEAKING APPOINTMENTS

VIDEOS

BROWSERS CHANGED A LOT.

EVERGREEN, CAPABLE AND OPEN!

THIS IS A GREAT TIME TO **CHANGE OUR WAYS**!

PICTURE ELEMENT AND SRCSET...

HOORAY FOR SUPPORT!

Can I use picture ? Settings

1 result found

Picture element - LS

Global 56.27%

A responsive images method to control which image resource a user agent presents to a user, based on resolution, media query and/or support for a particular image format

Current aligned | Usage relative | Show all

IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
8			45					4.3	
9			46					4.4	
10		43	47			8.4		4.4.4	
11	13	44	48	9	34	9.2	8	47	47
	14	45	49	9.1	35	9.3			
		46	50		36				
		47	51						

IN DEPTH INFO...

https://jakearchibald.com/2015/anatomy-of-responsive-images/

Jake Archibald wrote...

The anatomy of responsive images

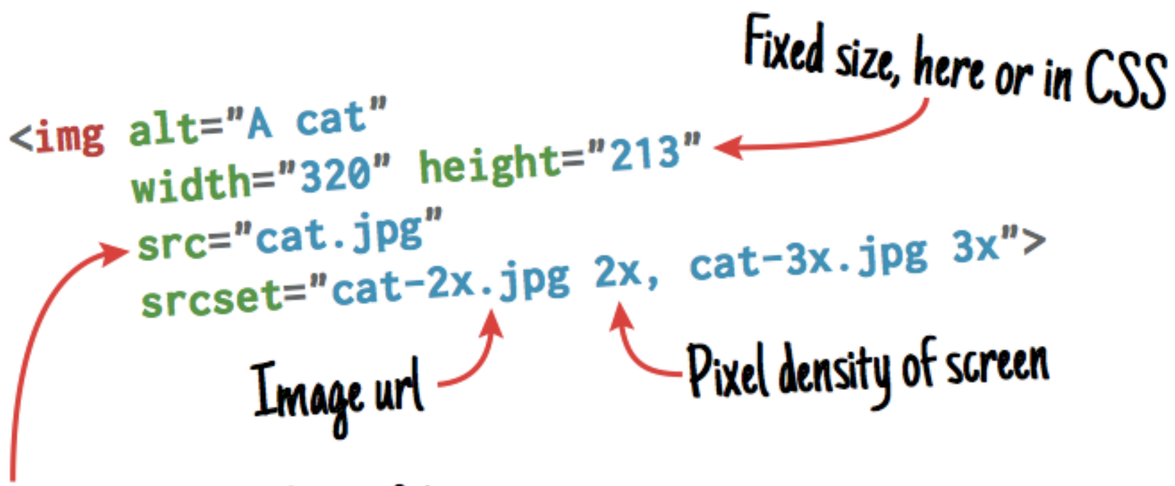
Posted 03 September 2015

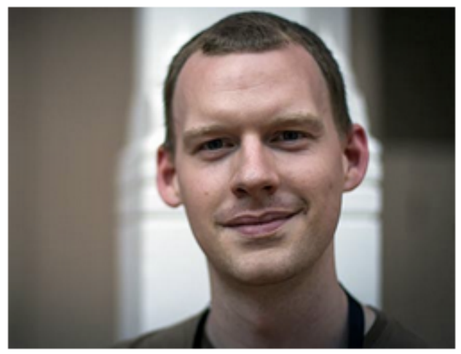
I just had my responsive images epiphany and I'm writing it all down before I forget everything.

This is what I know…

Fixed size, varying density

If your image is a fixed size in pixels, but you want to cater for screens of different density, here's the solution:





Hello, I'm Jake and that is my face. I'm a developer advocate for Google Chrome.

Elsewhere

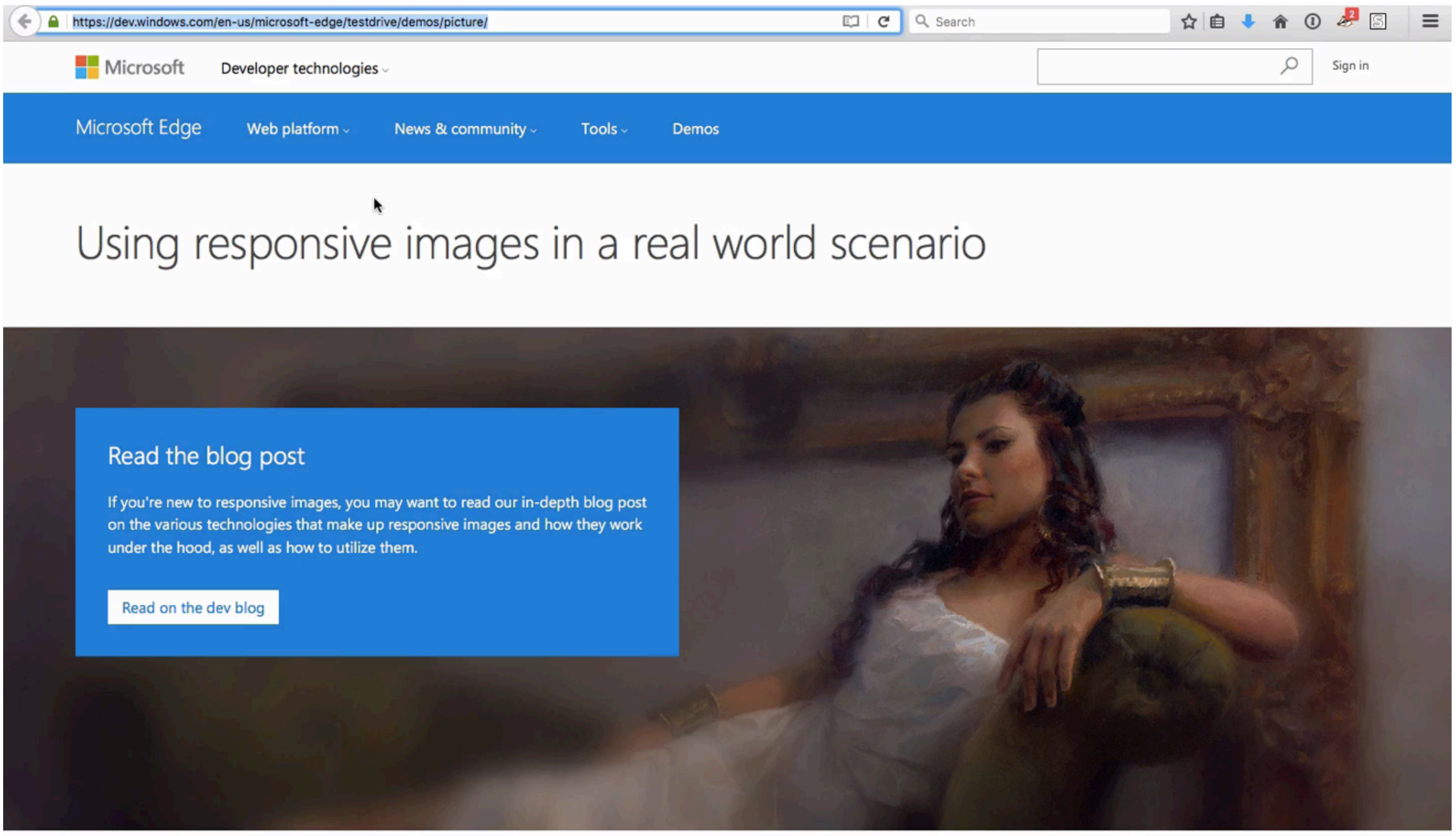
Twitter Google+
Lanyrd Flickr
Github

Contact

Feel free to throw me an email, unless you're a recruiter, in which case destroy every email-capable device you own to prevent this possibility.

LIVE DEMO…

https://dev.windows.com/en-us/microsoft-edge/testdrive/demos/picture/



HOORAY WORDPRESS!

https://www.smashingmagazine.com/2015/12/responsive-images-in-wordpress-core/

Responsive Images Now Landed In WordPress Core

By Tim Evko

December 24th, 2015

Responsive Web Design, Techniques (WP), Images

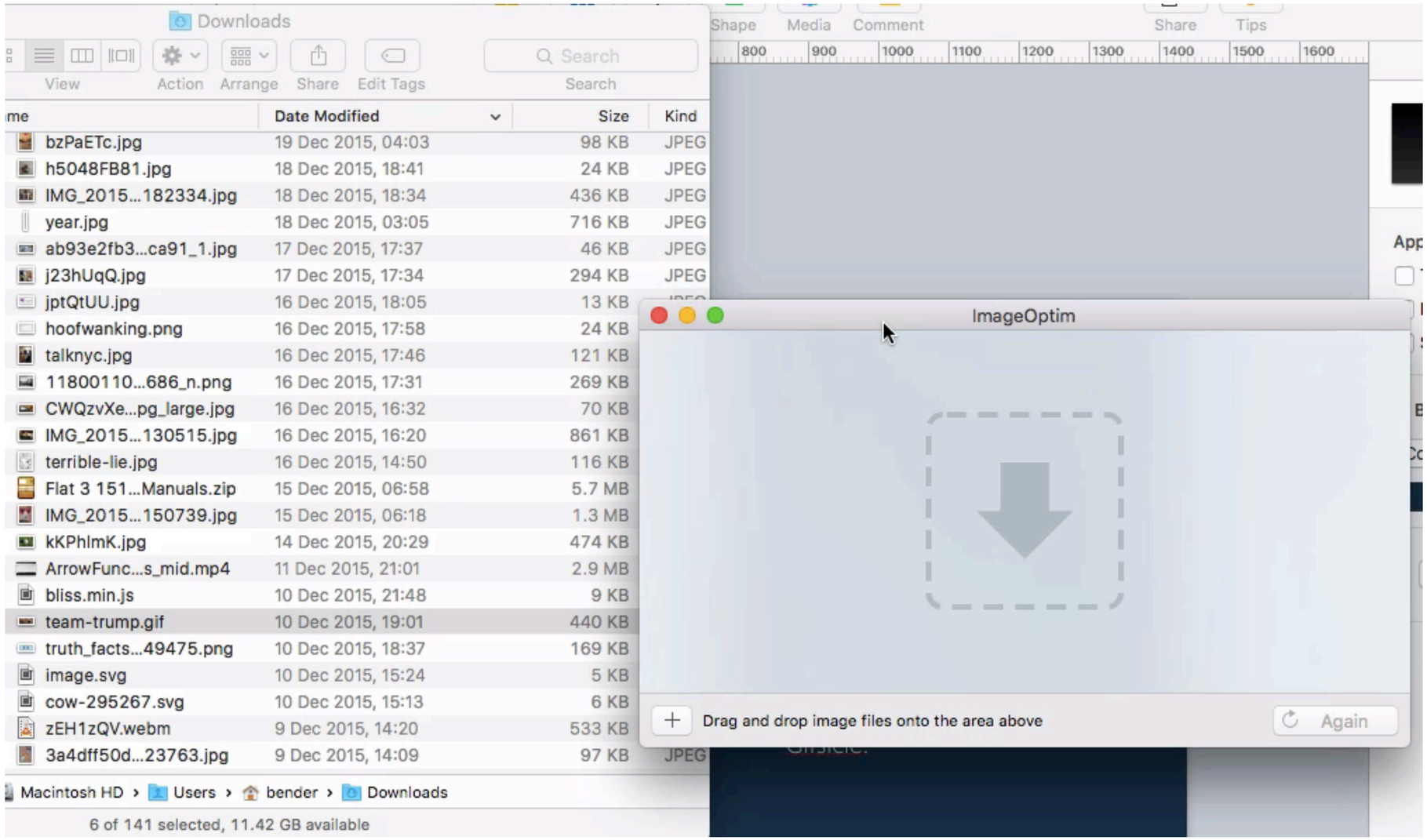
15 Comments

While the growing adoption of responsive images cannot be ignored, it can be very **difficult to employ the functionality under the constraints of a large CMS** like WordPress. Although it is entirely possible to write the feature into your theme on your own, doing so is a challenging and time-consuming endeavour.

AUTOMATED TOOLS FOR
LOSSLESS IMAGE OPTIMISATION

IMAGEOPTIM…

https://imageoptim.com/



PNGOUT, Zopfli, Pngcrush, AdvPNG, extended OptiPNG, JpegOptim, MozJPEG (jpegtran & jpegrescan), Gifsicle.

FILE LEVEL ACCESS ON IMAGES TO **EXTRACT METADATA**

EXIF - THE HIDDEN GEMS

http://code.flickr.net/2012/06/01/parsing-exif-client-side-using-javascript-2/

Posted on June 1, 2012 by cberry

← Previous Next →

Parsing Exif client-side using JavaScript

What is Exif? A short primer.

Exif is short for Exchangeable image file format. A standard that specifies the formats to be used in images, sounds, and tags used by digital still cameras. In this case we are concerned with the tags standard and how it is used in still images.

How Flickr currently parses Exif data.

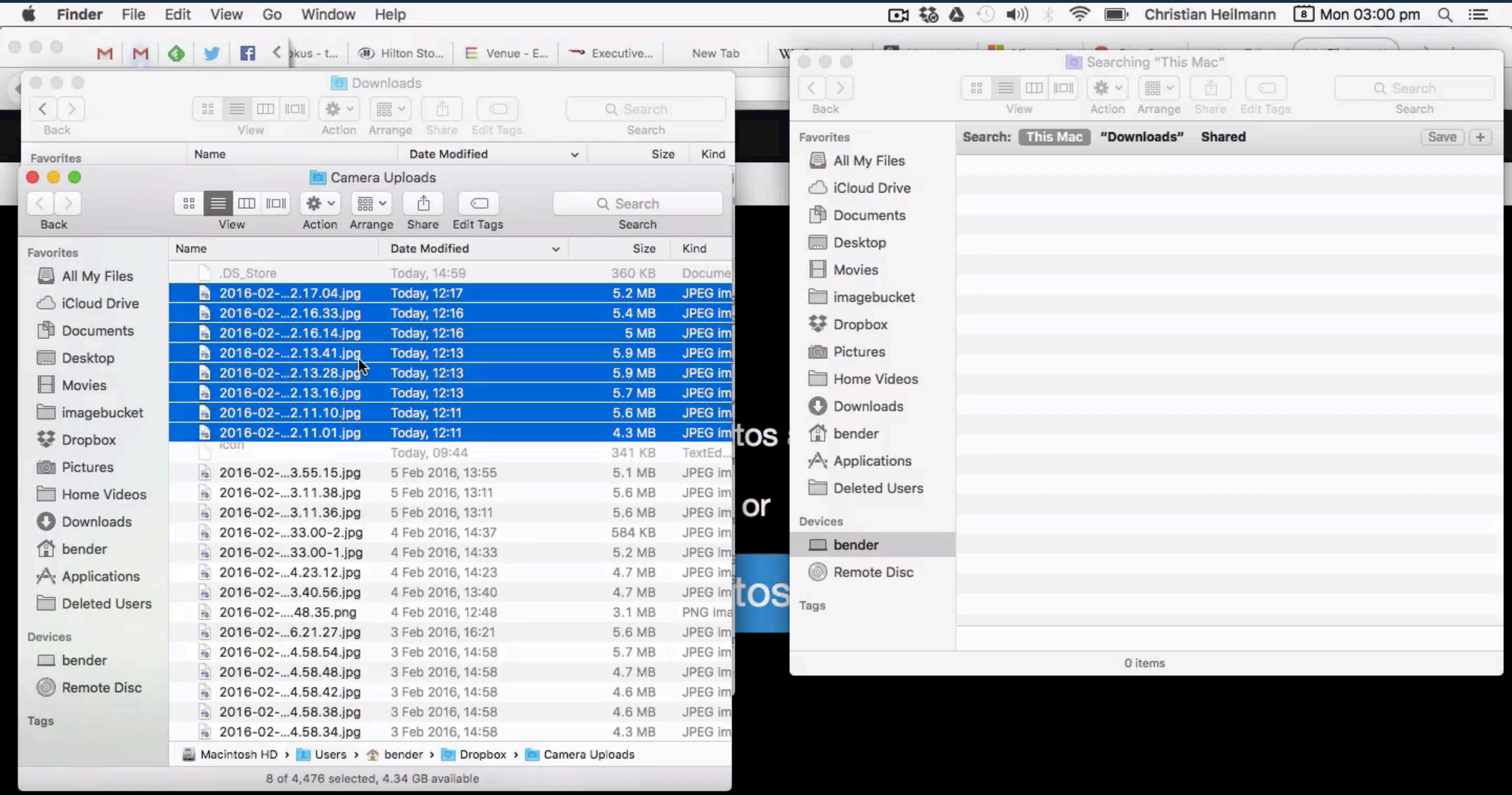
Currently we parse an image's Exif data after it is uploaded to the Flickr servers and then expose that data on the photo's metadata page (http://www.flickr.com/photos/rubixdead/7192796744/meta/in/photostream). This page will show you all the data recorded from your camera when a photo was taken, the camera type, lens, aperture, exposure settings, etc. We currently use ExifTool (http://www.sno.phy.queensu.ca/~phil/exiftool/) to parse all of this data, which is a robust, albeit server side only, solution.

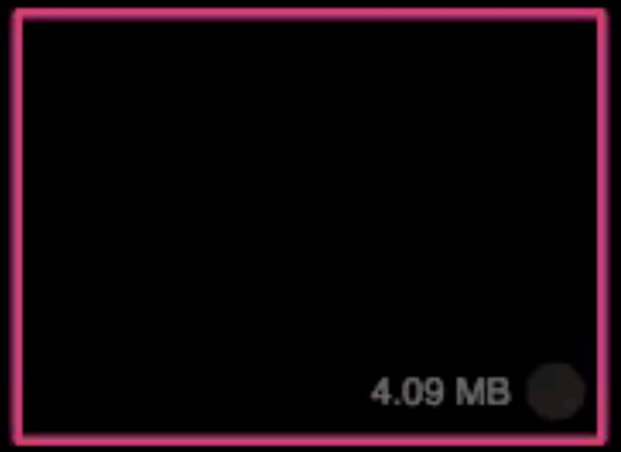
An opportunity to parse Exif data on the client-side

Sometime in the beginning phases of spec'ing out the Uploadr project we realized modern browsers can read an image's data directly from the disk, using the FileReader API (http://www.w3.org/TR/FileAPI/#FileReader-interface). This lead to the realization that we could parse Exif data while the photo is being uploaded, then expose this to the user while

EXIF - THE HIDDEN GEMS

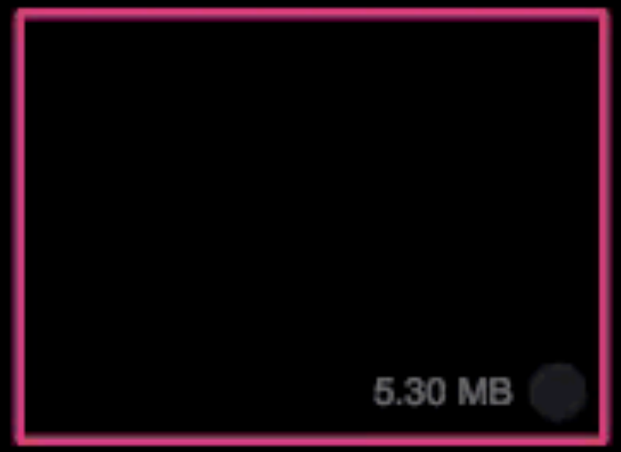
http://code.flickr.net/2012/06/01/parsing-exif-client-side-using-javascript-2/





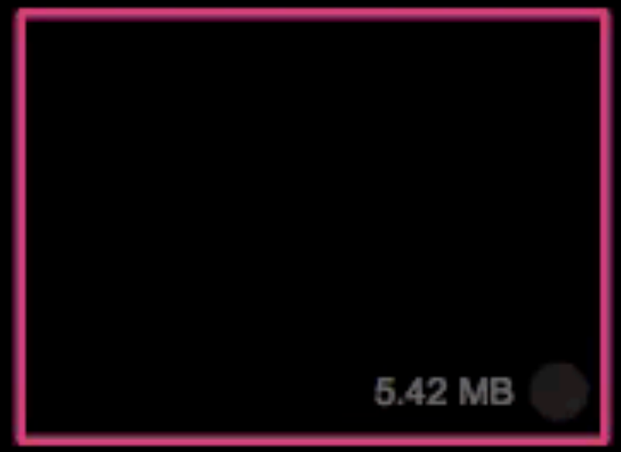
2016-02-08 12.11.01

Add a description



2016-02-08 12.11.10

Add a description

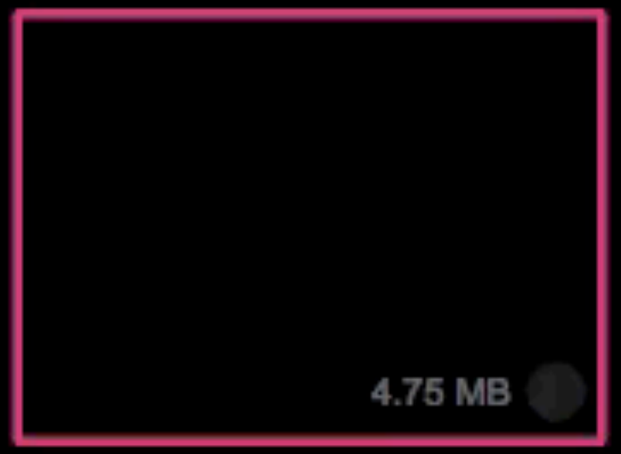


2016-02-08 12.13.16

Add a description

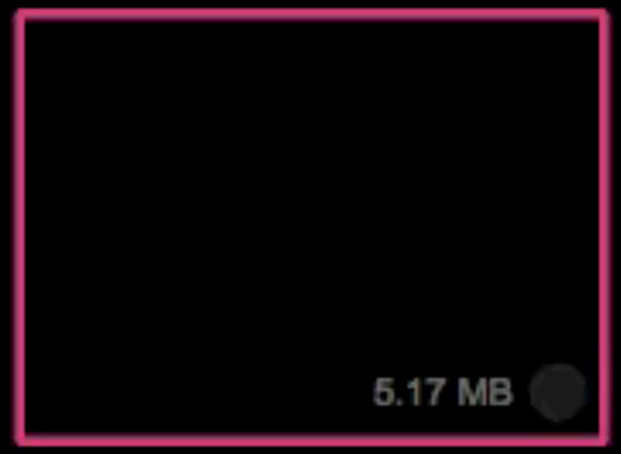
2016-02-08 12.13.28

Add a description



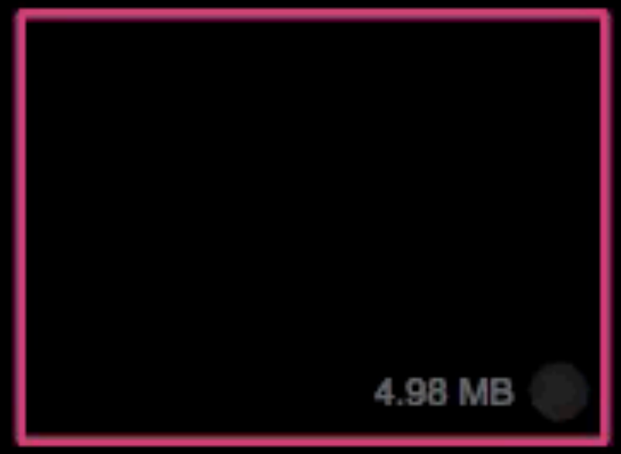
2016-02-08 12.16.14

Add a description



2016-02-08 12.16.33

Add a description

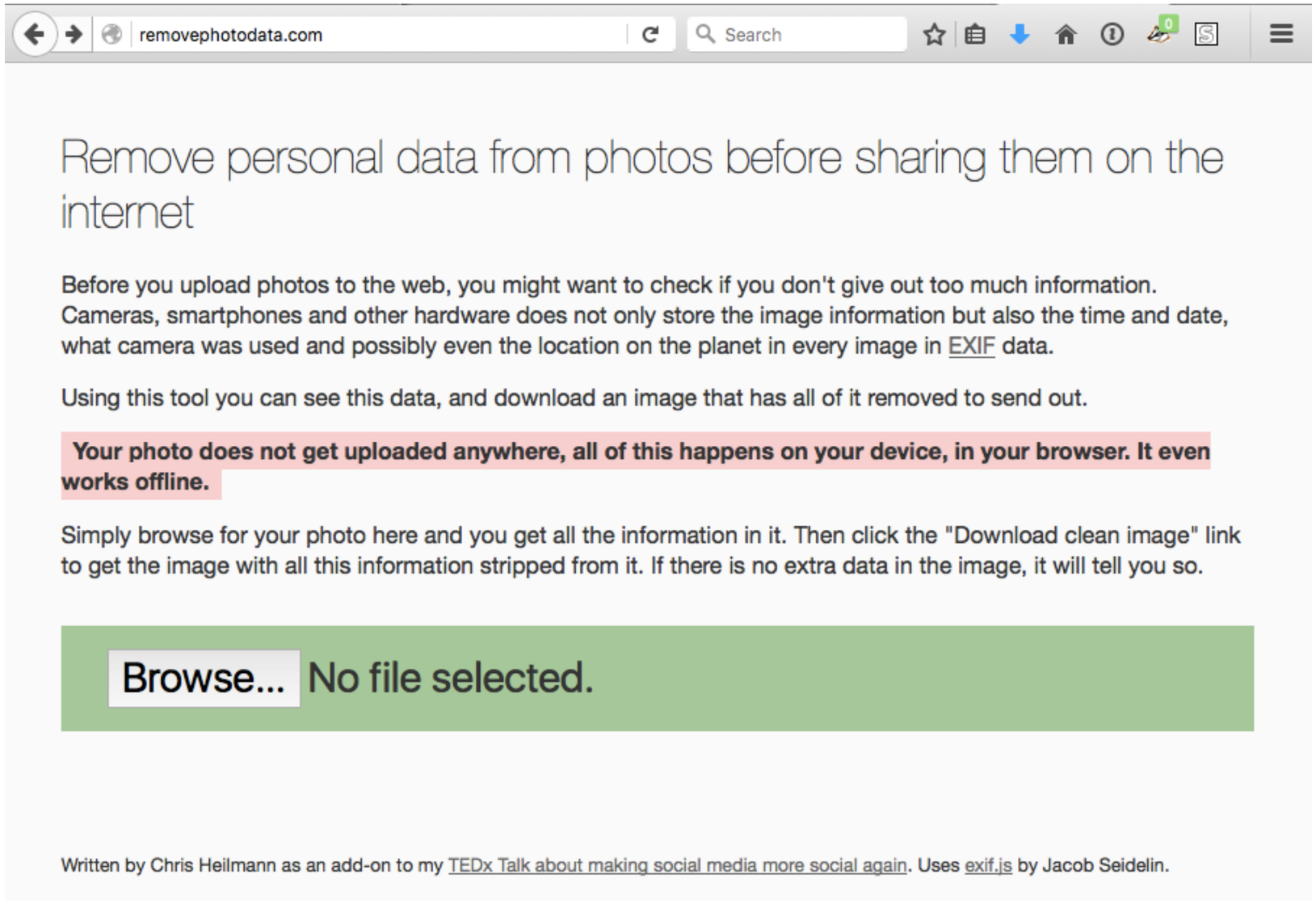


2016-02-08 12.17.04

Add a description

REMOVING EXIF DATA...

http://removephotodata.com/



WHERE?

http://removephotodata.com/image-to-map.html

Display the location a photo was taken

Privacy disclaimer: your photo does not get uploaded anywhere, all of this happens on your device, in your browser. It even works offline.

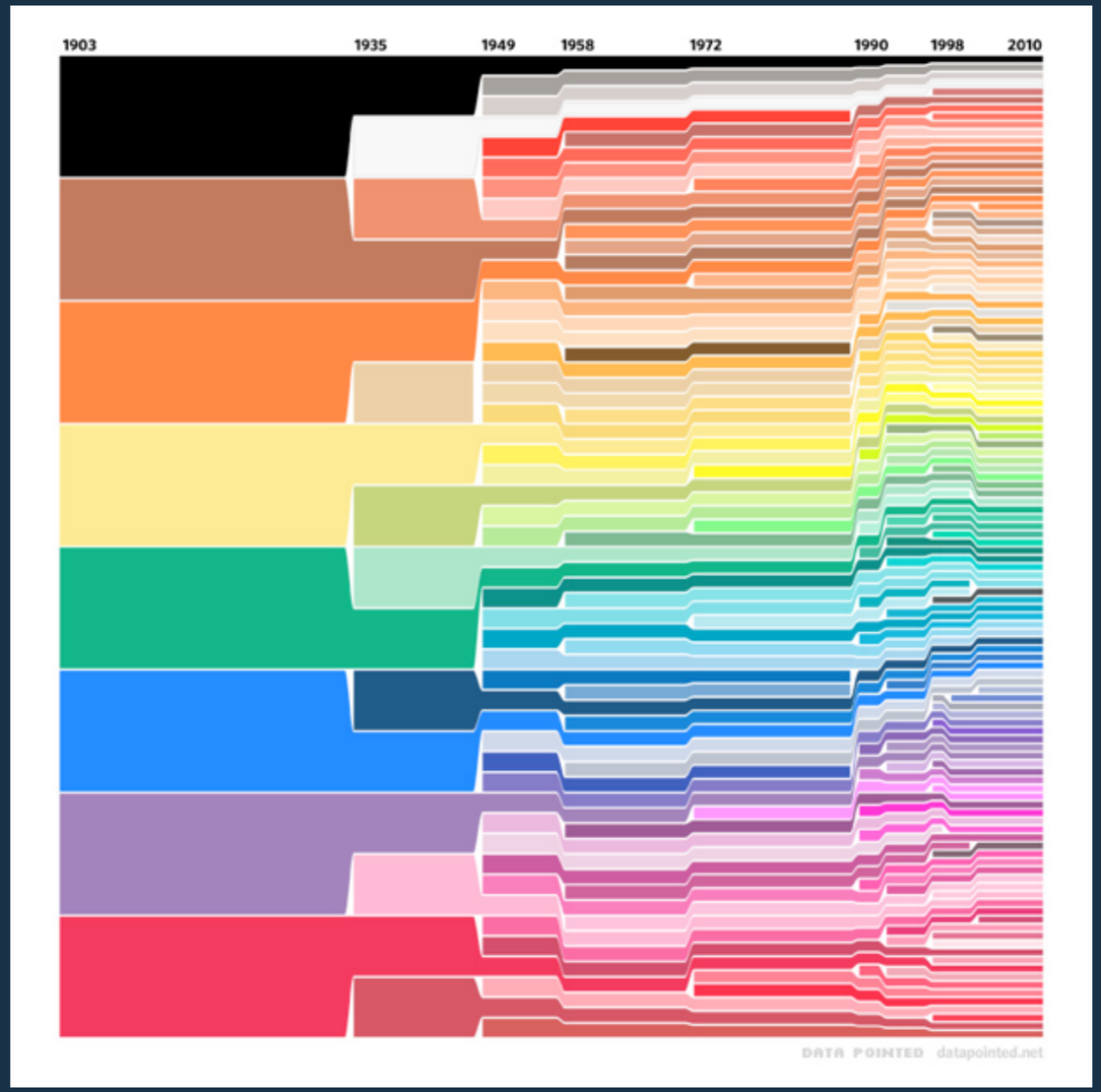
Browse for your photo here and if there is geographical information in it, you'll see a map and get a link to Google maps.

Browse... 2016-01-30 01.03.50.jpg

View on Google Maps

Remove data

SCRIPTING SOLUTIONS FOR
FALLBACK CONTENT



http://www.datapointed.net/2010/01/crayola-crayon-color-chart/

BLUR-UP TECHNIQUE AND LAZY LOADING...

https://css-tricks.com/the-blur-up-technique-for-loading-background-images/

The Complexity of Simple

A couple years ago I went to Best Buy to get a television. I only wanted something flat like they are these days. The salesman convinced me to buy a really expensive “Smart TV.” I don’t like this TV for lots of reasons. Chief among them is that it has a camera on top. Yes, *my television watches me*.

```
<figure name="a51b" id="a51b" class="graf--figure graf-after--p">
  <div class="aspectRatioPlaceholder is-locked" style="max-width: 700px;
 max-height: 466px;">
    <div class="aspect-ratio-fill" style="padding-bottom: 66.60000000000001%;
   "></div>
    <div data-scroll="native" class="progressiveMedia js-progressiveMedia
   graf-image is-canvasLoaded is-imageLoaded"
   data-image-id="1*Ikg-dneX8dBhDNYfLyrvWw.jpeg" data-width="960"
   data-height="639" data-action="zoom"
   data-action-value="1*Ikg-dneX8dBhDNYfLyrvWw.jpeg">
      <img src="https://….jpeg?q=20" crossorigin="anonymous"
     class="progressiveMedia-thumbnail js-progressiveMedia-thumbnail">
      <canvas height="47" width="75" class="progressiveMedia-canvas
     js-progressiveMedia-canvas"></canvas>
      <img src="https://…w.jpeg" class="progressiveMedia-image
     js-progressiveMedia-image" data-src="https://d262i…jpeg">
      <noscript class="js-progressiveMedia-inner">
        <img class="progressiveMedia-noscript js-progressiveMedia-inner"
       src="https:….jpeg">
      </noscript>
    </div>
  </div>
  <figcaption class="imageCaption">
    Um, where’s the ON button?
  </figcaption>
</figure>
```

COUNTING PIXELS... https://codepo8.github.io/canvas-images-and-pixels/

Colour analysis using Canvas

You can use this to read the pixel data of an image and run some analysis on it. For example, you could display all the colours used and sort them by amount of pixels.

The logic of analysing the colours used and displaying them by most used to least is:

1. Create an object for the colours and an array for the sorted colours
2. Read the pixel data, loop over it with using a loop with steps of four (to iterate over the pixels)
3. Create a key from the array values (for example $R-$G-$B-$A - where $ are the values)
4. Store the key in the colours object if it doesn't exist yet - if it already exists, increase its value. This means the colours object will now contain all the colours as keys and have the amount of pixels of that colour as its value.
5. Sort the object by value using the new `Object.keys()` method. Call a sort with a comparison function and store it in the "sorted colours" array
6. Iterate over that array and display it as a list

In JavaScript, this looks the following way:

Count the colours used in an image

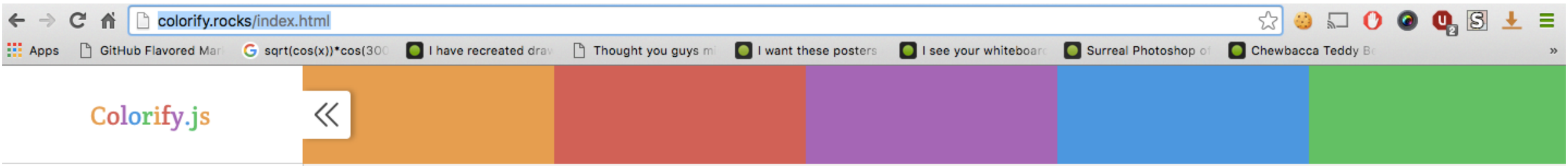
1. 10472
2. 1146
3. 776
4. 326

COUNTING PIXELS... https://codepo8.github.io/canvas-images-and-pixels/

```
var sourceimage = document.querySelector('img');
var canvas = document.querySelector('canvas');
var colourlist = document.querySelector('ol');
var context = canvas.getContext('2d');
var width = sourceimage.width;
var height = sourceimage.height;
canvas.height = height;
canvas.width = width;
context.drawImage(sourceimage,0,0);
var colours = {};
var sortedcolours = [];
var data = context.getImageData(0,0,width,height).data;
canvas.style.display = 'none';
var all = data.length;
for (var i = 0; i < all;i += 4) {
   var key = data[i] + '-' + data[i+1] + '-' + data[i+2] + '-' + data[i+3];
   colours[key] = (colours[key]) ? colours[key]++ : 1;
}
sortedcolours = Object.keys(colours).sort(
   function(a, b) {
      return -(colours[a] - colours[b]);
   }
);
var out = '';
sortedcolours.forEach(function(key){
   var rgba = key.split('-');
   out += '<li><span style="background: rgba(' +
            rgba[0] + ',' + rgba[1] + ',' + rgba[2] +
            ',' + rgba[3] +');">    </span> ' +
            colours[key] + '</li>';
});
colourlist.innerHTML = out;
```

COLORIFY.JS

http://colorify.rocks



COLOR THIEF

http://lokeshdhakar.com/projects/color-thief/

lokeshdhakar.com/projects/color-thief/

Search

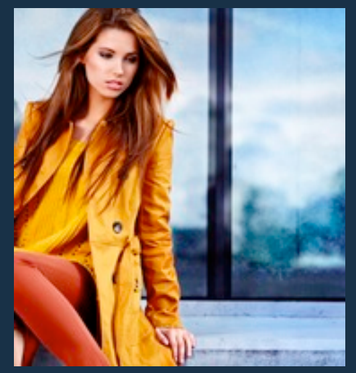
Tweet

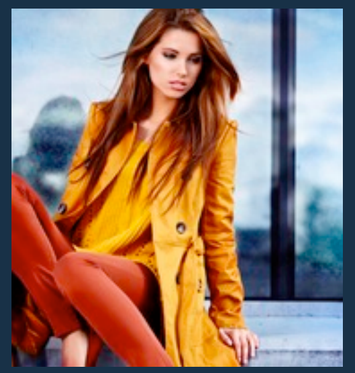
DOWNLOAD FROM GITHUB

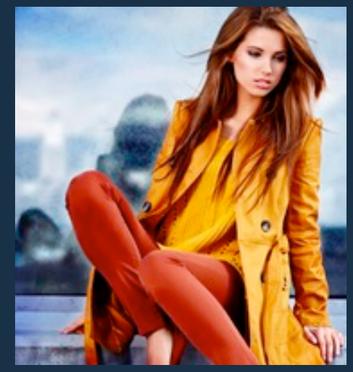
EXAMPLES

INTELLIGENT IMAGE RESIZING

BY HAND OR WITH CLOUD SERVICES







SMARTCROP.JS

https://github.com/jwagner/smartcrop.js/

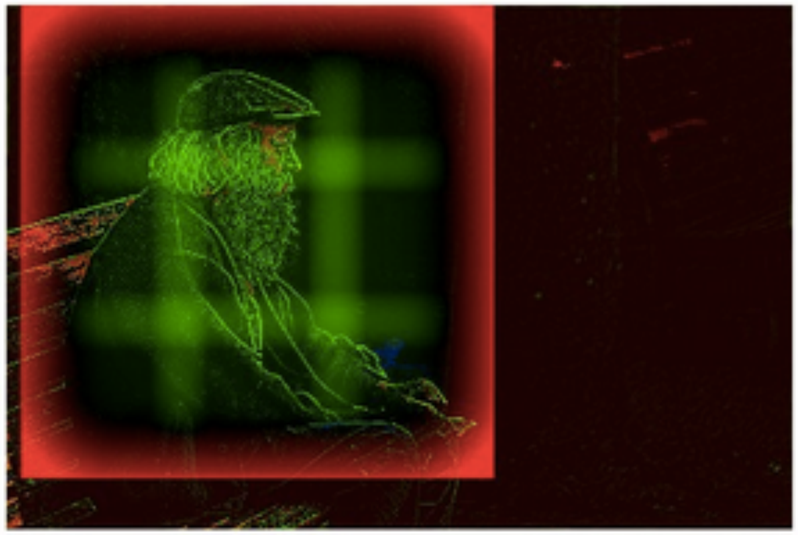
jwagner / **smartcrop.js**

Watch 248 | Star 8,677 | Fork 377

Code | Issues 0 | Pull requests 1 | Wiki | Pulse | Graphs

Content aware image cropping http://29a.ch/2014/04/03/smartcrop-content-aware-image-cropping

48 commits | **3** branches | **0** releases | **7** contributors



README.md Merge pull request #21 from dimitrovskif/master 3 months ago

INTELLIGENT RESIZING

http://cloudinary.com/blog/automatically_art_directed_responsive_images

Automatically art-directed responsive images

by Eric Portis · Feb 03, 2016

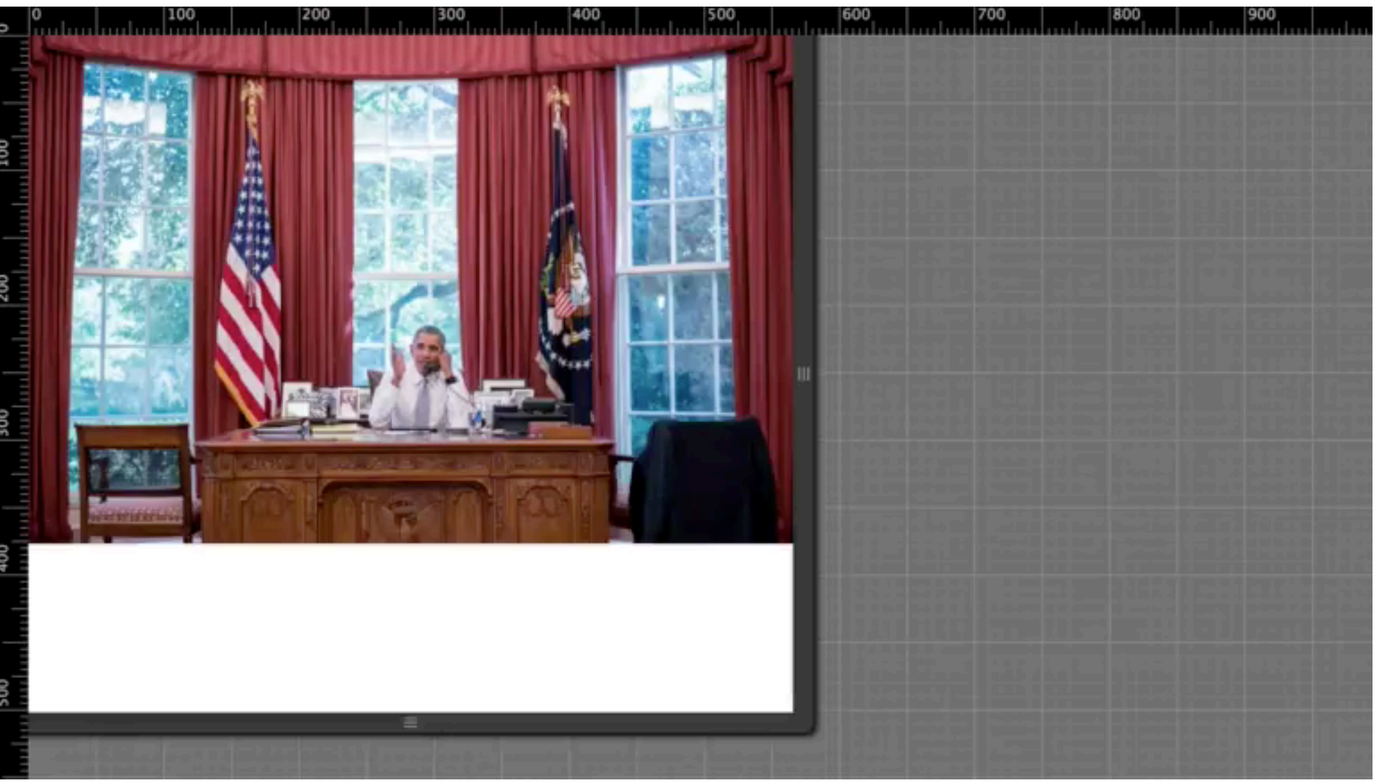
Tweet LinkedIn

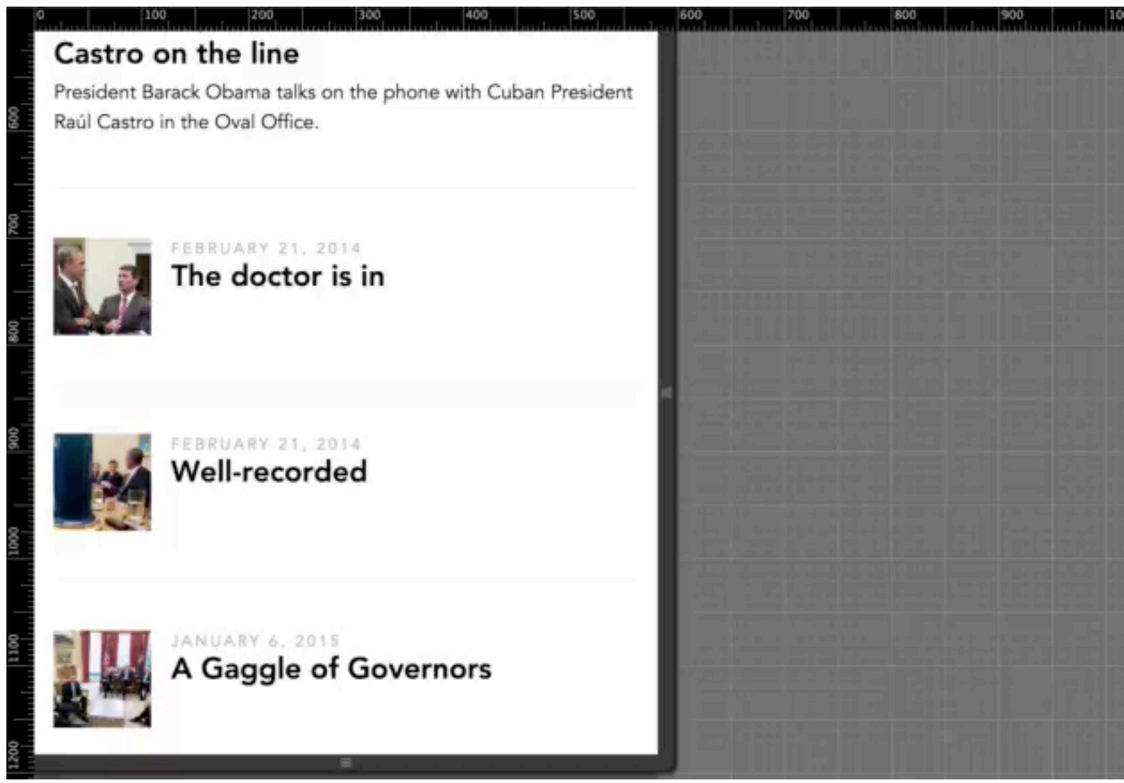
URL | Ruby | PHP | Python | Node.js | Java | jQuery | .Net | All

```
http://res.cloudinary.com/eeeps/image/upload/c_fill,ar_16:9,w_640/on_the_phone.jpg
```

INTELLIGENT RESIZING

http://cloudinary.com/blog/automatically_art_directed_responsive_images



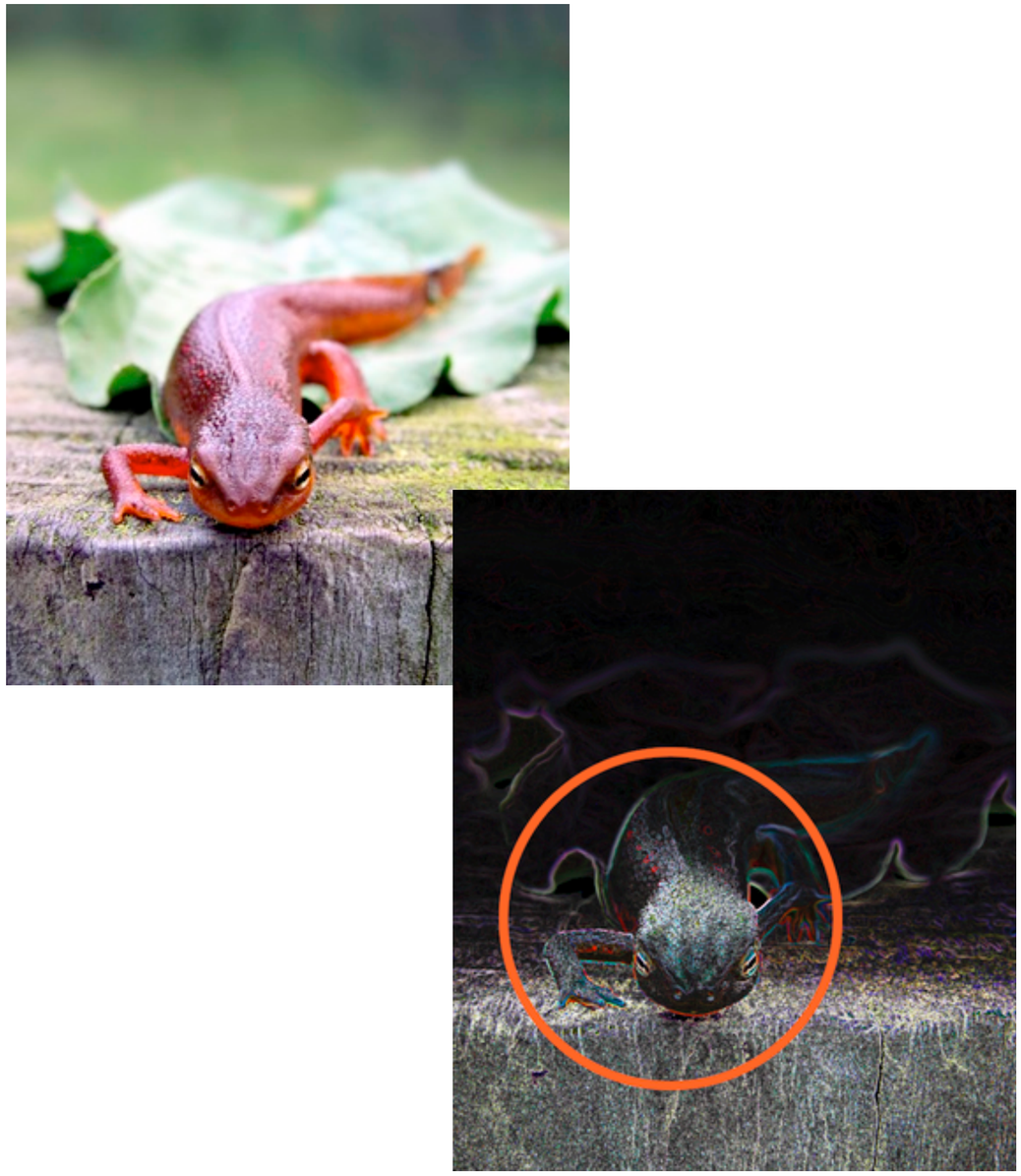


HIGH CONTRAST TRICKS

https://blog.imgix.com/2015/10/21/automatic-point-of-interest-cropping-with-imgix.html

Automatic Point-of-Interest Cropping with imgix

Published 4 months ago Facebook Tweet Mail

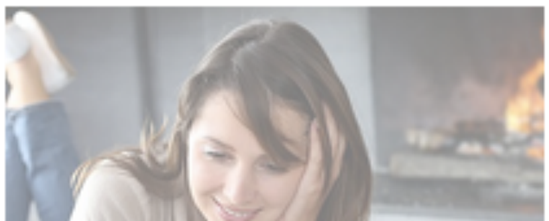


Cropping an image is an important task for an image service. We're always looking to improve and expand the cropping methods available to imgix customers so they can provide even better experiences to their end users. In collaboration with a few of our customers, we have developed and are excited to announce a new crop mode called `entropy`. This new mode dynamically crops images to focus on the subject of the image.

PROJECT OXFORD

https://www.projectoxford.ai

https://oxfordportal.blob.core.windows.ne



AUTOMATED TAGGING

USING MACHINE LEARNING CLOUD SERVICES

FEATURE ANALYSIS

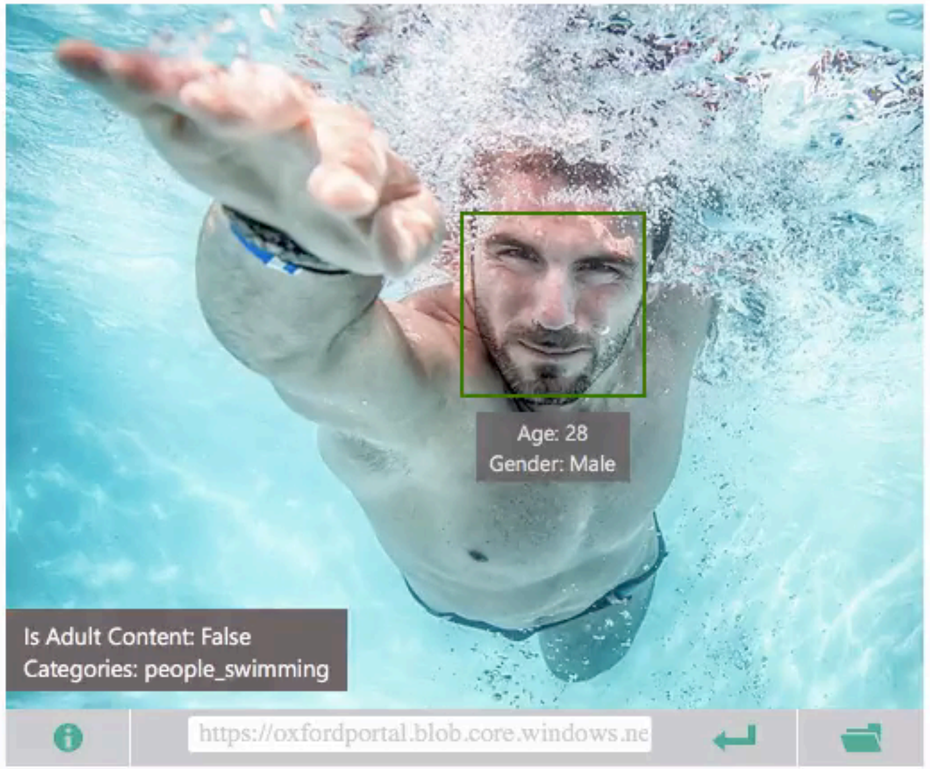
https://www.projectoxford.ai

https://www.projectoxford.ai/demo/vision#Analysis

Search

Feature Analysis

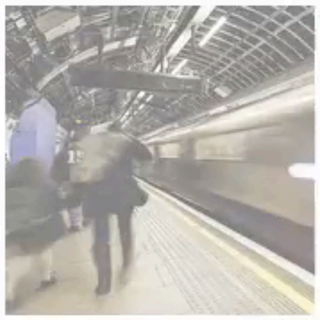
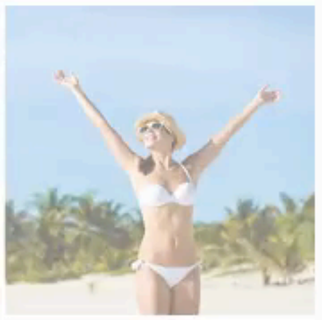
Please try vision feature analysis demo by uploading a local image, or providing an image URL. P.S. We don't keep your images for this demo.



Features:

Feature Name	Value
Image Format	Jpeg
Image Dimensions	1500 x 1155
Clip Art Type	0 Non-clipart
Line Drawing Type	0 Non-LineDrawing
Black & White Image	False
Is Adult Content	False
Adult Score	0.14916780591011047
Is Racy Content	False
Racy Score	0.12426207214593887
Categories	[{ "name": "people_swimming", "score": 0.98046875 }]







01

FACIAL DETECTION AND RECOGNITION...

Firefox File Edit View History Bookmarks Tools Window Help — Christian Heilmann — Sat 05:55 pm

https://www.projectoxford.ai/demo/face#detection

Microsoft
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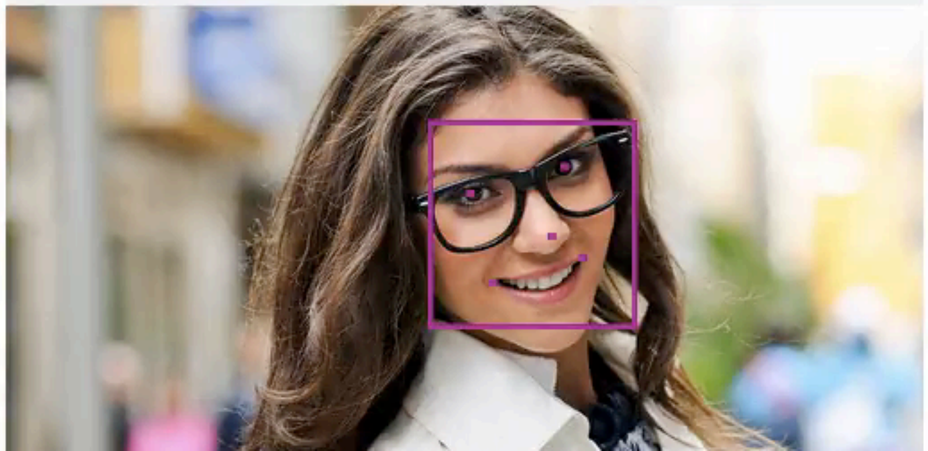
Face Demo

Face APIs >

Face Detection

Find detailed features in an image including face rectangles, face attributes, landmarks, pose, gender and age with the demo below. Please click the image samples to see how Face API uses world-class machine learning techniques to provide these results. You can also click the open image button or drag-and-drop to upload your own images, or input a URL for a remote image. Learn More

- Image resolution ≥ 36x36 pixels and the file size < 4MB, Supported image formats include: JPEG, PNG, GIF(the first frame), BMP.
- The frontal and near-frontal faces have the best results. And the maximum returning faces is set to 64 for each image.
- Age and gender classification are experimental and not always accurate.



```
Detection Result:
JSON:
[
  {
    "faceId": "729ad52b-b033-454c-828b-8e7a96e06b15",
    "faceRectangle": {
      "width": 228,
      "height": 228,
      "left": 460,
      "top": 125
    },
    "faceLandmarks": {
      "pupilLeft": {
        "x": 507,
```

EMOTION RECOGNITION…

https://www.projectoxford.ai/demo/Emotion

Search

Emotion Recognition

Identify emotions communicated by the facial expressions in an image. Please click the image samples to see how Emotion API uses world-class machine learning techniques to provide these results. You can also click the open image button or drag-and-drop to upload your own images, or input a URL for a remote image.

- Image resolution ≥ 36x36 pixels and the file size < 4MB, Supported image formats include: JPEG, PNG, GIF(the first frame), BMP.
- The frontal and near-frontal faces have the best results. And the maximum returning faces is set to 64 for each image.
- Recognition is experimental, and not always accurate.
- P.S. We don't keep your images for this demo.

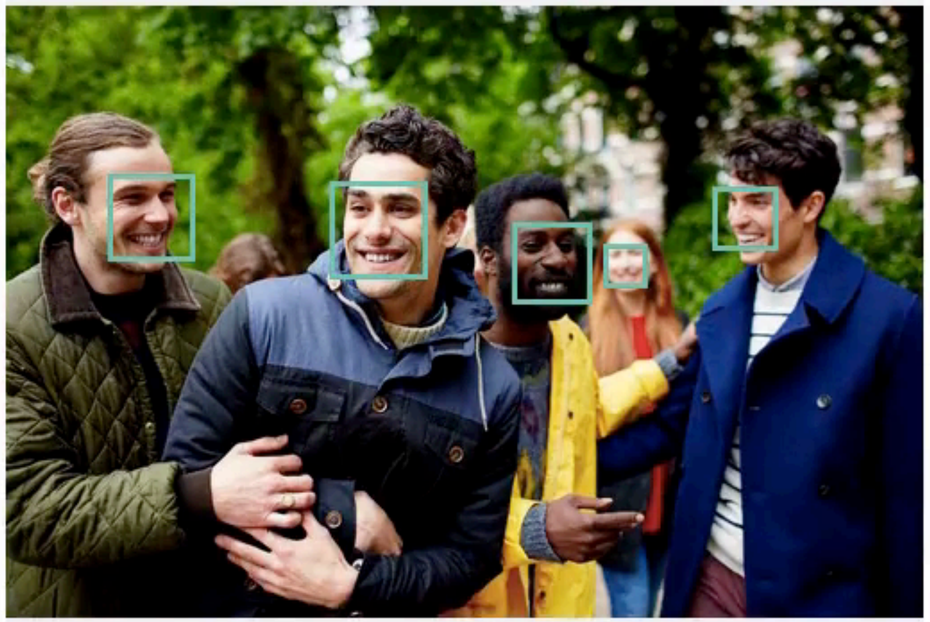
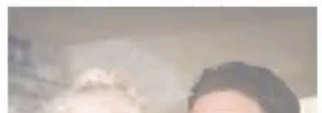


Image URL





```
Detection Result:
5 faces detected

JSON:
[
  {
    "faceRectangle": {
      "left": 488,
      "top": 263,
      "width": 148,
      "height": 148
    },
    "scores": {
      "anger": 9.075572e-13,
      "contempt": 7.048959e-9,
      "disgust": 1.02152783e-11,
      "fear": 1.778957e-14,
      "happiness": 0.9999999,
      "neutral": 1.31694478e-7,
      "sadness": 6.04054263e-12,
      "surprise": 3.92249462e-11
    }
  }
```

BONUS ROUND

DEMOS USING THESE SERVICES...

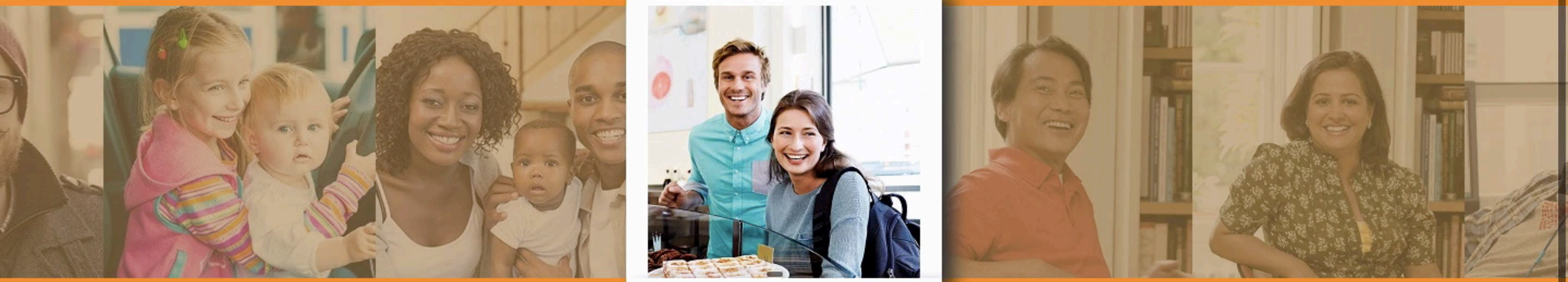
how-old.net

Search

How-Old.net

How old do I look? #HowOldRobot

Search Faces...



Use this photo

Use your own photo

Microsoft

P.S. We don't keep the photo

Tweet

Waiting for how-old.net...

http://how-old.net/

https://www.mymoustache.net/#

Search

Microsoft

MyMoustache.net

62,303 faces analyzed and counting #MyMoustacheRobot

Donate my photo to science.

Use your own photo

P.S. We don't keep the photo

Raise money for men's health

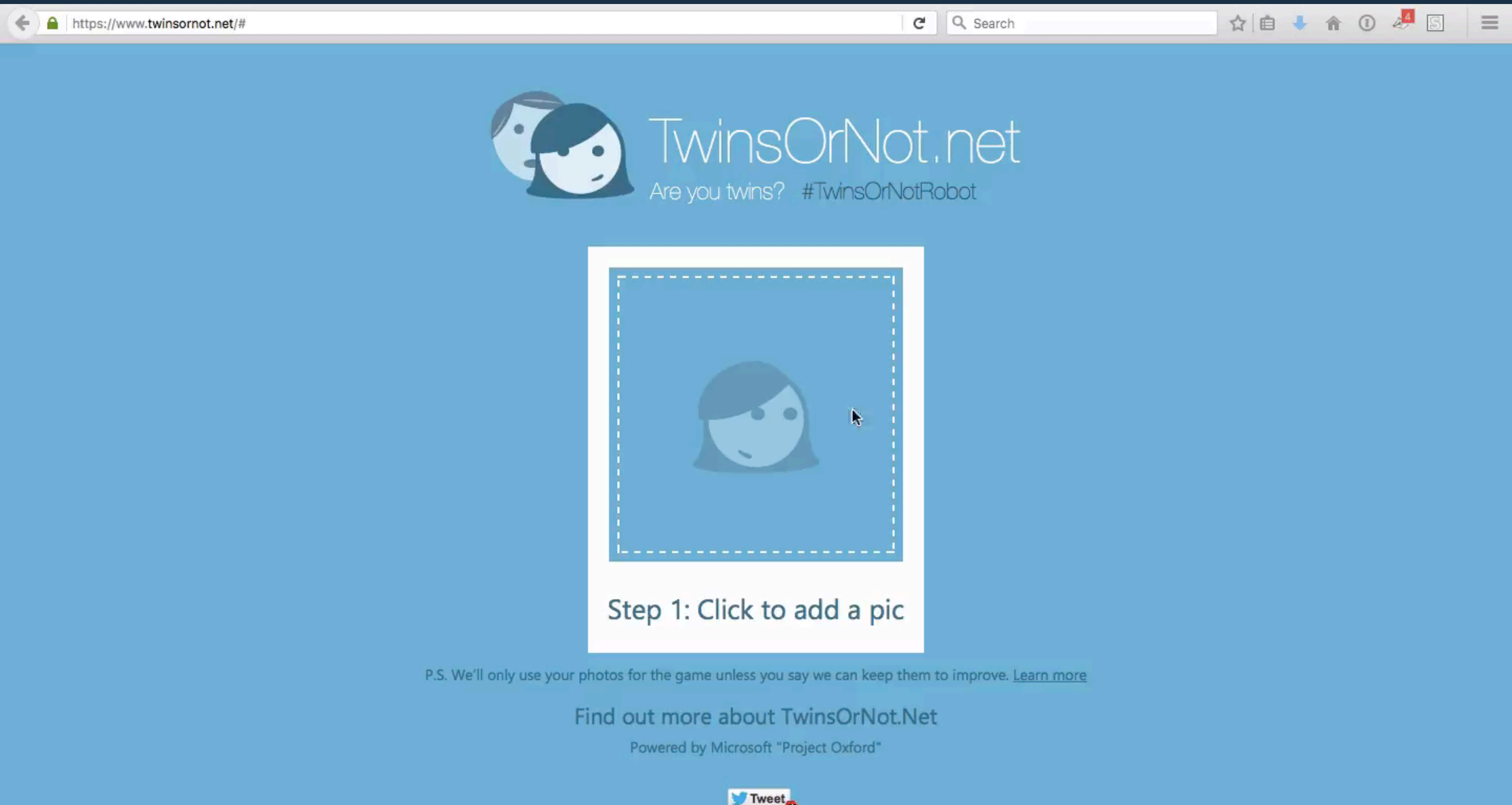
The magic behind MyMoustache.net, a Microsoft Garage Project

Tweet

http://mymoustache.net/

TWINS OR NOT?

https://www.twinsornot.net



IT IS UP TO YOU TO KEEP THE WEB **EXCITING AND USABLE** FOR THE NEXT GENERATION OF USERS.

AND IT IS NOT ABOUT WHO IS THE PRETTIEST...

IT IS ABOUT WHO **PERFORMS** BEST, IS MOST **ACCESSIBLE** AND IS **USABLE** BY ALL KIND OF PEOPLE - NOT THE ONES WHO ARE ALREADY **BORED** OF IT...

THANK YOU!

CHRIS HEILMANN @CODEPO8