# Space Apps Challenge 2018 Kickoff

## Web Design Accessibility, Performance and Aesthetics

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**Pasadena, October 2018**

UCLA IoES

www.ioes.ucla.edu

# Southern California as Seen From Apollo 7

**This view of southern California was taken by the Apollo 7 crew during their 18th revolution of the Earth, on Oct. 12, 1968.**

# What are the building blocks of the web?

# HTML and CSS

# HTML Elements

<head>, <title>, <body>, <header>, <nav>, <article>, <section>, <img>, <aside>, <h1> <p>, , , <footer>, <audio>, <details>,  <video>

# CSS Properties

- CSS Grid Layout
- CSS Flexbox
- CSS Multicolumn Layout
- CSS Transitions
- CSS Variable Fonts
- CSS Box model

Is building for the web easy?

HTML5, Mustache, Handlebars, Blade, Jade, Twig, Bootstrap, Foundation, Material Design, CSS3, Sass, Less, SMACSS, OOCSS, BEM, jQuery, Angular, Ember, Meteor, React,  React Native, Backbone, React again (just in case), NodeJS, Espresso, CoffeeScript, IcedCoffeeScript, Java, Cappuccino, Express,  Ionic, Cordova, PhoneGap, Git, SVN, MongoDB, NoSQL, MySQL, YourSQL, HerSQL, OurSQL, AWS, .NET, ASP, Python, PHP (lol JK), Ruby, Ruby on Rails, Drupal 7, Drupal 8, Django, Django Unchained, Wordpress, Wordpress Plugin Development, Joomla, Perch, CQ5, Photoshop, Sketch, Macaw, Froont, Adobe Edge Reflow, Adobe Image Ready, Adobe InDesign, Balsamic, Microsoft Azure, Microsoft Paint, and a whammy bar.

It makes me nervous just thinking about it!

Let's all take a deep breath.

Breathe.

OK. Feel better?

# What kind of people use the Internet?

# Who do we need to design for?

Everyone.

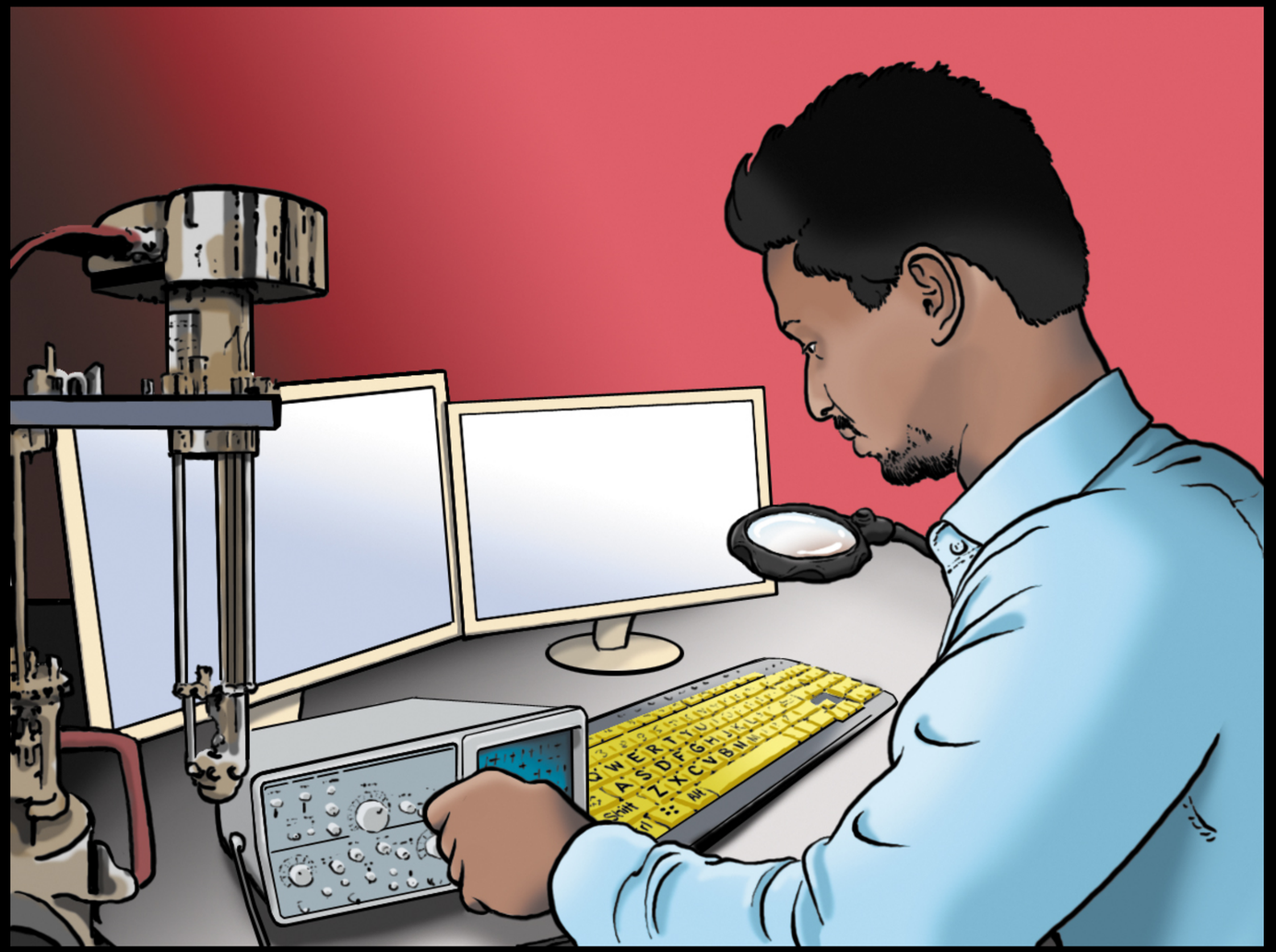
Could be a blind person using a screen reader.

Could be someone in a wheelchair walking her dog.

Could be a special education student.

Could be a business woman.

Could be an engineer flashing a cub scout sign.



Could be an scientist or inventor.

Could be your grandma.

Could be you.

Everyone has access to the world wide web.

# How do people access the web?

THIS IS NOT
THE WEB.
Sun
SPARCstation 10

# THIS IS THE WEB.

The web is not a platform.
It's a continuum.
-Jeremy Keith

https://adactio.com/journal/6692

# What does that mean?

**We have no control.**

I have no control over the end device. It could be a phone, a laptop, an e-reader, a watch, a tv. It could be top-of-the line or it could be budget device with low specs. It could be a device released the other day, or a device released 5 years ago.

http://timkadlec.com/2015/06/thriving-in-unpredictability/

I have no control over the network. It could be fast, it could be slow, it could be down entirely.

-Tim Kadlec

http://timkadlec.com/2015/06/thriving-in-unpredictability/

I have no control over the visitor or their context. They could be sitting down. They could be taking a train somewhere. They could be multitasking while walking down the street. They could be driving (I know). They could be color-blind.

http://timkadlec.com/2015/06/thriving-in-unpredictability/

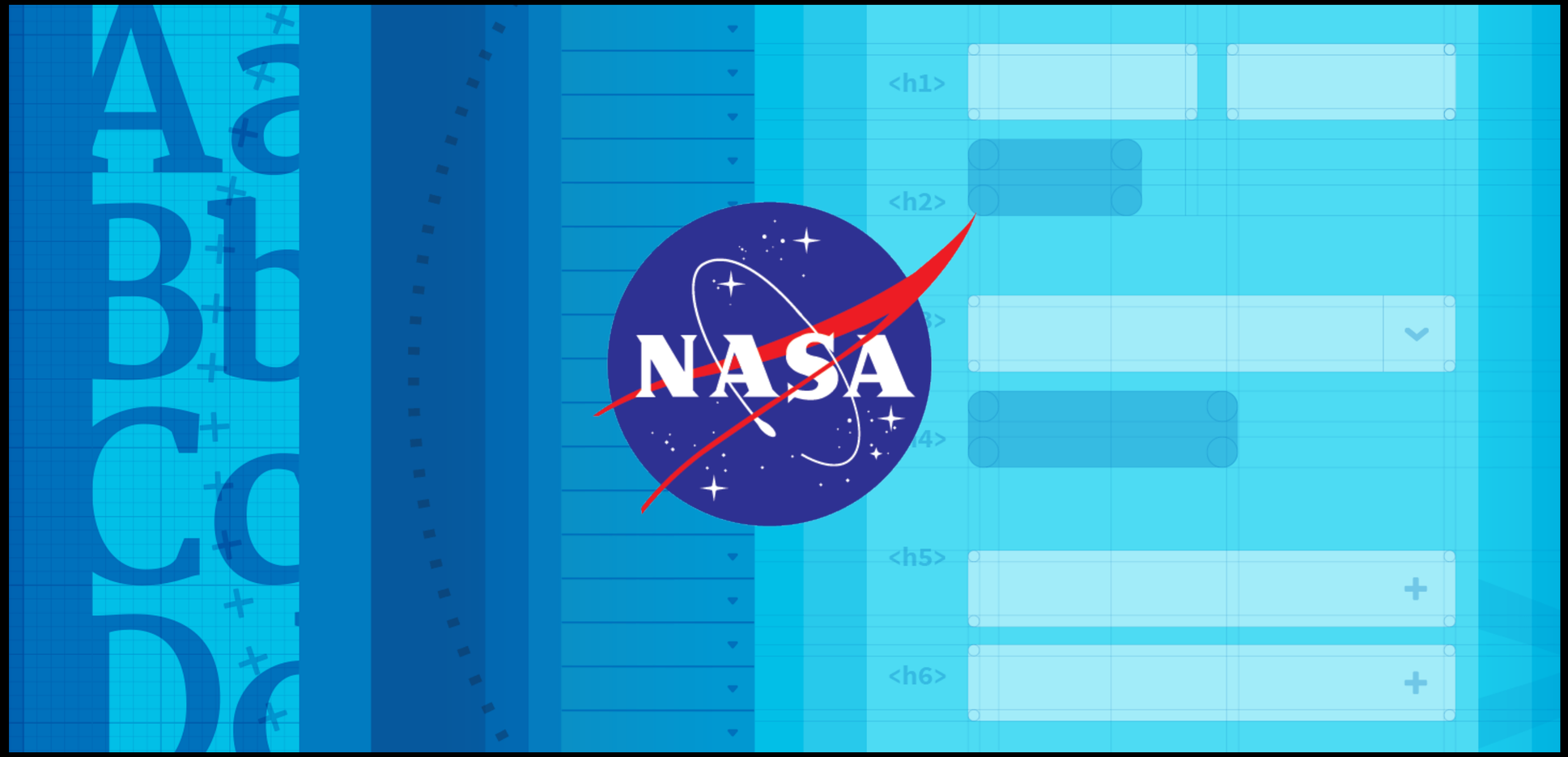
**We have no control. And it's ok.**

I can only control what I do.

# My Design Process

## Accessibility, Performance and Aesthetics

# 1. Accessibility




# NASA Web Design System

**Design and build fast, accessible, mobile-friendly websites backed by user research.**

**“Offer accessibility out of the box.”**

***– NASA Design Principle***

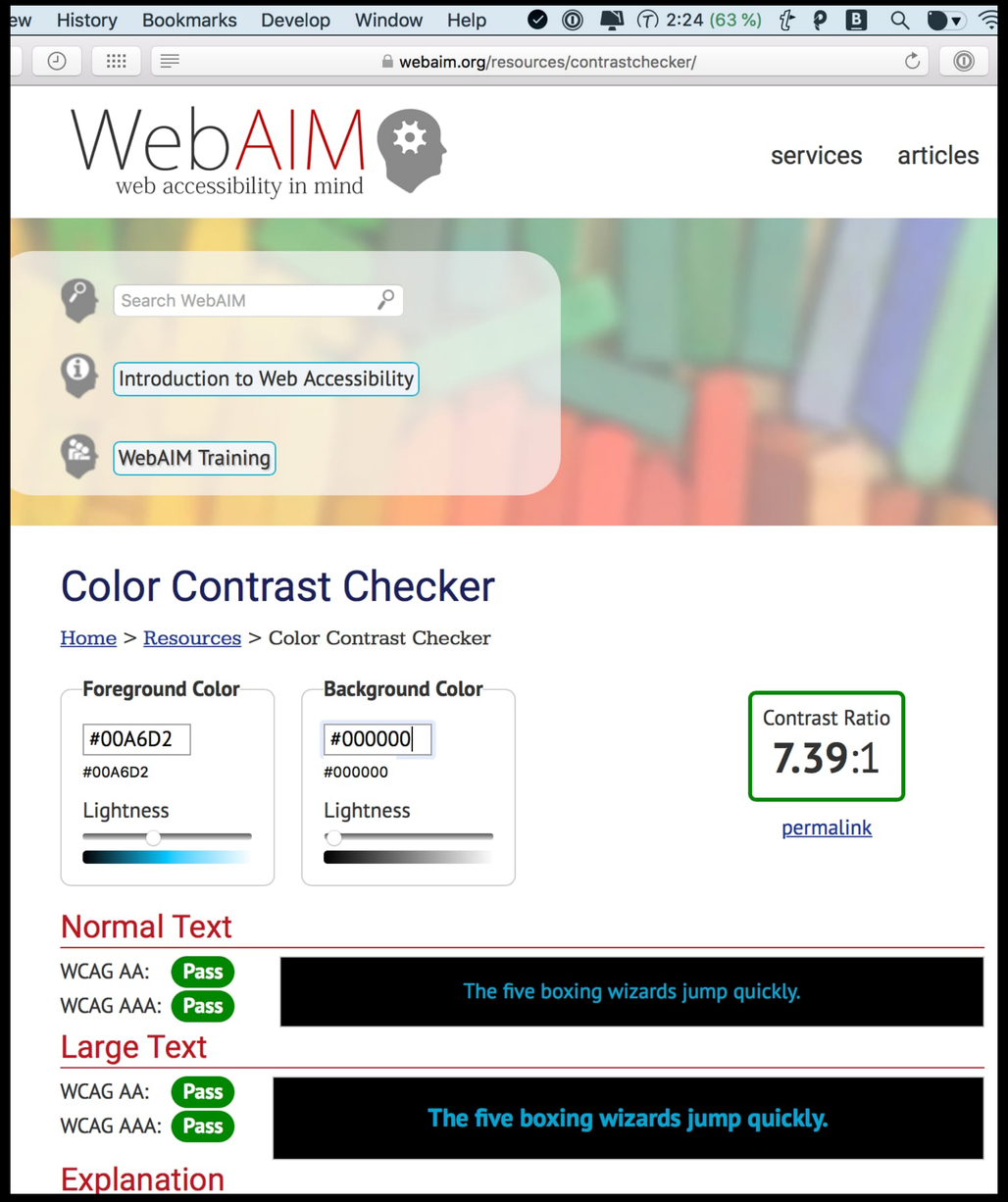
# Web Content Accessibility Guidelines or WCAG 2.1

# Color Contrast Ratio

# Color Contrast Ratio

## Headlines should have a contrast ratio of at least 3:1

Normal text should have a contrast ratio of at least 4.5:1


History Bookmarks Develop Window Help 2:24 (63 %)
webaim.org/resources/contrastchecker/
WebAIM
web accessibility in mind
services articles
Search WebAIM
Introduction to Web Accessibility
WebAIM Training
Color Contrast Checker
Home > Resources > Color Contrast Checker
Foreground Color
#00A6D2
#00A6D2
Lightness
Background Color
#000000
#000000
Lightness
Contrast Ratio
7.39:1
permalink
Normal Text
WCAG AA: Pass
WCAG AAA: Pass
The five boxing wizards jump quickly.
Large Text
WCAG AA: Pass
WCAG AAA: Pass
The five boxing wizards jump quickly.
Explanation

History Bookmarks Develop Window Help 2:28 (63 %)
webaim.org/resources/contrastchecker/
WebAIM
web accessibility in mind
services articles
Search WebAIM
Introduction to Web Accessibility
WebAIM Training
Color Contrast Checker
Home > Resources > Color Contrast Checker
Foreground Color
#DD361C
#DD361C
Lightness
Background Color
#000000
#000000
Lightness
Contrast Ratio
4.62:1
permalink
Normal Text
WCAG AA: Pass
WCAG AAA: Fail
The five boxing wizards jump quickly.
Large Text
WCAG AA: Pass
WCAG AAA: Pass
The five boxing wizards jump quickly.
Explanation

# Color Contrast Ratio

Blue has contrast of 7.39:1

Red has contrast of 4.62:1

# 2. Performance

75% The speed it takes to load the page

66% How easy it is to find what I'm looking for

61% How well the site fits my screen

58% How simple the site is to use

24% How attractive the site looks

UX HIERARCHY

Websites should load fast.

# How fast?

In 2 seconds or less!

Don't assume your audience surfs
the web on a fast, shiny network

# The Need for Speed

## How do I design for performance?

# Set a performance budget

# Optimize images

# Remove unused code

# Test with Google Lighthouse, Web Page Speed Test and Pingdom Tools

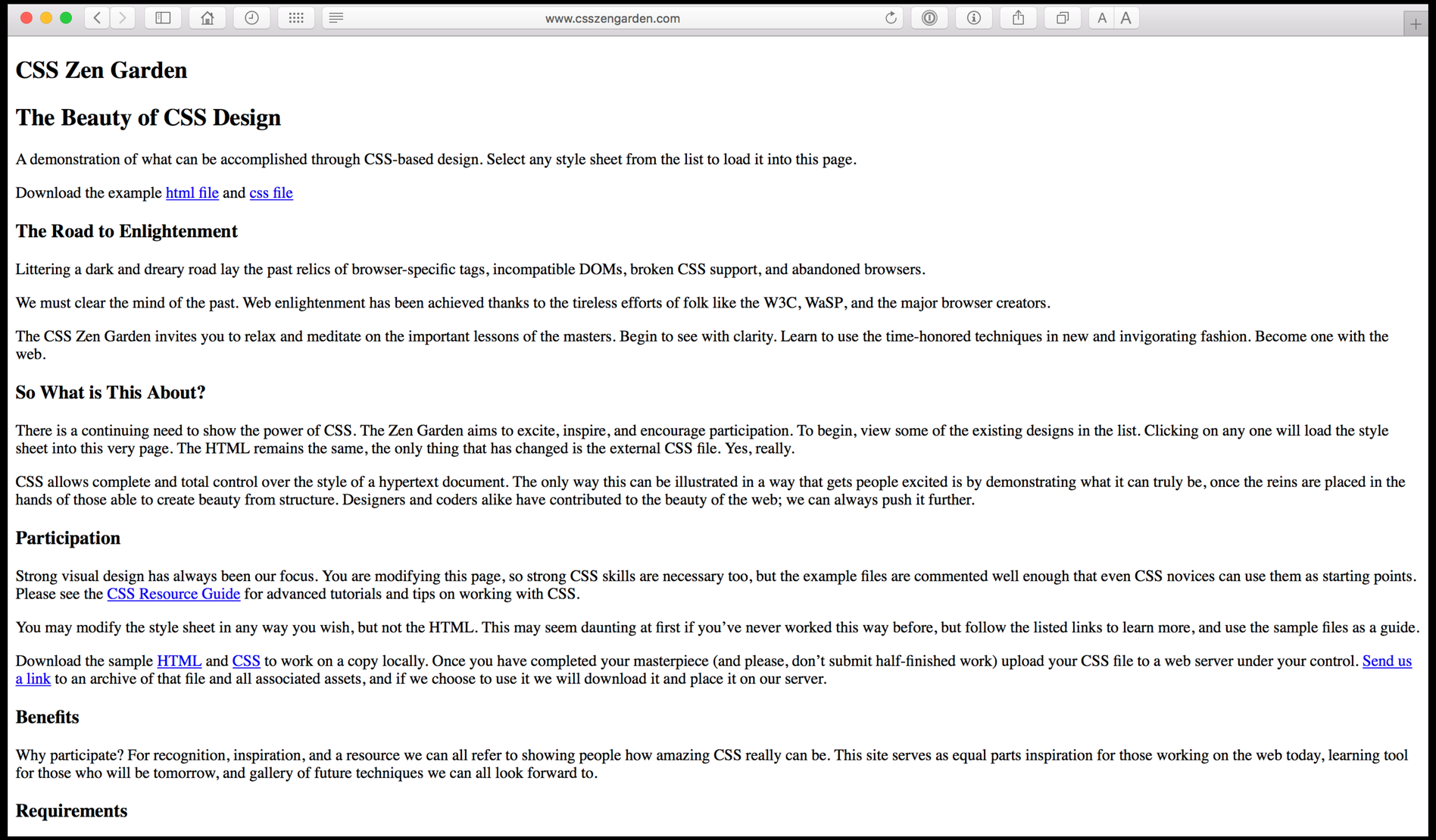
# Test

- **Google Lighthouse**
  https://developers.google.com/web/tools/lighthouse/
- **Web Page Speed Test**
  https://www.webpagetest.org
- **Pingdom Tools**
  https://tools.pingdom.com

# 3. Aesthetics

Websites still gotta look good.

# CSS Zen Garden, 2003




**HTML with no CSS styles**

**MID CENTURY MODERN**
**by Andrew Lohman**

www.csszengarden.com/218/

no. 218 5.23 fl oz

DR. SHEA'S MIRACULOUS

# CSS Zen Garden

## THE BEAUTY OF CSS DESIGN

A demonstration of what can be accomplished through CSS-based design.
Select any style sheet from the list to load it into this page.

*Download the example html file and css file*

## THE ROAD TO ENLIGHTENMENT

**APOTHECARY**
**by Trent Walton**

**STEEL**
**by Steffen Knoeller**

www.csszengarden.com/215/

# CSS Zen Garden

*The Beauty of CSS Design*

*A demonstration of what can be accomplished through CSS-based design. Select any style sheet from the list to load it into this page.*
*Download the example html file and css file*

## The Road to Enlightenment

Littering a dark and dreary road lay the past relics of browser-specific tags, incompatible DOMs, broken CSS support, and abandoned browsers.

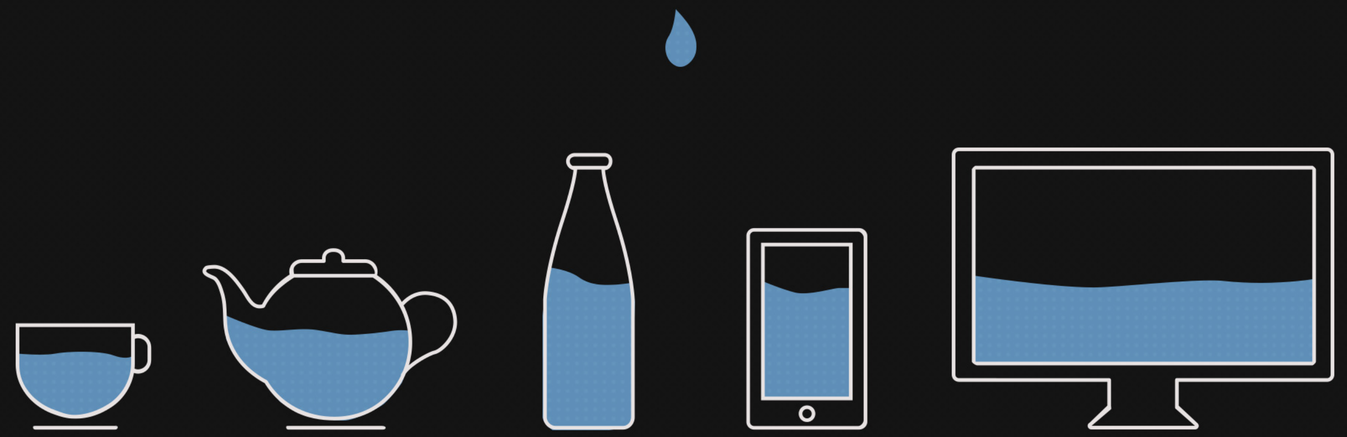
## So What is This About?

There is a continuing need to show the power of CSS. The Zen Garden aims to excite, inspire, and encourage participation. To begin, view some of the existing designs in the list. Clicking on any one will load the style sheet into this very page. The HTML remains the same, the only thing that has changed is the external CSS file. Yes, really.

**A ROBOT NAMED JIMMY**
**by meltmedia**

# Responsive Web Design, 2010

# CONTENT IS LIKE WATER

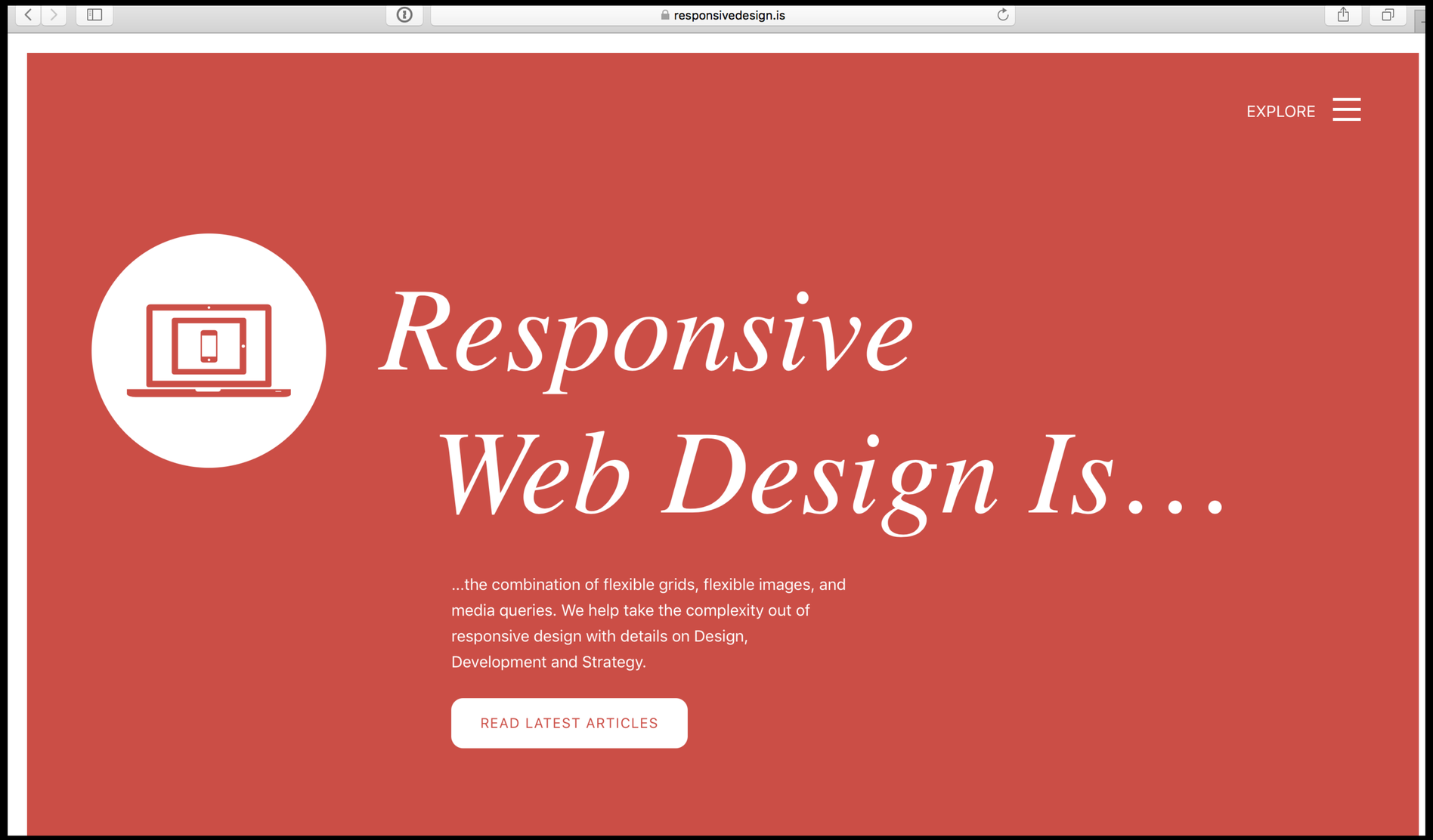


"You put water into a cup it becomes the cup.
You put water into a bottle it becomes the bottle.
You put it in a teapot, it becomes the teapot."

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

Illustration by Stéphanie Walter

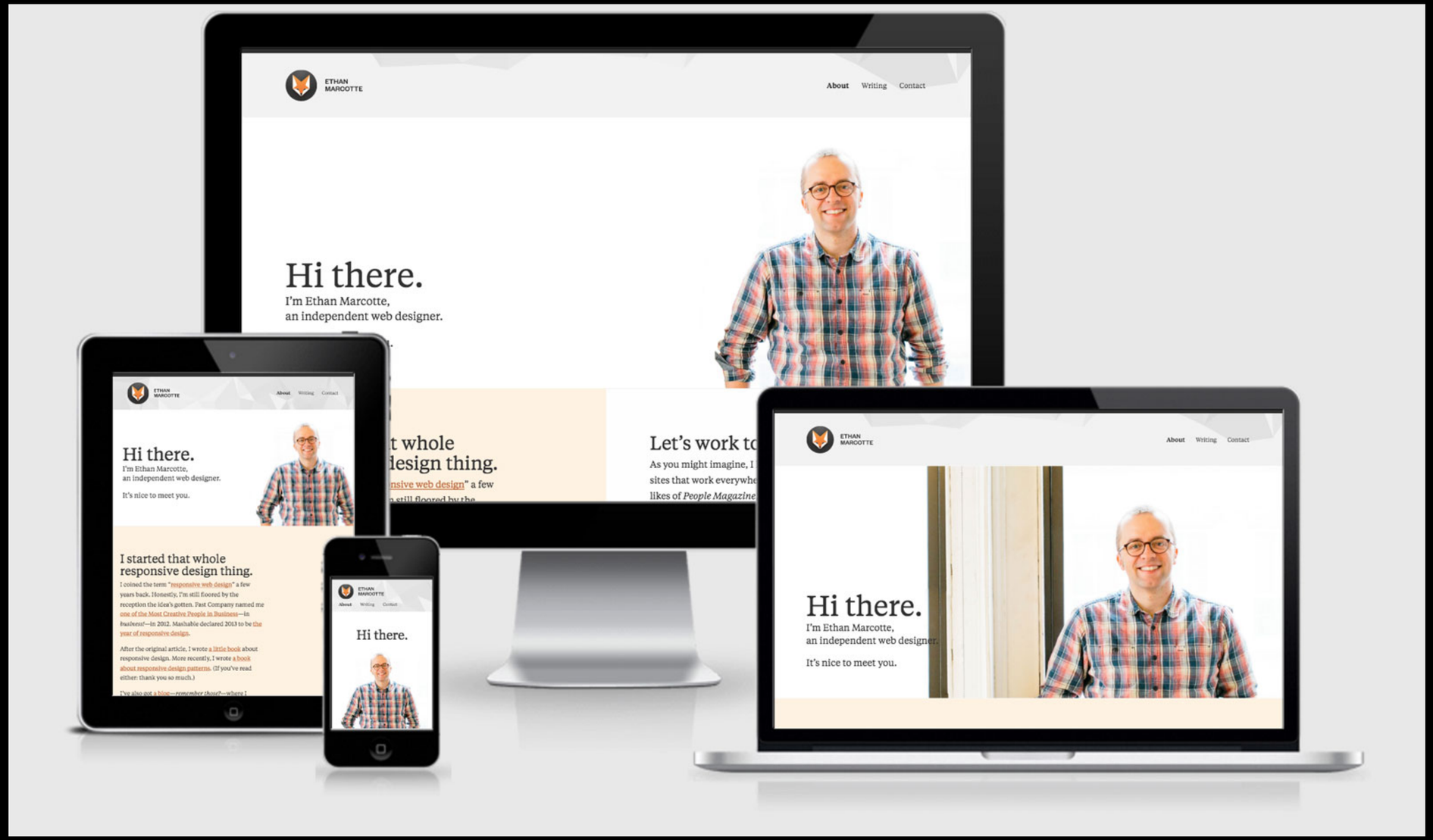
**Stephanie Walter**




**Justin Avery, site and newsletter**

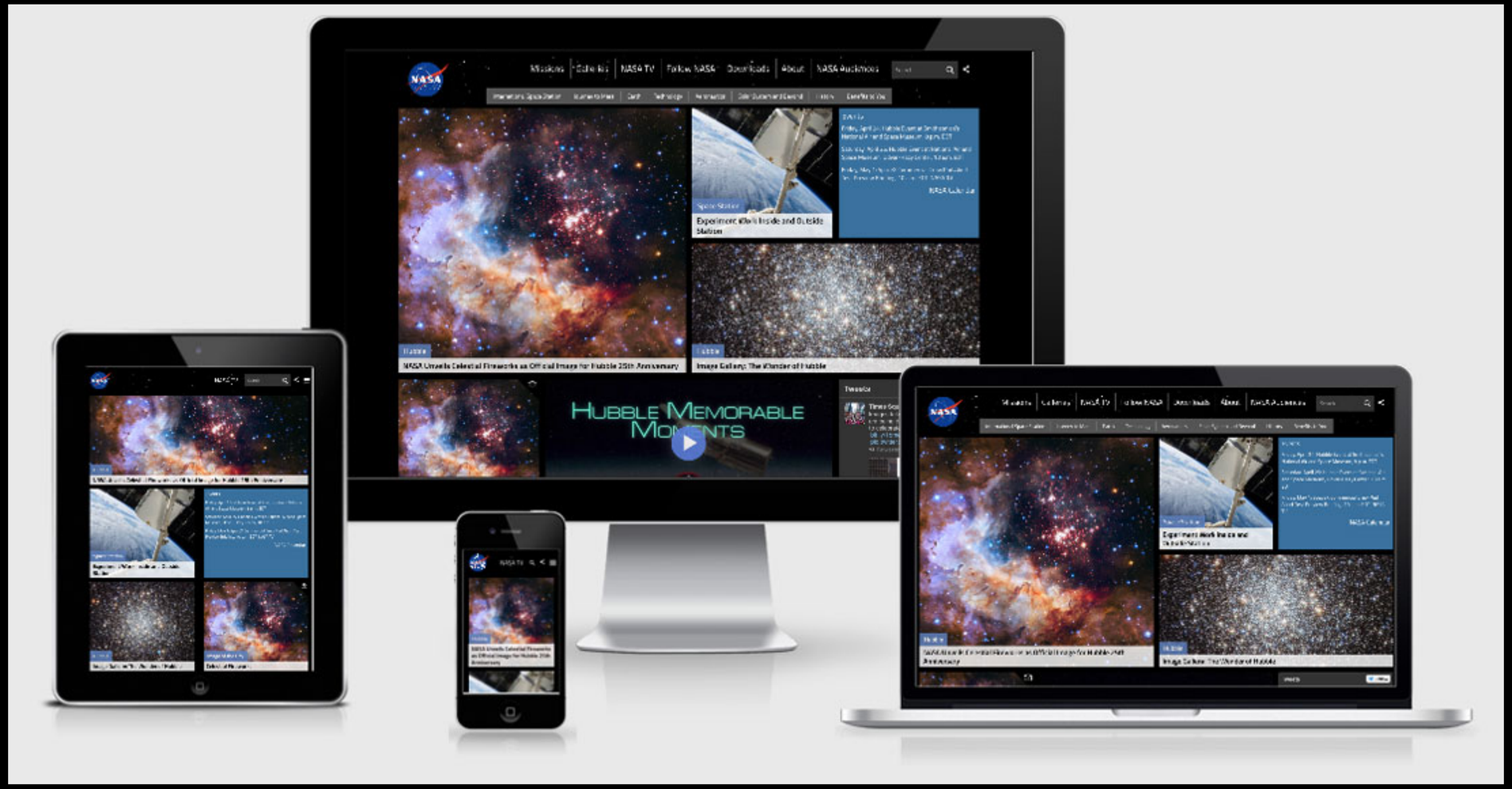
**“Responsive Web Design is the combination of flexible grids, flexible images, and media queries.”**

***–Justin Avery***



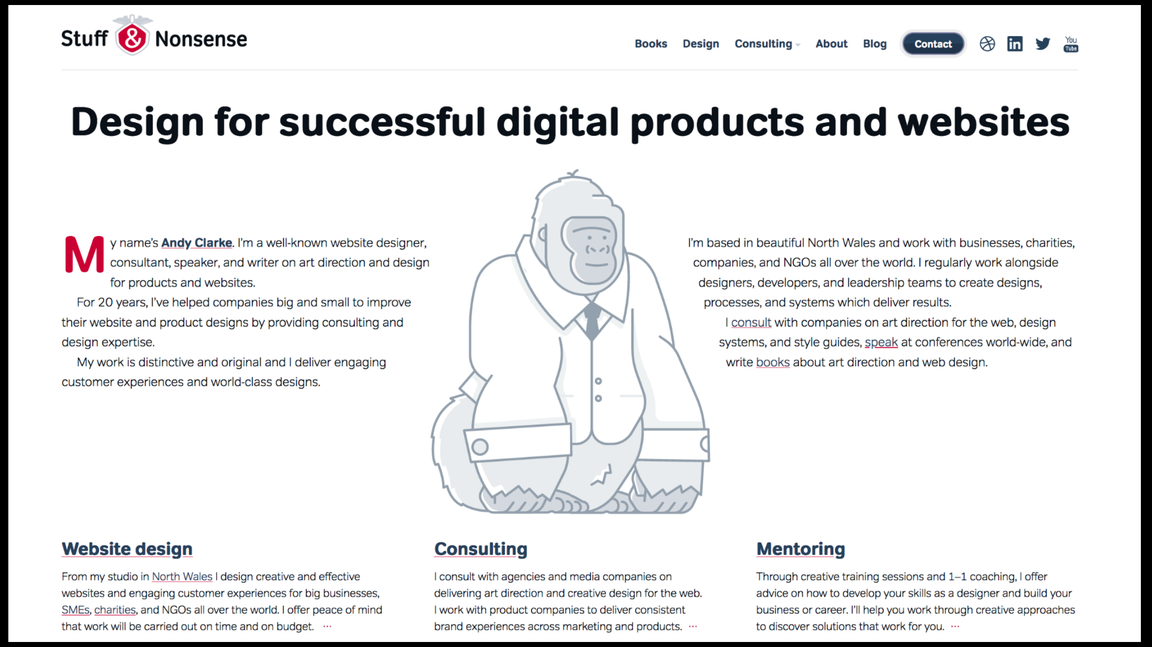

# Ethan Marcotte RWD across 4 viewports

Responsive Field Day across 4 viewports




# NASA across 4 viewports

“Art direction and design helps your audience feel something”




**Andy Clarke, Head of Creative at Stuff and Nonsense. Design consultant and mentor. Author of "Art Direction for the Web"**

# Hatton Garden (Un)Safe Deposit Company

**How four old-school London villains pulled off the biggest heist in British history and drove away with £200 million in stolen jewellery from safety deposit boxes.**

IN APRIL 2015, the Hatton Garden Safe Deposit Company, an underground safe deposit facility in London's Hatton Garden area, was burgled. The total stolen may have a value of up to £200 million, and the incident has been called the "largest burglary in English legal history." The heist was planned and carried out by four elderly men who were experienced thieves, all of whom pleaded guilty and received prison sentences in March 2016. Four men were also tried on suspicion of involvement; three were found guilty and sent to prison, while the fourth was cleared.

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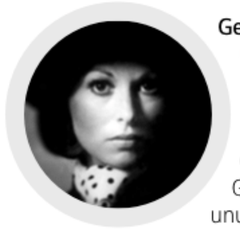
# Getaway driver

> I was driving on sidewalks, down alleys. I ducked into one alley, and then we saw the cops go by… It was intense. It was very intense. I got in pretty deep



**Georgia Durante's life** has taken some unexpected turns. She was a photographic model for Kodak, a "Kodak Girl"—who went on to work as a stunt driver. She was the stunt double for Cindy Crawford in a commercial for Pepsi. Going from modelling to television isn't unusual, but what Hollywood film crews didn't know was that in between, Durante's driving skills were honed during a career as a driver.

In her teens mobsters such as Carlos Gambino, and Sammy Giancana, took Durante under their wing. Durante's driving story began in New York City. She says she never knew exactly what went down at the after-hours club, but the intrigue drew her into the mafia's underworld. She said:

**"I'm there and 5 feet away from me, this guy pulls out a gun and shoots the guy next to him. Everybody scattered, the guy fell to the floor."**

Suddenly, the owner of Sundowners threw Durante a set of car keys. They put the man in the back of the car and Durante found herself in the driver's seat. They dropped the man off at the hospital, and Durante sped away.

**"I was driving on sidewalks, down alleys. I ducked into one alley, and then we saw the cops go by… It was intense. It was intense. I got in pretty deep."**

That incident earned her a reputation. She started off picking up and delivering packages to locations around the city. Then they moved her up to what were called "pickups." But when a mob war broke out, Durante knew she had to leave that lifestyle.

She wanted to take her daughter away from their abusive household, but she could never escape her husband. Then one day, she grabbed her daughter, got in the car and started driving. They ended up in Los Angeles; Durante arrived with only $7 in her wallet. She and her daughter lived out of their car and stole food from convenience stores. She desperately needed a job, but she had to lay low. And the only work experience she had came from modelling and driving cars.

Then it hit her: Every time she turned on the TV at her friend's house, she would see a car commercial. For someone on the run, it was perfect. At first, everyone ignored her. But Durante kept showing up.

**"Finally, they said, 'All right, we'll see what you can do.' And that was my big break," she says. "Before I knew it, I was turning down work. I was only one person. I couldn't do it all."**

**"If I would've taken no for an answer, who knows where I'd be now."**

ART DIRECTION FOR THE WEB BY ANDY CLARKE

# Getaway Driver

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I DUCKED INTO ONE ALLEY,
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ART DIRECTION FOR THE WEB BY ANDY CLARKE

# Three Elements of Good Design

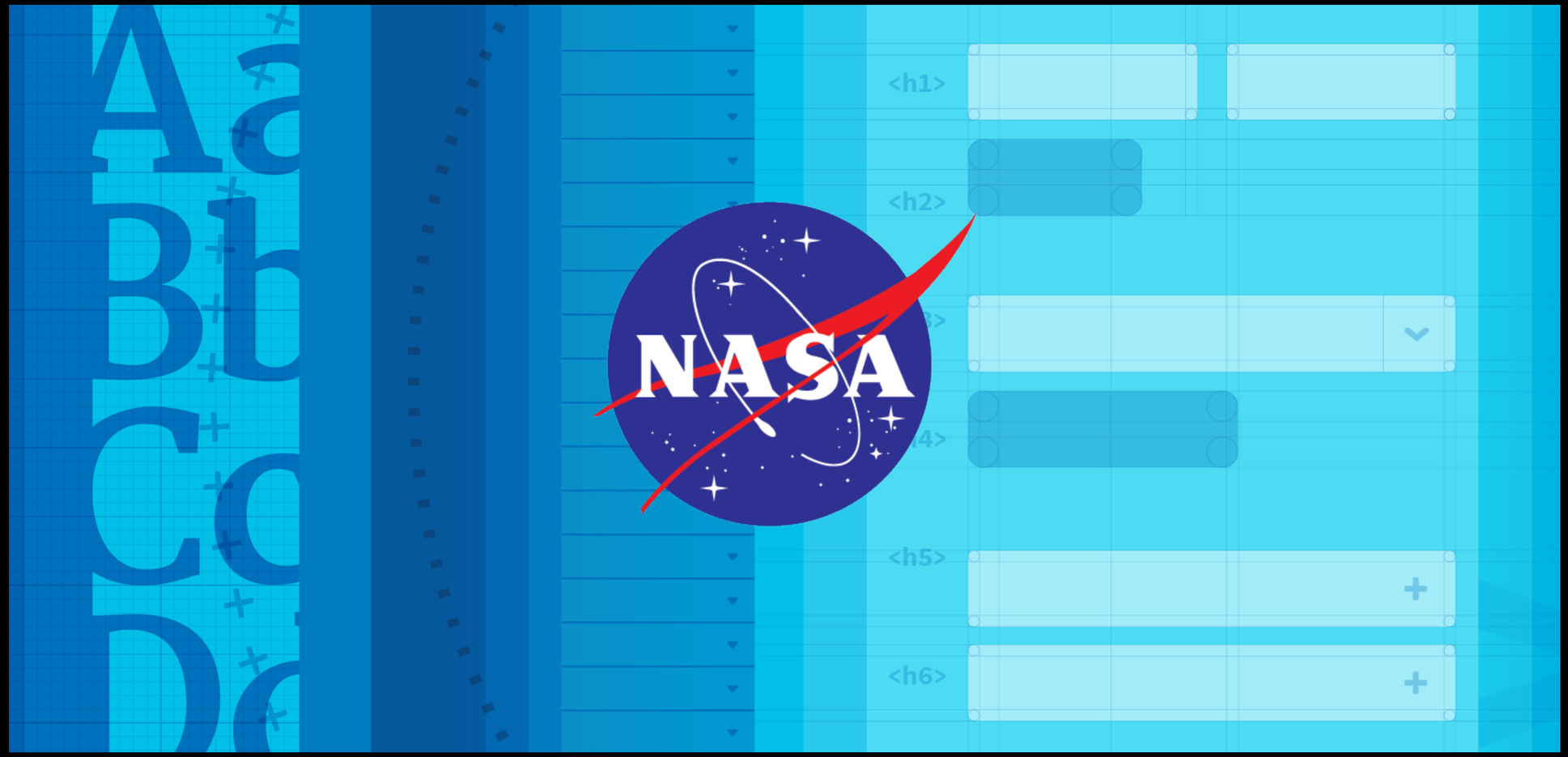
- Layout - CSS Grid and Flexbox
- Typography - Web Fonts
- Design systems

**“HTML and CSS are the fundamental technologies for building Web pages”**

***– W3C***

## Good looking sites can be accessible and fast loading.

With the new CSS we have a wonderful opportunity to bring editorial design to the web and with it a sense of control and craftmanship that I began with 20 years ago.




# NASA Web Design System

https://nasa.github.io/nasawds-site/

# My design principles

## Accessibility, Performance and Aesthetics

**“I hope we will use the Net to cross barriers and connect cultures.”**

***– Tim Berners-Lee***
***Inventor of the World Wide Web, 1989***

# Thank You.

https://speaking.scottgruber.me

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**Rachel Andrew's photo by Drew McLellan.**