

WEB ACCESSIBILITY

ALL THE BASICS

ABOUT ME

- My name is Jacob Reed
- Work as a web developer/project manager at the Marriott Library
 - Working with websites for ~15 years
- My email address is jacob.reed@utah.edu

WHAT IS WEB ACCESSIBILITY?

WEB ACCESSIBILITY IS SIMPLY
MAKING SURE EVERY ONE VISITING
YOUR WEBSITE OR USING YOUR APP
CAN UNDERSTAND, NAVIGATE, AND
USE YOUR STUFF.

WHY DESIGN WITH ACCESSIBILITY IN MIND?

- It's the right thing to do
- Sites built with accessibility in mind are more flexible and benefit all users
- A level of accessibility is legally obligated in some countries
- Accessible designs help with search engine optimization

THE NUMBERS

- ~1/5th of America has some disability¹
 - 10.8% for ages 21 to 64²
 - 25.8% for ages 65 to 74²
 - 50.7% for ages 75+²

¹ Nearly 1 in 5 People Have a Disability in the U.S. (2012, July 25). Retrieved September 16, 2015, from <https://www.census.gov/newsroom/releases/archives/miscellaneous/cb12-134.html>

² Erickson, W. Lee, C., & von Schrader, S. (2014). 2013 Disability Status Report: United States. Ithaca, NY: Cornell University Employment and Disability Institute (EDI).

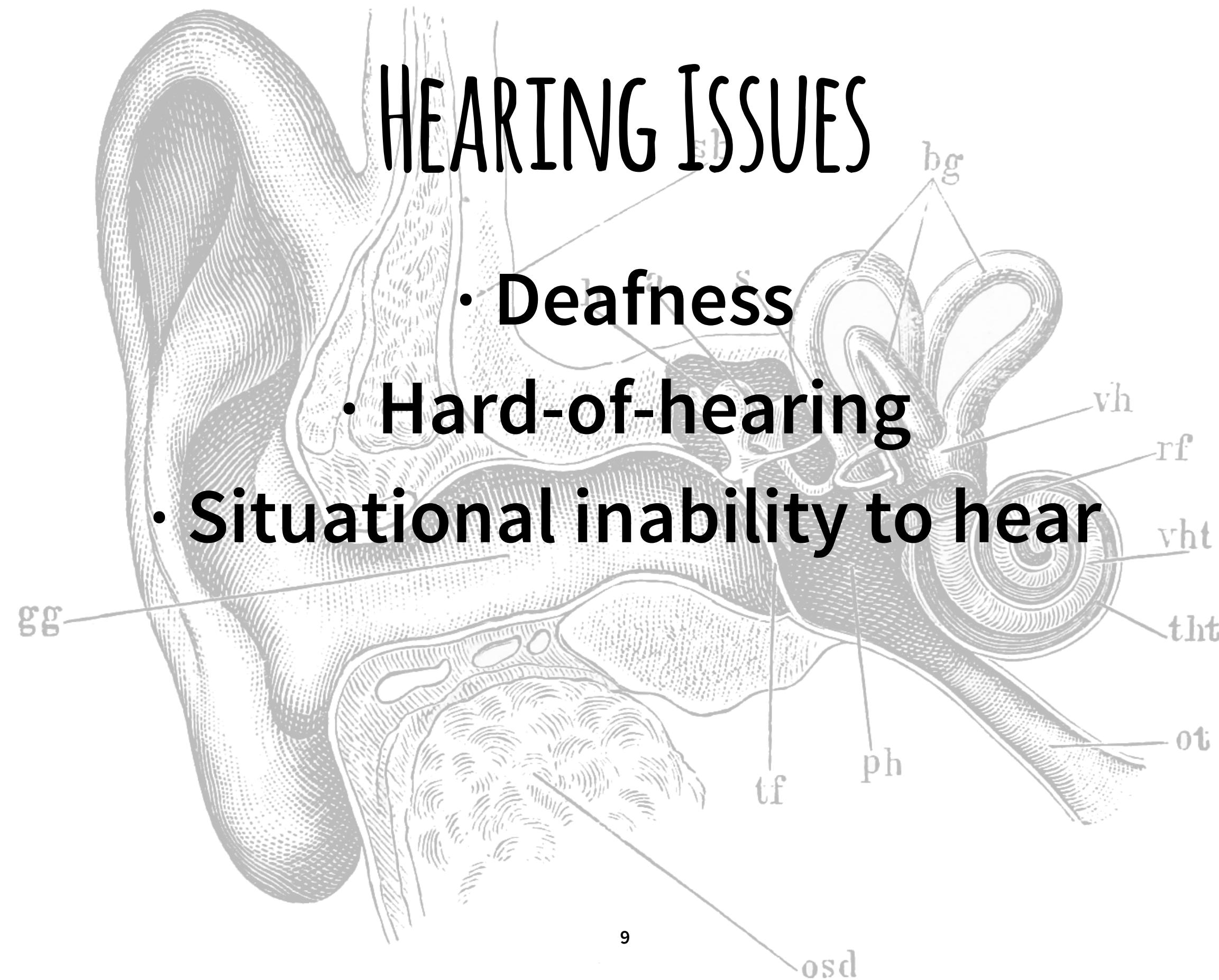
WHAT DOES WEB
ACCESSIBILITY LOOK TO
ADDRESS?

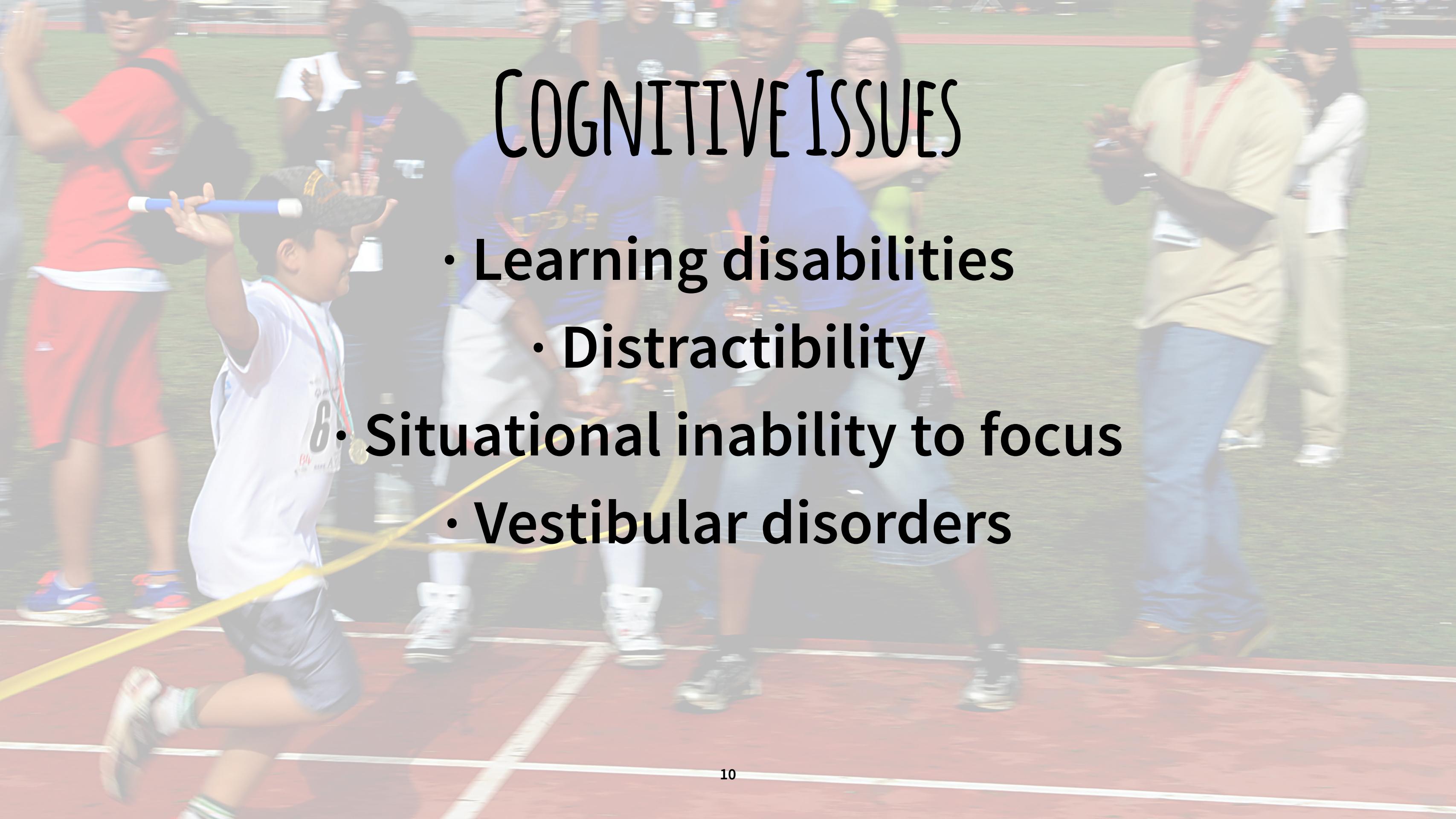
VISION ISSUES

- Blindness
- Low vision
- Color blindness
- Poor lighting conditions

HEARING ISSUES

- Deafness
- Hard-of-hearing
- Situational inability to hear





COGNITIVE ISSUES

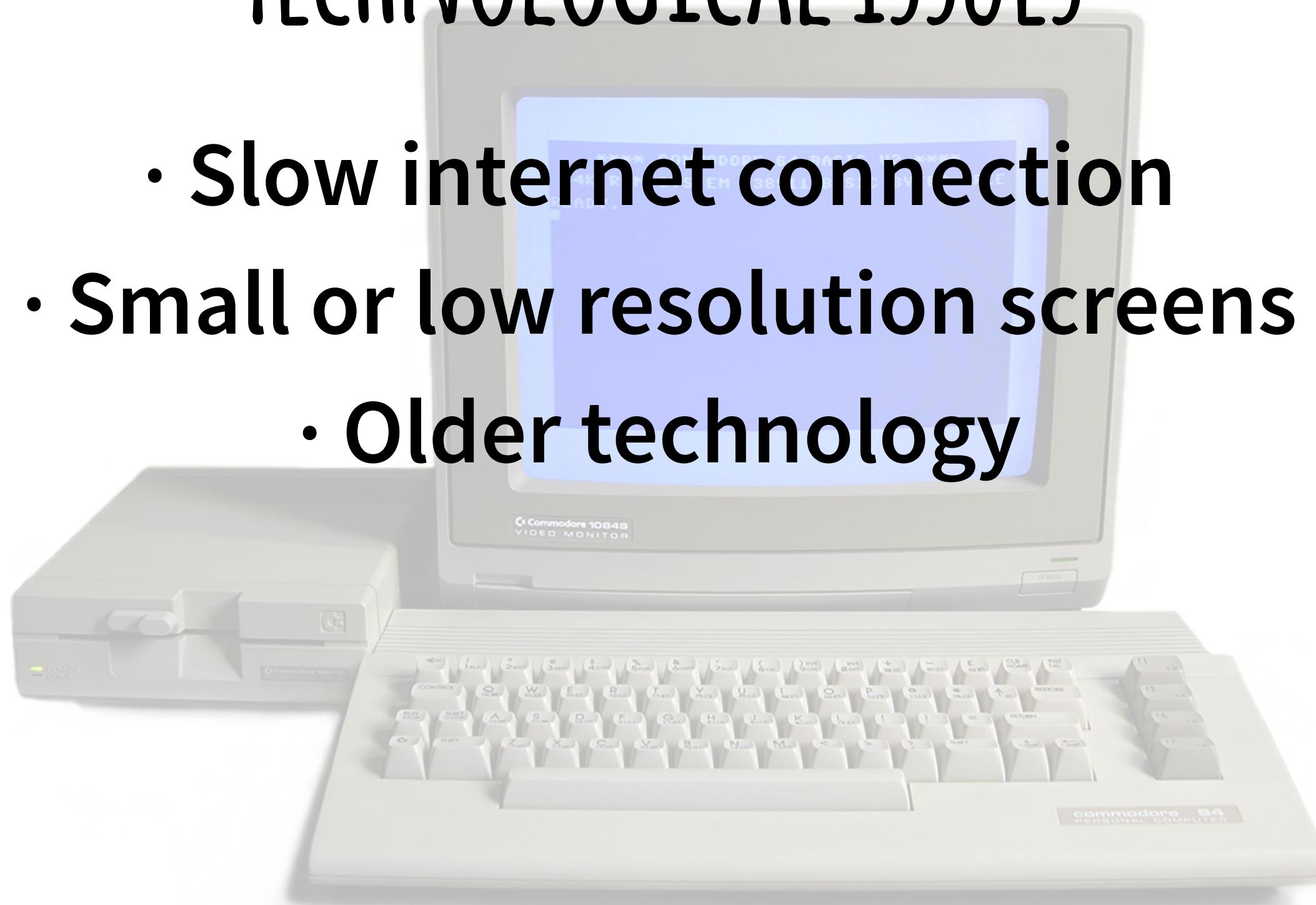
- Learning disabilities
 - Distractibility
- Situational inability to focus
 - Vestibular disorders

CHANGING OR TEMPORARY ISSUES

- The effects of age
- Temporary disabilities or injuries

TECHNOLOGICAL ISSUES

- Slow internet connection
- Small or low resolution screens
 - Older technology



CRISIS³



- Vague or unclear thinking
 - Stress
 - In a hurry

³ Eric Meyer gives a good summary this on The Web Ahead podcast (<http://5by5.tv/webahead/91>).

ACCESSIBILITY IS ABOUT EVERYONE

- Not just about long-term physical disabilities
 - Short-term & situational/environmental disabilities
 - Technological limitations and alternative devices
 - Convenience & Usability

ACCESSIBILITY ISN'T JUST
ABOUT CODE

Designing with Accessibility in Mind

POOR PLANNING =  + 

PLANNING YOUR DESIGN⁴

- Determine your goals & gather support
 - Develop & implement policies
 - Make sure someone is "in charge" of accessibility
- Review your tools & resources before use

⁴ <http://www.w3.org/WAI/impl/>

DESIGN EMPATHETICALLY

Don't just check off an "accessibility to-do"

Put yourself in the mind of your users

Make your website a great experience for all your visitors

RESPONSIVE DESIGN IS AN
ACCESSIBILITY CONCERN

WHAT IS RESPONSIVE DESIGN?

"[A]n approach to web design aimed at crafting sites to provide an optimal viewing and interaction experience ... across a wide range of devices"⁵

⁵ https://en.wikipedia.org/wiki/Responsive_web_design

BUILD RESPONSIVELY

Responsive design has become a must

Many developers use responsive designs without knowing they are making things more accessible

There are many frameworks available
(e.g. Bootstrap, Skeleton, and YAML 4)

TYPOGRAPHY

FONT SIZE

- Body text should be designed around 16px-20px
 - Relative sizing is better than absolute
 - Browsers will adjust to absolutes
 - Absolutes tend to be less flexible, can break designs on resize

FONT CONTRAST

- The difference between Headings & body text should be obvious
 - Same goes for bold vs. normal text

LINE LENGTH

Not too long (>75 characters)

Not too short (<45 characters)

Just right! (~66 characters)

(Especially an issue with responsive designs)

LINE SPACING

- Line spacing should be at least $\frac{1}{2}$ the height of the text
- Paragraph spacing should be set to $\sim 1.5 \times$ line height

AVOID TEXT JUSTIFICATION

- Creates "rivers" that make reading difficult
 - Especially bad for people with cognitive disabilities such as dyslexia

JUSTIFIED VS. LEFT ALIGNED

Justified (flush left and right)

Thy father was delighted and cried out to the servant, 'Give him a hundred and three gold pieces with a robe of honour!' The man obeyed his orders, and I awaited an auspicious moment, when I bled him; and he did not baulk me; nay he thanked me and I was also thanked and praised by all present. When the blood-letting was over I had no power to keep silence and asked him, 'By God, O my lord, what made thee say to the servant, Give him an hundred and three dinars?'; and he answered, 'One dinar was for the astrological observation, another for thy pleasant conversation, the third for the phlebotomisation, and the remaining hundred and the dress were for thy verses in my commendation.'" "May God show small mercy to my father," exclaimed I, "for knowing the like of thee."^[3]

Flush left, ragged right

Thy father was delighted and cried out to the servant, 'Give him a hundred and three gold pieces with a robe of honour!' The man obeyed his orders, and I awaited an auspicious moment, when I bled him; and he did not baulk me; nay he thanked me and I was also thanked and praised by all present. When the blood-letting was over I had no power to keep silence and asked him, 'By God, O my lord, what made thee say to the servant, Give him an hundred and three dinars?'; and he answered, 'One dinar was for the astrological observation, another for thy pleasant conversation, the third for the phlebotomisation, and the remaining hundred and the dress were for thy verses in my commendation.'" "May God show small mercy to my father," exclaimed I, "for knowing the like of thee."^[3]



COLOR

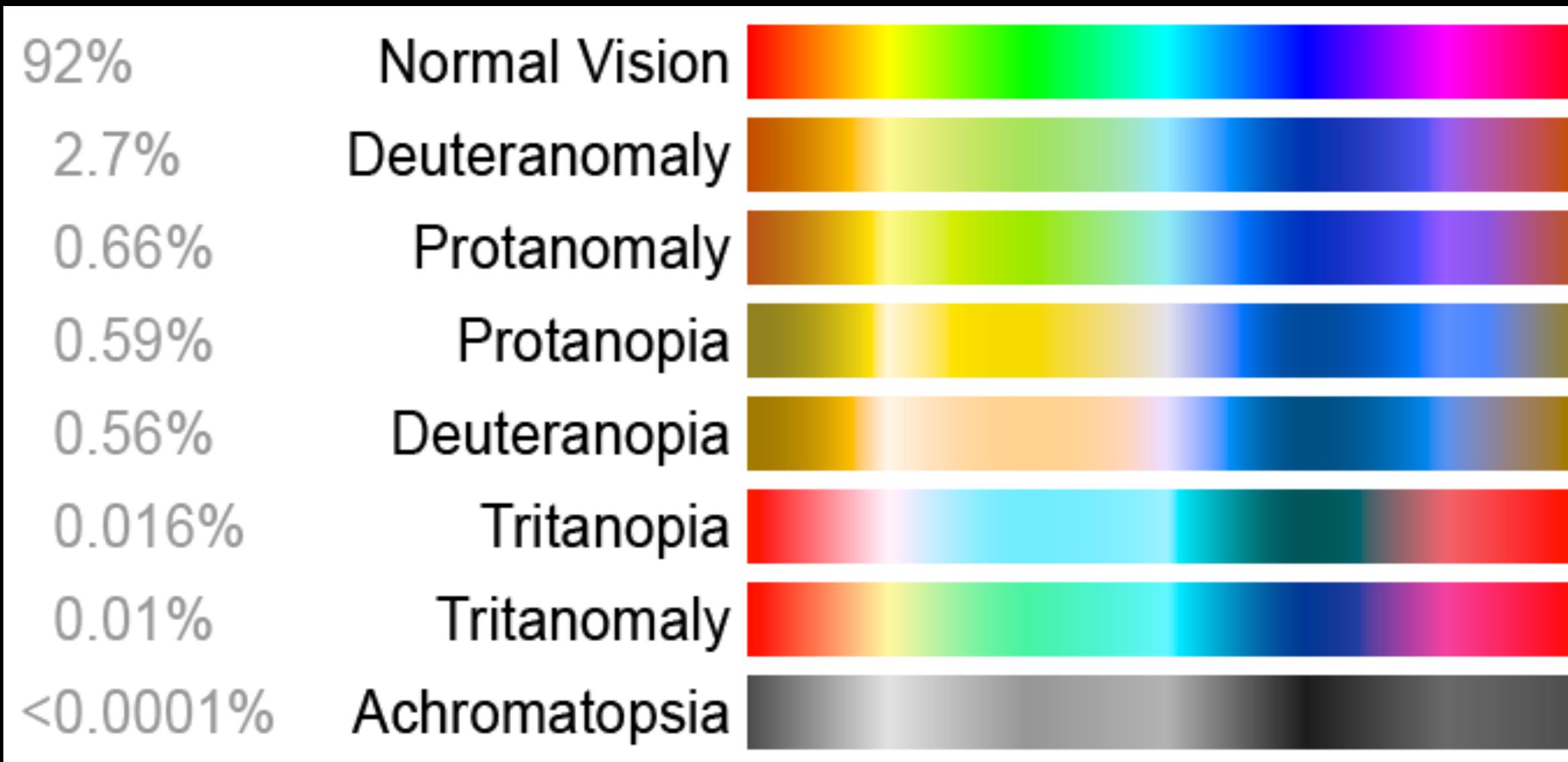
COLOR & CONTEXT

You shouldn't rely solely on color to convey meaning⁶

This mistake used to happen a lot with forms

⁶ <http://webaim.org/intro/>

COLOR BLINDNESS



COLOR CONTRAST

- Make sure colors have enough contrast
- W3C recommends a contrast ratio $\geq 4.5:1$ ⁷
- There are a lot of tools available to test this

⁷ <http://www.w3.org/TR/WCAG20/>

COLOR CONTRAST

Proper use of color addresses many issues:

- Vision problems
- Technological issues
- Poor lighting

IN DOUBT?

- WebAIM's Color Contrast Checker⁸
- Colour Contrast Analyser⁹

⁸ Available at <http://webaim.org/resources/contrastchecker/>

⁹ Available at <https://www.paciellogroup.com/resources/contrastanalyser/>

IN SUMMARY

- You should design with empathy for your user
 - Accessibility should be part of your initial planning
 - Responsive design is a must
 - Both color and typography play vital roles in accessible designs

CODING WITH ACCESSIBILITY IN MIND

DOCUMENT STRUCTURING

STRUCTURING IS WHERE ACCESSIBLE DESIGNS START

- HTML should be logically organized.
- If your page has no css, it should still make sense and have valid hierarchy.

HTML HEADINGS PROVIDE THE ASSISTIVE TECHNOLOGY OUTLINE

When scanning your site, assistive technologies use your heading structure to map out the page.

<h2>s should be underneath <h1>s, etc.

Avoid skipping heading levels.

Use CSS to make your headings look appropriate.

FLOATS

Write content in the order you want the material read and float accordingly

```
<section id="main_content">  
    Lorem ipsum dolor sit amet, quo et tollit maluisset, enim  
    assentior eu ius. His amet probo ubique an, falli sensibus  
    corrumpit est id. Prodesset efficiendi in vis, his et aeque  
    ludus. Ne vix oblique quaerendum, ei dicat epicuri abhorreant  
    eum.  
</section>  
<section class="side_content" style="float:left;">  
    Quem perfecto mea ei, wisi voluptaria qui at. Id aperiri labores  
    neglegentur has. Esse nibh semper usu at, vivendum urbanitas pri ne.  
</section>
```

IMAGE ALTERNATIVE TEXT¹⁰

¹⁰ Most of these examples were derived from WebAIM (<http://webaim.org/techniques/alttext>). Check out their article for additional information.

- Typically the first accessibility tool learned
 - Used improperly a lot of the time
 - Plan your "alts" around context

Providing Context¹¹

```
<section class="bio">
  
  <p>
    Beginning her career as a warrant officer with
    Weyland-Yutani's commercial freight operations,
    Ellen Louise Ripley was assigned to the USCSS
    Nostromo in 2122 when it encountered a single
    Xenomorph unintentionally collected from the
    planetoid LV-426.
  </p>
</section>
```



¹¹ http://avp.wikia.com/wiki/Ellen_Ripley

Context Given or Unnecessary¹²

```
<section class="bio">
  
  <strong>Arthur Dallas</strong>
  
  <p>
    After attending high school in his home town,
    Arthur Dallas studied engineering at Beilecki
    University's Martian campus, eventually
    graduating with a Bachelors degree.
  </p>
</section>
```



¹² http://avp.wikia.com/wiki/Arthur_Dallas

"Alts" and Links



```
<!-- Context Needed -->
<p>
<a href="https://en.wikipedia.org/wiki/Harry_Dean_Stanton">
  
</a>
</p>

<!-- Context Present -->
<p>
<a href="https://en.wikipedia.org/wiki/Harry_Dean_Stanton">
  
  <strong>Harry Dean Stanton</strong>
</a>
</p>
```

OTHER CASES

- The "alt" on form-submit images should describe the form action, not the image.

```
<input type="image" src="right-arrow-submit.gif" alt="Submit">
```

- Background images should not provide context.

OTHER CASES (CONT.)

- If an image has been broken up into multiple parts, "alt" content should be included on the most prominent part.
- alt="[COMPANY NAME]" is usually considered appropriate for a company logo in the top banner.

LONG DESCRIPTIONS

- The "longdesc" attribute is a great tool for adding detailed information, HOWEVER...
 - Support for this attribute is not great
- Primarily used by JAWS and NVDA on IE and Firefox¹³

¹³ Support testing information available at <http://webaim.org/techniques/alttext/longdesctestcases.htm>.

MAKE LONG DESCRIPTIONS WORK FOR EVERYONE

When using this attribute, provide a link to the description so that it's available to all.¹⁴

```
<br>  
<a href="salesdata.htm">View sales data</a>
```

¹⁴ Sample code provided by WebAIM (<http://webaim.org/techniques/alttext/>).

WAI-ARIA

WEB ACCESSIBILITY INITIATIVE –
ACCESSIBLE RICH INTERNET
APPLICATIONS

WHAT'S THAT!?

ARIA is a set of attributes, created by the W3C, to help assistive technologies.

Web applications utilize AJAX, HTML, and JavaScript in ways that screen readers often don't understand.

ARIA attempts to bridge that gap.

HOW DOES IT WORK?

ARIA uses "roles," "states," and "properties" to give browsers and assistive technologies additional information

"ROLES," "STATES," AND "PROPERTIES"

"Roles" tell a browser that an HTML element is functioning in a specific, non-traditional manner

"States" and "properties" define the state of a current element (e.g. checked, hidden, collapsed)

ARIA AND FORMS (REQUIRED FIELDS)

```
<label for="email">  
  Email Address <span class="req">*</span>  
</label>  
<input id="email" type="email" aria-required="true">
```

ARIA AND FORMS (LABELLING)¹⁵

Name	Office Number	Phone
Cyndi	<input aria-label="Cyndi's office number" type="text" value=""/>	<input type="text"/>
Jared	<input type="text"/>	<input type="text"/>
Jonathan	<input type="text"/>	<input type="text"/>

`<th id="officenum" scope="col">Office Number</th>`

The HTML for the first text field within the table is:

`<input type="text" name="office1" aria-labelledby="cyndi officenum">`

¹⁵ <http://webaim.org/techniques/forms/advanced>

ARIA AND FORMS (DESCRIBING)¹⁶

Reset Password:

New password must be 8-15 characters and include letters and numbers

```
<label for="resetpass">Reset Password:</label>
<input type="password" name="resetpass" id="resetpass" aria-describedby="newpass">
<br>
<span id="newpass">New password must be 8-15 characters and include
letters and numbers</span>
```

¹⁶ <http://webaim.org/techniques/forms/advanced>

RANDOM FORM

Wufoo

Welcome to Wufoo Account Creation!

Every journey starts somewhere. This journey starts here.

Email Address *
So we can get a hold of you.

Password *
Like a secret agent.

Account URL *
Your one word nickname.

Read & Agree *
So we're on the same page.

Don't worry. This info is sacred to us. We won't ever sell or abuse it.

At least 6 characters long. Once more to verify, please.

http:// **username**.wufuu.com

Keep me updated about Wufoo projects.
 I agree to Wufoo's [Terms of Service](#).

[Create Account](#) [Cancel](#)

WHAT ARIA ISN'T

ARIA is a toolset for adding accessibility information; it's not a silver bullet.

ARIA doesn't influence browser behavior.

Accessibility first should still be your goal.

APPLYING ACCESSIBILITY TECHNIQUES
TO AN UNUSABLE SITE IS LIKE
PUTTING LIPSTICK ON A PIG.

NO MATTER HOW MUCH YOU APPLY, IT
WILL ALWAYS BE A PIG.

— Jared Smith, WebAIM¹⁷

¹⁷ <http://webaim.org/blog/accessibility-lipstick-on-a-usability-pig/>

MAKE SURE YOUR APPLICATIONS ARE
DESIGNED TO FUNCTION ACCESSIBLY

Always Set the Language Attribute

```
<!-- For the page itself... -->
```

```
<html lang="en">
```

```
...
```

```
<!-- and for alternate languages within a page. -->
```

```
<blockquote lang="fr">
```

```
  Il faut réfléchir avant d'agir. Vaut mieux prévenir que guérir.
```

```
</blockquote>
```

```
...
```

```
</html>
```

:FOCUS & :ACTIVE

Keyboard and assistive technology users rely on the CSS :focus & :active attributes .

Browsers will handle these attributes properly if the attributes haven't been disabled.

Feel free to style :focus and :active to make them match your design and create cross-platform consistency.

Avoid Generic Text in Links

```
<!-- Screen readers will state "Read More" repeatedly for each instance. -->  
Lorem ipsum dolor sit amet, quo et tollit maluisset, enim assentior eu ius. His  
amet probo ubique an, falli sensibus corrumpit est id. Prodesset efficiendi  
in vis, his et aequa ludus. Ne vix oblique quaerendum, ei dicat epicuri  
abhorreant eum. Pro dissentias interesset ad, no error nominavi pri.
```

```
<a href="services.html">
```

Read More

```
</a>
```

```
<!-- Instead use descriptive text -->
```

```
<a href="services.html">
```

Read More About Our Services

```
</a>
```

You Can Use CSS to Obscure Details¹⁸

```
<!--index.html-->
<a href="#">
  Read More <span class="offscreen">About NC State</span>
</a>
```

```
/*my_style.css*/
.offscreen {
  position: absolute;
  left: -9999px;
  width: 1px;
  height: 1px;
  top: auto;
}
```

¹⁸ <http://accessibility.oit.ncsu.edu/blog/2012/01/12/accessible-read-more-links/>

ANOTHER EXAMPLE OF HIDDEN CONTENT USAGE

```
<!-- Assistive technology options -->
<div class="offscreen">
  <!-- Skip to main option -->
  <a href="#main_content">Skip to Main Content</a>
  <!-- Navbar labeling -->
  <h1>Main Navigation Bar</h1>
</div>
<!-- Main navigation bar -->
<nav class="navbar navbar-default">
```

AUDIO-VISUAL

- Proper captioning is an important step when creating video content.¹⁹
- Having a transcript of your content will come in handy.

¹⁹ Accessify YouTube Caption Creator is a great tool for YouTube content
<http://accessify.com/tools-and-wizards/accessibility-tools/easy-youtube-caption-creator/>

GUIDELINES & REGULATIONS

WEB CONTENT ACCESSIBILITY GUIDELINES (WCAG 2.0)²⁰

WCAG is a set of guidelines, created by the W3C, meant to determine whether a website is accessible to people with disabilities.

WCAG isn't a law, but it's usually sets the context for accessibility discussions

²⁰ Overview of WCAG available at <http://www.w3.org/WAI/intro/wcag>

SECTION 508

Section 508 Amendment to the Rehabilitation Act of 1973 are a set of regulations that bar the Federal government from buying electronic and goods and services that aren't accessible to people with disabilities.

NON-U.S. REGULATIONS

Many other governments are starting to mandate levels of accessibility for online content.

Almost all of these regulations closely mirror WCAG 2.0 guidelines.

ACCESSIBILITY TESTING

- Remove CSS and see if your site makes sense
 - Navigate your site with just your keyboard
- Download the JAWS demo or NVDA (Windows)
 - Turn on VoiceOver (Mac or iOS)
- Checkout the many tools available to audit and automate testing

USEFUL TOOLS

- TinyPNG – <https://tinypng.com>
- WebAIM Color Contrast Checker – <http://webaim.org/resources/contrastchecker/>
- Accessify YouTube Caption Creator – <http://accessify.com/tools-and-wizards/accessibility-tools/easy-youtube-caption-creator/>

MORE USEFUL TOOLS

- Bootstrap Responsive Framework – <http://getbootstrap.com/>
- Bootstrap Accessibility Plugin – <https://paypal.github.io/bootstrap-accessibility-plugin/>
- WAVE accessibility tool - <http://wave.webaim.org/>

EVEN MORE USEFUL TOOLS

- Colour Contrast Analyser - <https://www.paciellogroup.com/resources/contrastanalyser/>
- Accessibility Developer Tools – <https://chrome.google.com/webstore/detail/accessibility-developer-t/fpkknkljclfencbdbgkenhalefipecmb/>

QUESTIONS!