Accessibility

**Definition**
- Accessibility - The Web site design guidelines that enable people with disabilities to access and use Web sites with special tools, such as screen readers.

**Disabilities that can Affect Web Experience**
- Visual impairments
  - Low vision
  - Blindness
  - Color blindness/deficiencies
- Hearing impairments
- Mobility impairments
- Cognitive impairments

**Screen Readers**
- Software that reads the computer screen to blind or severely visually impaired users
- Keyboard commands move users from one element to the next
- Elements include links, images, and text
Other Assistive Technologies used with the Web

- For limited mobility:
  - Mouth stick
  - Head pointer
- For tremors/limited fine motor skills:
  - Users often use keyboards rather than mice
- For blurry or low vision:
  - Magnifying software
- For blindness:
  - Braille displays
- For cognitive impairments (and many others):
  - Speech synthesizers

Guidelines and Laws

- Web Content Accessibility Guide (WCAG)
  - A set of accessibility guidelines
  - Developed by the Web Accessibility Initiative (WAI) – a W3C working group
  - Used worldwide
- Section 508
  - Federal (US) guidelines for accessibility
  - Based on WCAG
- Americans with Disabilities Act
  - Public places cannot discriminate against users with disabilities
  - ADA laws are starting to be applied to web sites

The “Text-Only” Myth

- Some sites offer separate, text-only versions
- Separate is not equal
  - Text-only sites are often forgotten in updates
  - Images often convey meaning
  - Blind people may surf with sighted friends
  - Text-only sites only assist visually impaired users, other disabilities are not addressed

WCAG 1.0 Guidelines

- Web Accessibility Initiative (WAI) is a W3C-led movement to ensure accessibility of Web sites
- WAI created the Web Content Accessibility Guidelines (WCAG)
  - Offers 14 guidelines for making sites accessible to users with disabilities
  - Each guideline has checkpoints that are assigned a priority level (1-3)
  - Each checkpoint provides specific techniques for designers to follow
WCAG 1.0 Guidelines

- Organized as follows:
  - Guideline 1
    - Priority 1
      - Checkpoint (each priority level may have zero or several checkpoints)
    - Priority 2
      - Checkpoint
    - Priority 3
      - Checkpoint
  - Repeat for the other 14 Guidelines

Priority Levels

- Priority 1
  - Web designers must satisfy these checkpoints
  - Includes the most basic requirements for accommodating users with disabilities
- Priority 2
  - Web designers should satisfy these checkpoints
  - Removes significant barriers
- Priority 3
  - Web designers may satisfy these checkpoints
  - Highly improved access for users with disabilities

Guideline 1: Provide alternatives to auditory and visual content

- Priority 1 Checkpoints:
  - Provide a text equivalent for every non-text element (images, audio, video)
  - Provide text links for all clickable areas of an image map
  - Provide audio description of a video track
  - Provide captioning for an audio track

***Note: This presentation only includes checkpoints relative to topics we have covered or will cover. Complete list can be found here: http://www.w3.org/TR/WCAG10/.

Guideline 1 and Alt Attributes

- Defined in your image tag:
  <img src="computer.jpg" alt="Dell Inspiron 300m laptop" />
- Every image must have an alt attribute
- Screen reader will read alt text aloud
- If you do not include an alt attribute, screen reader will read the image name and filepath (ex. http://www.school.com/images/spacer.gif)
Guideline 1 and Alt Attributes

- Sum up the contents of the image (5-10 words)
- Do not state that it is an image or picture
- If the graphic includes text, alt should repeat it
- In image maps, assign alt text to each clickable area
- If image has no meaning, include alt attribute but leave the quotes empty – screen readers will skip it:
  - `<img src="corner.jpg" alt="" />`

Guideline 2: Don't rely on color alone

- Priority 1 Checkpoint:
  - Ensure that information conveyed with color can also be understood based on context
- Priority 2 Checkpoint:
  - Make sure that foreground and background colors provide sufficient contrast

Guideline 2 and Color

- Consider color-deficient users
  - Color blind people don’t see in grayscale
  - Red and green are most common deficiencies
  - Blue is the least common deficiency

Normal vision: Red/green deficiencies:

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Guideline 2 and Color

- Online color deficiency simulator: http://www.vischeck.com/vischeckURL.php (limited support for CSS)
- Pages will never look the same to people who have color deficiencies
- When color conveys meaning, information must be accessible to color deficient users
**Guideline 3: Use markup and style sheets and do so properly**
- There aren’t any P1 checkpoints for Guideline 3
- Priority 2 Checkpoints:
  - When possible, use markup rather than images to convey information
  - Use style sheets to control layout and design
  - Use relative units of measurement (em or percent) rather than absolute (pt or px)
  - Use head tags (h1, h2...) for document structure, not to control font size
  - Markup lists properly
  - Use the blockquote tag only around long quotes

**Guideline 3 and Font Size**
- Accessibility standards mainly target people who use assistive technology
- Screen readers can read tiny text, so font sizes are not specifically a part of accessibility standards
- But… consider users with poor or strained vision!
  - Relative units of measurement can help
  - Using larger sized fonts can help

**Guideline 4: Clarify natural language usage**
- Screen readers can switch from one language to another, provided you identify the language
- Priority 1 Checkpoint:
  - Clearly identify any changes to the language
  - Example: `<p>A man said, <span lang="es">"Hola, amiga! Usted tienen gusto de comprar un pollo?"</span></p>`
- Identifying natural language of the document is Priority 3, but required for XHTML Strict

**Guideline 5: Create tables that transform gracefully**
- Priority 1 Checkpoints:
  - Identify row and column headers
  - Use markup to define when a table's row and column headers span more than one row/col
- Priority 2 Checkpoints:
  - Don't use tables for layout unless content makes sense in a linear order
  - If a table is used for layout, do not use row/column headers (or other logical markup)
Guideline 6: Ensure that pages w/ new technologies transform gracefully

- Pages should at least function in older browsers
- Priority 1 Checkpoints:
  - Organize content so that it can be read and understood without the style sheet (use CSS menu in Web Dev toolbar to disable styles for testing)
  - Ensure that pages can be read if user has set browser to disable scripts

Guideline 7: Ensure user control of time-sensitive content changes

- Priority 1 Checkpoints:
  - Avoid causing the screen to flicker (4 to 59 flickers per second can cause seizures)
- Priority 2 Checkpoints:
  - Avoid causing the screen to blink repeatedly
  - Avoid movement on screen
- Note: If user can control flickering / blinking / movement, it is okay to include it

Guideline 9: Design for device independence

- Design pages so elements can be accessed and activated by a variety of devices
- Priority 3 Checkpoints:
  - Specify tab order through links and form fields
  - Provide keyboard shortcuts to main navigation links

- Note: Guideline 8 has to do with embedded programs (ex. games that appear within web pages) which is beyond the scope of CIOS157

Guideline 10: Use interim solutions

- These checkpoints apply until assistive technologies (ATs) and browsers make changes
- Priority 2 Checkpoints:
  - Do not use pop-up windows…
    - …until browsers/ATs can tell users that new windows have opened
  - Ensure that form labels are positioned near their related fields…
    - …until browsers/ATs understand the HTML markup code that associates a label with its field
Guideline 11: Use W3C Guidelines and Technologies

- Priority 1 Checkpoint:
  - If (after a concerted effort) you are unable to make a page accessible, create an alternate page that contains equivalent information
  - Avoid deprecated tags

Guideline 12: Provide context and orientation information

- Priority 1 Checkpoints
  - Title every frame
- Priority 2 Checkpoints
  - Describe the purpose of each frame if titles do not make it evident
  - Divide large blocks of text into manageable groups (information chunking)
  - Use markup to associate form labels and fields

Guideline 12 and Information Chunking

- For several cognitive impairments, long blocks of text can be intimidating
- Use “information chunking”
  - Headings to separate page into manageable sections
  - Short blocks of text (paragraphs)
  - Lists when appropriate
  - White space
  - Appropriate, concise language

Guidelines 13 and 14

- 13: Provide clear navigation mechanisms
  - Priority 2 Checkpoints:
    - Clearly identify the target of links
    - Use navigation mechanisms in a consistent manner
- 14: Ensure that documents are clear and simple
  - Priority 1 Checkpoint:
    - Use clearest/simples language for the site’s content
**Guideline 13 and Links**

- Screen readers can jump from one link to the next, skipping the words that surround them.
- Link text should describe where it goes.
  - University of Alaska Southeast not Click here for more information
- Indicate when a link will open a non-html file or large file:
  - No Child Left Behind: A Toolkit for Teachers PDF (2.3mb)

**WCAG 2.0**

- Released December, 2008
- Written in broader terms - not technology specific
- Extremely complex rules are difficult for even experienced designers to interpret
  (for more info, see "To Hell With WCAG 2.0": http://www.alistapart.com/articles/tohellwithwcag2)
- As beginners, WCAG 1.0 guidelines are a decent starting point toward understanding accessibility

**Guideline 13 and Links**

- Dozens of navigation links can be a problem.
  - Screen readers painstakingly read them all
  - Mobility impaired “switch” users have to tab through them all
- Pare them down or create a link at the top of your page that links to your content (“skip navigation”)
- For mobility impaired people (mouse users)
  - Tiny link buttons can be difficult to get to
  - Multiple level (or small) drop down menus can be difficult to operate

**Section 508**

- Section 508 refers to an amendment of the Rehabilitation Act of 1973
  - Rehab Act – prohibits discrimination on the basis of disability in:
    - Federal agencies
    - Federally funded programs
    - Federal contractors
  - Section 508 amendment in 1998 updated guidelines to apply to electronic resources
Section 508 vs. WCAG

- WCAG and Section 508 guidelines are similar
- WCAG has been adopted by European Union
- WCAG is more globally accepted
- WCAG is more thorough
  - If your site meets WCAG standards, it is highly likely to meet Section 508
- Comparison of guidelines: [http://www.jimthatcher.com/sidebyside.htm](http://www.jimthatcher.com/sidebyside.htm)

Validation

- Firefox Web Developer's toolbar validators:
  - Tools => Validate Section 508
  - Tools => Validate WAI (use for this class)
- Validators only evaluate a few key points – cannot evaluate things like:
  - Whether two colors have enough contrast
  - Whether alt attributes accurately describe the image
- Things that can’t be evaluated by the validator generate warnings that you need to check manually

Reading the Reports

- Go to [http://www.google.com](http://www.google.com)
- From the Web Developer's Toolbar: Tools => Validate WAI
- Results are divided into 3 priorities w/ subcategories
- Subcategories relevant to this class include:
  - Basic
  - Image Maps
  - Tables
  - Frames
  - Forms
- Must satisfy Priority 1 at a minimum (for this class)
- Most parts of the report are things that YOU need to check – cannot be evaluated by machine