

Project 2: Build An Accessible Web Page

Lab Notebook

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Accessibility Evaluation

There are 5 main problems:

1. **Missing alternative text for both images and videos:** Most of the errors that WAVE is able to detect are for missing alternative text, mainly for images.
2. **Missing form labels:** There's a form for signing up for subscription, however, none of the form fields are labeled. This would be especially confusing since the form is asking for different parts of name in different text boxes.
3. **Broken same-page links:** The home page link is broken, which is very inconvenient. Usually people would click on it a lot.
4. **Lack of heading structure:** WAVE also suggests that there are no heading structures. However, the website does have a nav bar with headings: "Home", "Links" and "Sign up", which I think would be very helpful as headings.
5. **Very small text:** WAVE also suggests that there is very small text. However, I couldn't find it without looking at the HTML code.

The image displays two screenshots of the WAVE (Web Accessibility Evaluation Tool) interface. The left screenshot shows the 'Summary' panel, which provides a high-level overview of the accessibility issues detected. It lists 10 Errors, 4 Alerts, 4 Features, 0 Structural Elements, 1 HTML5 and ARIA issue, and 4 Contrast Errors. The right screenshot shows the 'Details' panel, which provides a more granular view of the specific issues. It lists 10 Errors (1 X Missing alternative text, 3 X Linked image missing alternative text, 5 X Missing form label, 1 X Document language missing) and 4 Alerts (1 X No heading structure, 1 X Broken same-page link, 1 X Tabindex, 1 X Very small text). It also lists 4 Features (4 X Alternative text) and 1 HTML5 and ARIA issue (1 X HTML5 video or audio).

Improvement Details



Headings and Landmarks

The severity of this problem is speechless: there are no heading structures at all. There is a banner indicating that the main topic of this website is “accessibility overview”, however, there should be a heading suggesting so as well. The lack of headings is detected by WAVE and the following changes do reflect on positive result.



CHANGES

- Editing “Links” and “Sign Up” to be h2 headings
- Adding landmarks such as main, navigation and banner

Structural Elements (3)

 1 X Heading level 1 



 2 X Heading level 2 



Good Alternative Text for Images

Missing alternative text in my opinion is the biggest problem of this website and definitely requires a lot of changes. The video and many images lack alternative text. The dot images in front of the links do have alternative text, but are not particularly useful. This problem is reflected on WAVE report and the following changes result in less errors and more features.

CHANGES

- Adding alternative text “Employment Movie” to the video and “Play” to the image of a play button
- Adding alternative text to navigation pictures “Home”, “Links” and “Sign up”

Features (8)

 5 X Alternative text 

 3 X Linked image with alternative text 

Form Labels

The sign-up form lacks label for all of its fields. Without form labels, it's very hard for people who are viewing the page with a different layout. Having form labels also allow the user to click on the label itself to set focus to the form element. For this particular page which asks for first name, middle initial, and last name as different fields, it's even more crucial to set labels for them separately. This problem is detected by WAVE successfully and changes to it result in positive feedback.

CHANGES

- Adding form labels for all the field to match the input id
- Adding id for “comments” textarea field

 5 X Form label 

Form Widgets without Semantics

There are two significant problems on the website in terms of using widgets. It's a severe issue because for users who rely on tools like screen reader to read the website would not be able to tell what the object is and what state it's in at all. On the original website, both the play button for the video and the checkbox have their "true identity" hidden to the user. To the HTML, they are both just images. However, they are actually being manipulated by javascript to change the state of the video and checkbox, respectively. This problem is not detected by WAVE.

CHANGES

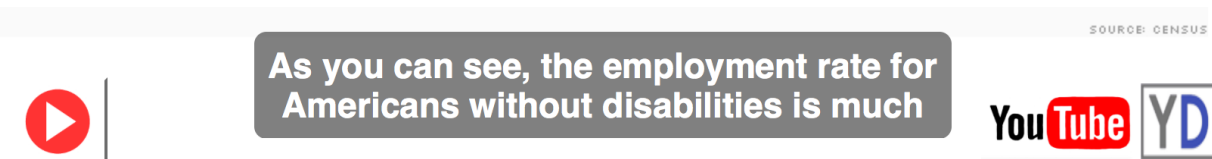
- Getting rid of the hidden unchecked image, using "aria-check" tag to indicate whether the box is checked or not, setting the "role" to checkbox, setting "tabindex" to 0
- Adding javascript to modify the "aria-check" state of the checkbox
- Changing the format of the play button to a button instead of just span, using "aria-pressed" to indicate whether the button is pressed, setting the "role" to button, set "tabindex" to 0
- Adding javascript to modify the "aria-pressed" state of the button

Video Captions

The employment video does not have captions and it'd be hard for an user with hearing disabilities to know what the video is about. This problem is not detected by WAVE but is a very severe problem because in a real world scenario, a video can convey so much information and missing it can result in many consequences. Note: subtitles can only display on Safari, not Chrome, because Chrome blocks instructions on loading local files from "file://" origin for safety purposes. I spent a while trying to run the website on a server and using webpack configuration etc., but unfortunately it seems like it's just much easier to load it on Safari.

CHANGES

- Adding subtitle to the video with a track element (the subtitle is generated by editing the YouTube auto-generate subtitle function)
- Adding a link to the uploaded YouTube video due to higher functionalities such as full-screen and possibly more subtitles



Audio Descriptions

There are no audio descriptions available for users who have trouble watching the video. This problem is as severe as the one above. This problem is not detected by WAVE. To solve this problem, both audio descriptions as well as text descriptions should be provided to the user.

CHANGES

- Providing a link to the video with audio descriptions
- Adding description as well as subtitles to a separate text file

Tab Order & Visible Focus

Tab order issue is a very important one for people who only have access to keyboard but is not detected by WAVE. Without knowing what the current focus is on and being able to tab through everything clickable is very frustrating.

CHANGES

- Changing tabindex to 0 span and div elements that need to be tabbed through
- Adding focus CSS style for visible focus for links, buttons and text input fields

Sign Up!

Name

First Name: Middle Initial: Last Name:

Email

Subscription

Would you like to receive occasional emails with offers from us?

☒

Color Contrast

The links are all in grey color as specified by CSS. This is detected by WAVE. This is a mildly severe issue because the contrast is not super low (the contrast ratio was 3.95:1 for grey). However, it can definitely be improved. The low color contrast in images like the banner is not detected by WAVE, which shouldn't be overseen.

CHANGES

- Changing link CSS to #0000ff which has contrast 8.59:1 with white background
- Changing the color of the text on the banner

Resources

- [Accessibility Research at CMU](#)
- [Disability Services at CMU](#)
 - [Hamster Dance](#)

Keyboard Access

Keyboard Access was a very severe issue because the user couldn't select the checkbox with either the enter key nor the spacebar due to browser configurations. There were also excessive tabs that prevent the user for accessing the page effectively. This issue is not detected by WAVE.

CHANGES

- Using javascript to disable scrolling by pressing spacebar and setting action to click instead for the checkbox
- Setting tabindex where necessary and getting rid of redundant ones to allow easier interactions on keyboard



Information Conveyed Only via Color

The links we have, despite having a different color, have no other ways for the users to distinguish from normal text. This is not as severe of an issue and is not detected by WAVE. However, it would be really helpful to tell where the links are if the user is particularly looking for them.

CHANGES

- Changing the styles of links to be underscored
- Changing the green navigation tab images to straightforward text with borders

MISC Improvements and Finishing Touches

- Getting rid of the main content text that has no particular purpose and is off-screen
- Setting HTML language to "en"
- Correcting broken link to home page
- Fixing broken sign-up button link due the following change: "name" becomes "fn", "mi" and "ln", so the input field "name" does not exist anymore
- Fixing the style of the form to make it more aesthetically pleasing
- Changing the wording of "links" to "resources" to provide more meaningful information
- Changing form labels from HTML "label" tag to "aria-labelledby"
- Changing the default submit button to be more visible and easier to tell whether it's focused
- Aligning text to center in CSS

Final Result

There are 5 main improvements:

1. All the useful elements of the page are **accessible through tab**, and clickable through either enter or space bar
2. The **focus** is specifically designed to be intuitive, clear and obvious to the user
3. The **structure/outline** of the page is clear and logical, and the positioning /organizing of elements is simple
4. **Alternative text**, subtitles and video description provides a lot of accessibility to the page
5. **Aria tags and labels** helped to indicate the state of elements and assist user interactions with the page

Summary

WAVE has detected the following:

- 0 Errors
- 0 Alerts
- 7 Features
- 8 Structural Elements
- 24 HTML5 and ARIA
- 0 Contrast Errors

Details

No contrast issues were detected.

Does not account for background images, gradients, etc. Ensure fall-back contrast is defined in case images or CSS3 do not display.

Outline

- h1** Accessibility Overview
- h2** Resources
- h2** Sign Up!
- h3** Name
- h3** Email
- h3** Subscription
- h3** Comments

The screenshot shows the WAVE web accessibility evaluation tool interface. At the top, there's a logo and the text "WAVE web accessibility evaluation tool". Below this are three tabs: "Styles", "No Styles", and "Contrast". The "Details" section is active, showing a filter set to "Full". The results are categorized into four main groups, each with a checkmark icon and a count in parentheses:

- Features (7)**:
 - 5 X Alternative text (represented by 5 green "alt" icons)
 - 2 X Linked image with alternative text (represented by 2 green "alt" icons)
- Structural Elements (8)**:
 - 1 X Heading level 1 (represented by 1 "h1" icon)
 - 2 X Heading level 2 (represented by 2 "h2" icons)
 - 4 X Heading level 3 (represented by 4 "h3" icons)
 - 1 X Unordered list (represented by 1 list icon)
- HTML5 and ARIA (24)**:
 - 1 X Header (represented by 1 header icon)
 - 1 X Navigation (represented by 1 navigation icon)
 - 4 X Main content (represented by 4 main content icons)
 - 1 X Aside (represented by 1 aside icon)
 - 1 X HTML5 video or audio (represented by 1 video/audio icon)
 - 3 X ARIA (represented by 3 ARIA icons)
 - 5 X ARIA label or description (represented by 5 ARIA label/description icons)
 - 8 X ARIA tabindex (represented by 8 ARIA tabindex icons)