UiPath and Deque Axe for 508 testing

Welcome!

Introduction:

Many web applications are required to conform to the Revised Section 508 Standards published by the U.S. Access Board in support of Section 508 of the Rehabilitation Act of 1973:

> In 1998, Congress amended the Rehabilitation Act of 1973 to require Federal agencies to make their electronic and information technology (EIT) accessible to people with disabilities. The law (29 U.S.C § 794 (d)) applies to all Federal agencies when they develop, procure, maintain, or use electronic and information technology. Under Section 508, agencies must give disabled employees and members of the public access to information comparable to the access available to others.
>
> The U.S. Access Board is responsible for developing Information and Communication Technology (ICT) accessibility standards to incorporate into regulations that govern Federal procurement practices. On January 18, 2017, the Access Board issued a final rule that updated accessibility requirements covered by Section 508, and refreshed guidelines for telecommunications equipment subject to Section 255 of the Communications Act. The final rule went into effect on January 18, 2018.
>
> Source: https://section508.gov/manage/laws-and-policies

There are several tools that help in conducting 508 compliance testing. I chose Deque for its unique benefits and ease of use

Deque offers open-source and licensed tools to help with automated accessibility testing. One of their offerings is the axe Dev Tools: https://www.deque.com/axe/devtools/

The Axe Dev Tools is available in 3 flavors

1) A Browser Plugin like this one for Chrome https://chrome.google.com/webstore/detail/axe-devtools-web-accessib/lhdoppojpmngadmnindnejefpokejbdd?hl=en-US

2) Axe Command Line Interface or Axe CLI https://github.com/dequelabs/axe-core-npm/tree/develop/packages/cli

3) Axe Core API https://www.deque.com/axe/core-documentation/api-documentation/

Contact Mahesh Yelisetti: ymahesh@gmail.com for any questions

Each of the above flavors have their own advantages and disadvantages

Advantage or Disadvantage/Tool Flavor	Advantages	Disadvantage
Browser Plugin	Simple To use Very good interface to help clarify issues found and fix them Excellent support on deque university for details on fixing issues Very useful highlight tool to pin point issues	Manual user interface Works only on a per page basis Does not crawl through application Does not scan all child pages Output report is not exportable
Axe CLI	Provides simple and well organized report on findings Can be invoked from command line and hence integrated with other applications that can execute command line scripts Output report is exportable in text format	Works only on a per page basis Does not crawl through application Does not scan all child pages Output report is not exportable
Axe Core API	Provides a wide variety of capabilities Can be invoked from any other testing tool frameworks like Selenium Output report is exportable in text, html format	Works only on a per page basis Does not crawl through application Does not scan all child pages Output report is not exportable

Hybrid Axe CLI plus UiPath	Provides a way to scan multiple pages as long as the URL is unique Since UiPath can be used for functional testing of the web application, it can be clubbed with Axe CLI for expanded coverage	Does not crawl through application Does not scan all child pages
Hybrid Browser Plugin plus UiPath	Provides a way to scan any page even if the URL is not unique Since UiPath can be used for functional testing of the web application, it can be clubbed with Axe CLI for expanded coverage Can be used for infinite amount of scans When used with UiPath it can give the equivalent effect of scanning multiple pages (as long as UiPath drives user to the page) Output report is exportable as an image of the scan results	Cant think of any!!

Conclusion

Going by the above comparison, specifically for the solution that uses UiPath and Axe DevTools plugin, this UiPath library activity "PerformVisual508Scan" helps in the following way:

Assuming that a web application of interest is open in google chrome browser and that is the only web browser open at that instance, and assuming the web page that is open needs to be scanned, using the simple library activity call "PerformVisual508Scan" and passing it just where the results need to be stored will do the following:

1) Invoke Chrome Developer Tools using the "Ctrl+Shift+I" shortcut
2) Access axe DevTools from the left most corner when the Developer Tools is parked to the bottom of page
3) Strat a new scan
4) Take screenshot of the page after the scan is completed showing both the page context and the scan results
5) Store the scan results (screenshot in the desired location passed to the activity " Example: c:\automation or any other folder that already exists on the windows computer running the UiPath Studio software

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UiPath and Axe DevTools for 508 testing.
Go to this site for details: https://github.com/my2239/UiPathAxe508

Ready to use the UIPath + Ace Browser Plugin solution? Just look at steps below

Prerequisites

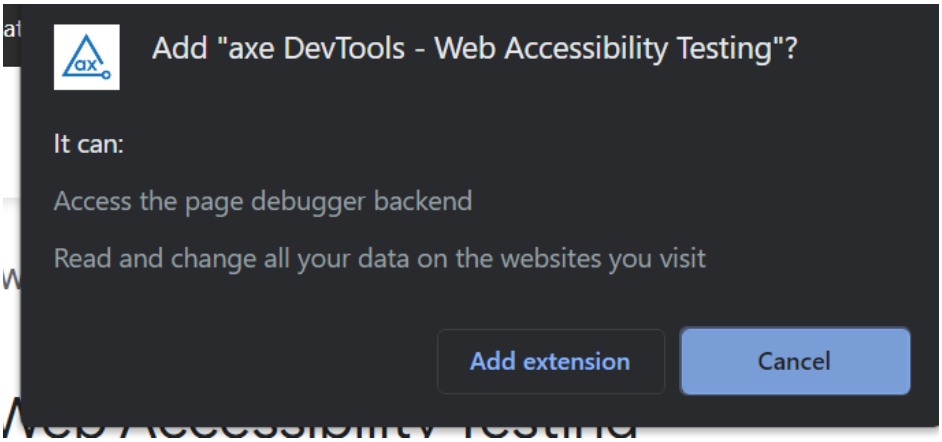
Firstly you can only run these tests on Google Chrome

Assuming you have Google chrome installed, you need to get the Axe Chrome Plugin

https://chrome.google.com/webstore/detail/axe-devtools-web-accessib/lhdoppojpmngadmnindnejefpokejbdd?hl=en-US

Install the plugin by clicking on the Add to Chrome blue button

You may get a prompt to add the extension, if so click on the "Add extension button"



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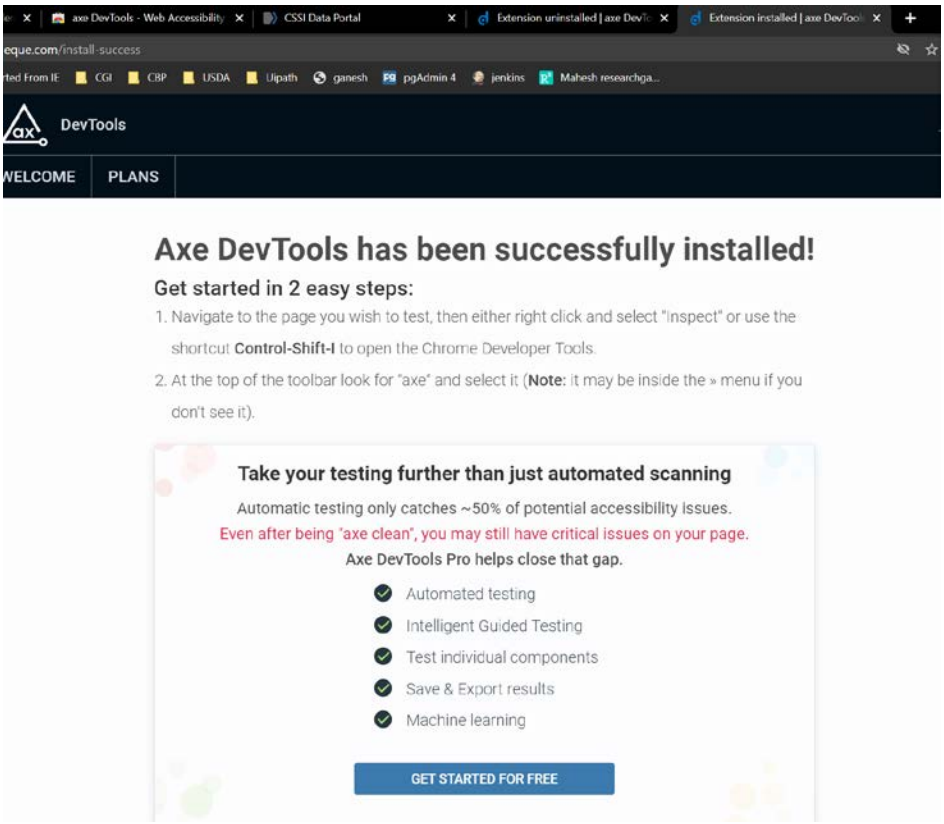
You may see this page now (click on the blue "GET STARTED FOR FREE" button)



If you are taken to this page (Just close the tab, there is no need to sign in)

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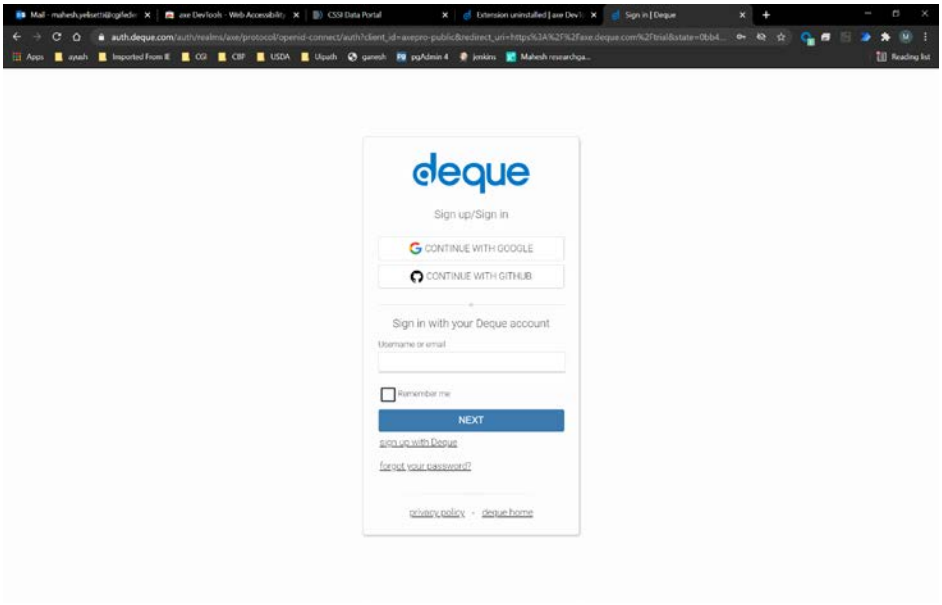

Open any web page you want to scan like https://cssi-dcc.nci.nih.gov (I chose this because I worked on this web site in the past and because it is simple, publicly available)

Click on the following keys on your keyboard all at once (Ctrl+Shift+I) (That is the Ctrl button, the Shift button and I button all together, at once)

In a few seconds the Developer Tools Bar would appear

Chances are this toolbar may appear on the right side of your page (Notice the developer tool bar on the right side of the page.

Depending on your settings the toolbar may have a white background. Mahesh Yelisetti likes black background and hence this screenshot below)

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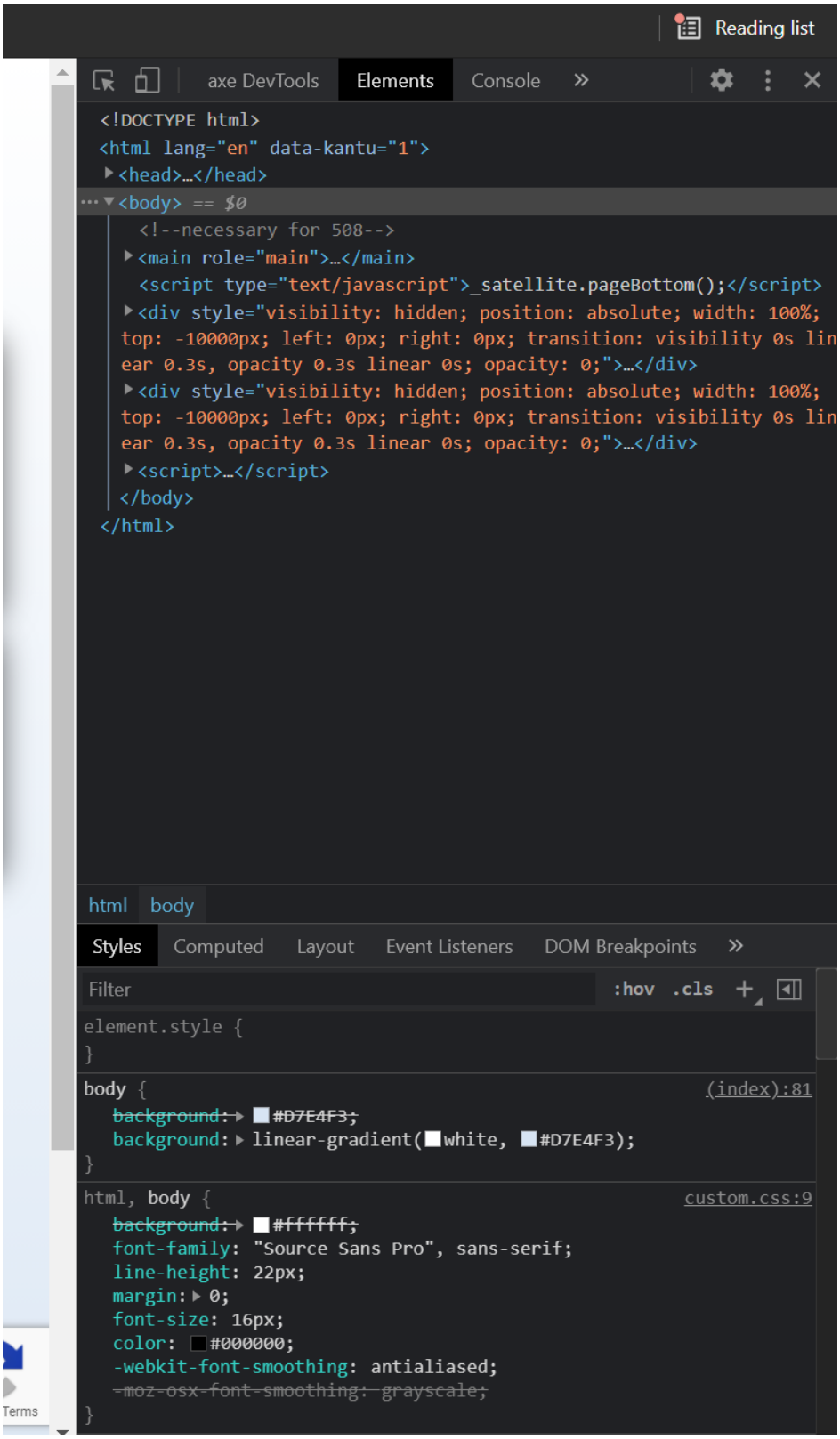

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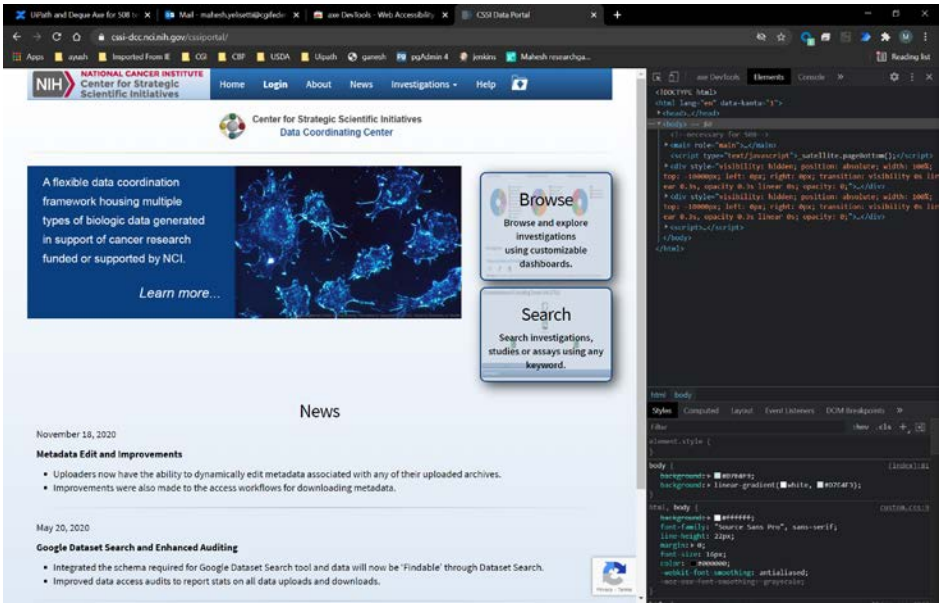
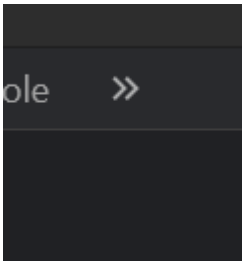
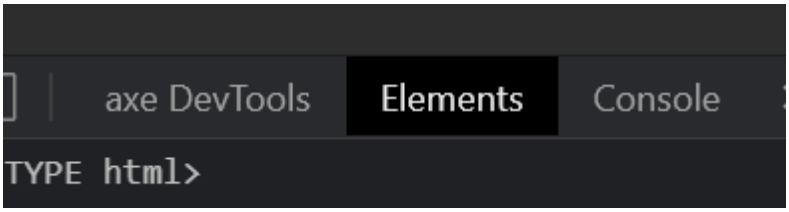


Now we need to click on the >> icon within the toolbar



You will find "axe DevTools" menu option

Click, hold and drag it to the left of the "Elements" menu



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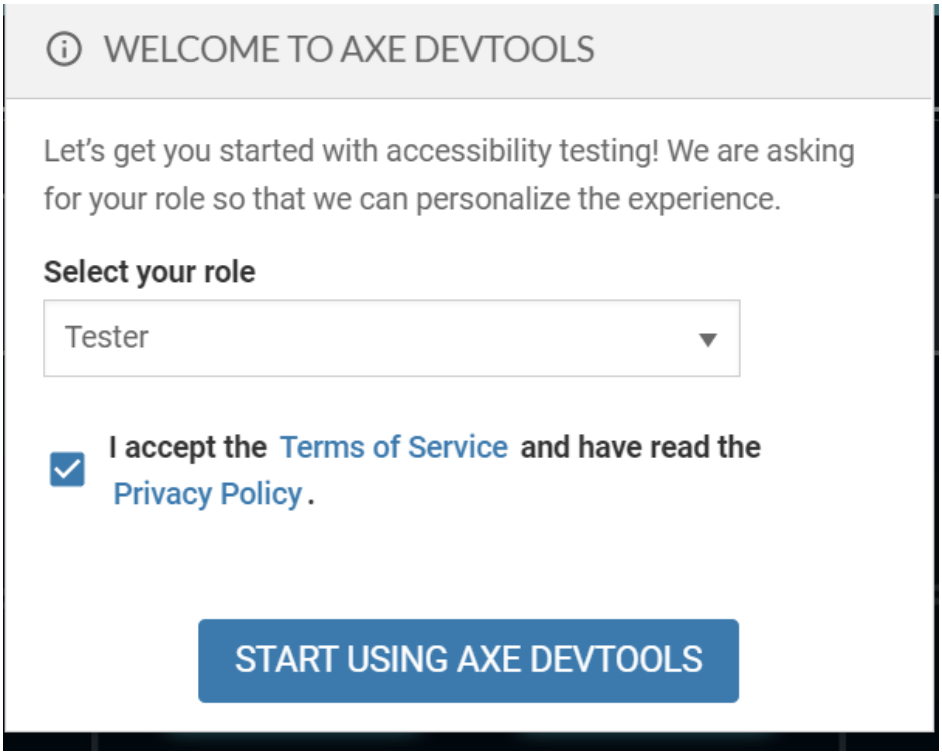
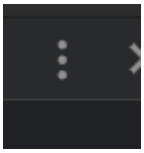
Now click on axe DevTools, you may see the screen below, is so choose a role like Tester and accept the terms, click on "START USING AXE DEVTOOLS" button



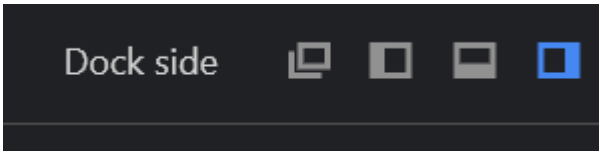
You also need to move the placement of the Dev Tools Bar from right to bottom of the page

To do this, click on the three vertical dot Ellipses icon to the top right corner of the Dev Tool Bar



In the docking toolbar, choose the third option from left

Your toolbar may look like this



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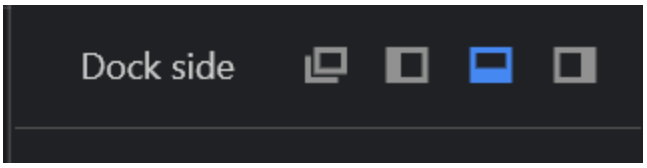
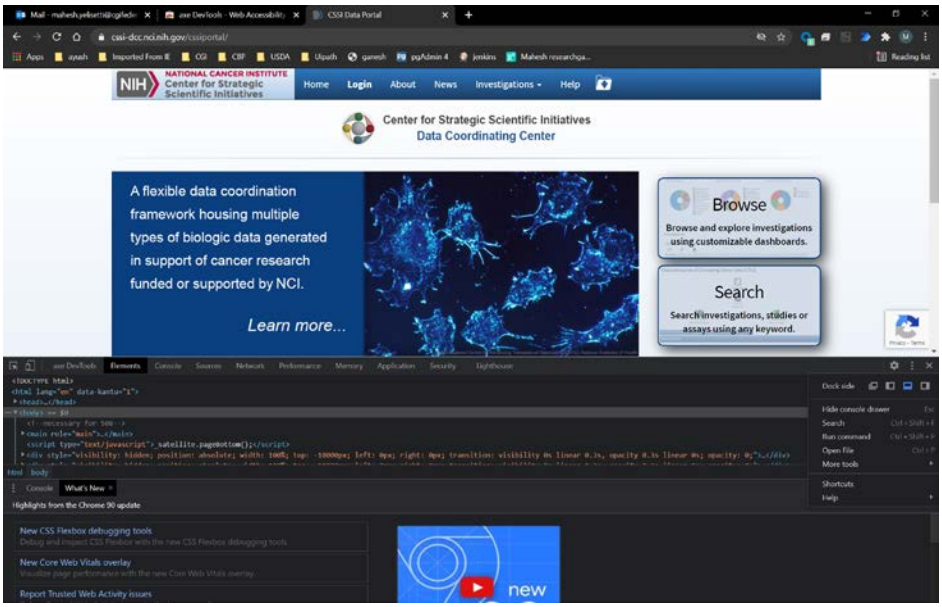
It should look like this



Now you should see your Dev Tools Bar appear in the bottom of the page and of course the axe DevTools will be the first Menu option

Your screen should look like this now



Instructions for using the UiPath Libraries

Firstly both the above Hybrid solutions require that UiPath tool is currently used for functional testing and installed, working

If this is not the case, Please switch to Axe Core API and use it from Selenium or other testing approaches you currently use

Now if your project already uses UiPath, you can borrow two libraries I have created for this purpose and call them anywhere in your test

For Hybrid Axe CLI plus UiPath, please use library Axe508Library.1.0.7.nupkg

For Hybrid Browser Plugin plus UiPath please use
library AxeVisual508ScanLibrary.1.0.12.nupkg

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UiPath and Axe DevTools for 508 testing.
Go to this site for details: https://github.com/my2239/UiPathAxe508

Both these libraries are in a public GitHub Project

If you do not have access to this location, please reach out to the CMS team through your manager

Within UiPath, in any test that is already coded, it is possible to call the PerformVisual508Scan Activity and complete a scan

The results will be in the folder path that is passed to the Library call (the folder obviously should pre exist)

A practical scenario where the Hybrid UiPath plus Axe Plugin was used

Here is a typical test scenario I automated

1. Open Google Chrome Browser
2. Log in to the CSSI DCC application (https://cssi-dcc.nci.nih.gov)
3. Perform a 508 Scan visually using the Axe-DevTools chrome plugin
4. Record a screenshot of 508 results and the page in context
5. Click on the "Search" button (at the center right corner of the page)
6. Perform a second 508 Scan visually using the Axe-DevTools chrome plugin
7. Record a screenshot of 508 results and the page in context

The two screenshots taken in the context of the above test

https://github.com/my2239/UiPathAxe508/blob/main/axe_scan_2021426124614.png

https://github.com/my2239/UiPathAxe508/blob/main/axe_scan_2021426124645.png

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