MICHIGAN STATE UNIVERSITY | Usability/Accessibility Research and Consulting

To: Robert Van Rennes, Big Ten Academic Alliance
From: Grey L. Pierce, MSU Usability/Accessibility Research and Consulting
Subject: Scopus High-Level Accessibility Evaluation for the Library Accessibility Alliance
Date: November 16, 2020

MSU Usability/Accessibility Research and Consulting (MSU UARC) conducted a high-level accessibility evaluation of the Scopus platform to evaluate its conformance with WCAG 2.1 AA Criteria. This evaluation did not include all functionality or content of the site or all WCAG 2.1 AA Success Criteria.

During this evaluation, a number of issues were found that will make the site difficult or impossible to use for many individuals with disabilities.

Keyboard users, including screen reader users and users with dexterity impairments, will find it difficult or impossible to access or use some content. Some content cannot be reached or operated via keyboard, making it impossible to use for those that rely on keyboard access. Most interactive elements lack a sufficiently visible focus indicator, making it difficult for many keyboard-only users to effectively use them, as they cannot determine when they have reached the correct element.

Individuals who rely on screen readers, including many users with visual, reading, and language impairments, will have problems using the site. Some content is not read correctly, and structural information (including headings and lists) is not appropriately conveyed to users, making it difficult or impossible to understand content and organization in places. Some form inputs are not appropriately labeled, making those inputs difficult or impossible to use for those that rely on screen readers. Custom elements do not correctly announce themselves to screen readers, making them difficult to understand and use. Some images have inappropriate alternative text, significantly impacting users with visual impairments.

The PDF has not been tagged for accessibility and no structural information is provided to assistive technologies, making it extremely difficult to use and navigate for users with disabilities. Additionally, no title is provided to assistive technologies.

Other issues were found that will make it difficult for users with a variety of disabilities to effectively use the system, including insufficient color contrast for text and meaningful visual elements, use of color alone to distinguish content, images of text being used instead of styled text, insufficient link context, content unexpectedly changing when keyboard focus shifts, text not reflowing when the viewport or text size is changed, and inappropriate page titles.

To improve access for users with disabilities, MSU UARC recommends a full WCAG 2.1 AA evaluation and that the problems discovered be remediated.

Note: Results for "biped robots" were used as an example of a Search Results page and "Fractal mechanism of basin of attraction in passive dynamic walking" was used as an example of a Document Details and an IOP Article page and PDF.

For reference, screenshots of the Home page (wide, medium, and narrow viewport widths) at the time this evaluation was completed have been included at the end of this memo.

High-Level Findings

Document Structure

- Headings are not appropriately structured. [WCAG 2.1 SC 1.3.1]
  - On all Scopus pages, "About Scopus", "Language", and "Customer Service" should be h2s, not h3s
  - On the Home page, "Compare sources" should not be tagged as a heading
  - On the Search Results page, search terms (e.g., "TITLE-ABS-KEY (biped AND robots) AND...") should not be tagged as a heading
  - On the Document Details page, "(Article)" and "(Open Access)" should not be tagged as headings
  - On the Document Details page, "View references (37)" should not be tagged as a heading
  - On the Document Details page, "References (37)" should be tagged as an h3, not an h4
  - On the Document Details page, "PlumX Metrics" should be tagged as an h4, not an h3
  - On the IOP Article page, "Author e-mails", "Author affiliations", "Author notes", "ORCID iDs", "Dates", etc. should be tagged as headings
- Lists are not appropriately structured. [WCAG 2.1 SC 1.3.1]
  - On the Home page, "Compare Sources" shouldn't be coded into a one-item list
  - On the Home page, "Search tips" shouldn't be coded into the list with "Documents", "Authors", etc.
  - On the Search Results page, "View Mendeley Data (29)" shouldn't be coded into a one-item list
  - On the Search Results page, "Analyze search results" and "Show all abstracts" shouldn't be coded into lists
  - On the Search Results page, topics ("Biped Robot", "Gait", and "Inverted Pendulum") should be coded into a programmatic list
  - On the Search Results page, lists under "Author keywords" and "Indexed keywords" should be coded into programmatic lists
  - On the Search Results page, "Export", "Print", "E-mail", etc. should be coded as separate list items
  - On the Document Details page, "References (37)" and "View in search results format" shouldn't be coded into lists
  - On the Document Details page, "More..." shouldn't be coded into a one-item list
  - On the IOP Article page, lists under "Author affiliations", "Peer review information", etc. should be coded into programmatic lists
- On the Search Results page, there is no programmatically determinable relationship between document titles and "View abstract", "View at Publisher", etc. [WCAG 2.1 SC 1.3.1]
- On the Search Results page, the text of author name links is not read out by screen readers (only the associated superscript definitions are read). [WCAG 2.1 SC 1.3.1, WCAG 2.1 SC 1.3.2, WCAG 2.1 SC 2.4.4]

- PDF is untagged, and provides no structural information or reading order information to assistive technologies. [WCAG 2.1 SC 1.3.1, WCAG 2.1 SC 1.3.2]
- On the Document Details page, "Citations in Scopus" and "Field-Weighted Citation Impact" should be read out before the content they organize (e.g., "2", "3.10"). [WCAG 2.1 SC 1.3.2]

Keyboard Support

- Some interactive content cannot be reached via keyboard. [WCAG 2.1 SC 2.1.1]
  - On the Home page, "Documents", "Authors", and "Affiliations" are visually presented as radio buttons, but cannot be interacted with as radio buttons (i.e., via arrow keys)
  - On the IOP Article page, cannot open the Altmetric lightbox
  - On the IOP Article page, cannot activate "Zoom In", "Zoom Out", or "Reset image size" buttons for Figures
  - On the IOP Article page, cannot reach document section expanders (e.g., "1. Introduction") [narrow viewport]
- Focus is not sufficiently visible for most interactive content. [WCAG 2.1 SC 2.4.7]
  - On all Scopus pages, all interactive elements (with the exception of the "Sign in" button, the "Search" button on the Home page, the search button on the Search Results page, dropdown buttons, and text inputs)
  - On all Scopus pages, the focus indicator for radio buttons is identical to the radio button selected indicator
  - On the IOP Article page, header links, "Article PDF" button, buttons under "Share this article", and the "BibTeX", "RIS", "Standard image", and "High-resolution image" buttons
- On the IOP Article page, the Dimensions lightbox appears when it receives focus, without the user taking an explicit action or being warned. [WCAG 2.1 SC 3.2.1]

Navigation

- The Document Details page title does not include the document name. [WCAG 2.1 SC 2.4.2]
- PDF title is not available to screen readers (Document Properties not set to show Document Title in Initial View). [WCAG 2.1 SC 2.4.2]
- On the Search Results page, the text of author name links is not read out by screen readers (only the associated superscript definitions are read). [WCAG 2.1 SC 2.4.4 , WCAG 2.1 SC 1.3.1, WCAG 2.1 SC 1.3.2]

Forms and Data Submission

- On the Home page, "Date Range" dropdowns are not programmatically associated with radio button and grouping label text. [WCAG 2.1 SC 3.3.2]
- On the Home page, "Published" dropdown labels do not differentiate between start and end date inputs. [WCAG 2.1 SC 3.3.2]
- On the Search Results page, checkbox labels do not include document titles. [WCAG 2.1 SC 3.3.2]

Images

- A variety of images have inappropriate or missing alternative text. [WCAG 2.1 SC 1.1.1]

- External link icon (e.g., after "SciVal") on all Scopus pages
- CC-BY (Creative Commons) image on the IOP Article page
- Figures in the article on the IOP Article page
- Advertisement images on the IOP Article page
  - Images in the PDF lack alternative text. [WCAG 2.1 SC 1.1.1]
  - "Check for updates" on the IOP Article page is an image of text, instead of styled text. [WCAG 2.1 SC 1.4.5]

Color and Visual Characteristics

- On all Scopus pages, color is the only means to differentiate focused elements (e.g., orange vs. white for link underlining, dark grey vs. blue for link text, orange vs. grey for navigation icons, orange vs. blue for "Create account"). [WCAG 2.1 SC 1.4.1]
- On all Scopus pages, color is the only means to differentiate checkbox status (orange vs. white). [WCAG 2.1 SC 1.4.1]
- On the Search Results page, color is the only means to differentiate search term highlighting (yellow vs. white). [WCAG 2.1 SC 1.4.1]
- On the IOP Article page, color is the only means to differentiate focus on header links (red vs. blue) and focus on "BibTeX", "RIS", "Standard image", and "High-resolution image" buttons (red vs. grey). [WCAG 2.1 SC 1.4.1]
- Light blue on light grey background (e.g., "All", "Export", "Download", on Search Results page; "Export", "Print", "Email", and "see details" in PlumX Metrics section on Document Details page), light grey text on white (e.g., search detail text ["TITLE-ABS-KEY", "AND", etc.] on Search Results page), grey text on light grey (e.g., PlumX Metrics section ["Citations", "Citation Indexes:", "Captures", etc.] on Document Details page), and light green text on white (ORCiD icon on IOP Article page) have insufficient contrast. [WCAG 2.1 SC 1.4.3]
- On the IOP Article page and in the PDF, a variety of text in Figures has insufficient contrast (e.g., blue, orange, green, and red text on white background in Figure 1). [WCAG 2.1 SC 1.4.3]
- In the PDF, light blue text on white background (e.g., links throughout document) has insufficient contrast. [WCAG 2.1 SC 1.4.3]
- Light grey symbols on white (e.g., external link icon and radio buttons for "Documents", "Authors", and "Affiliations on the Home page) have insufficient contrast. [WCAG 2.1 SC 1.4.11]

Custom Elements and Dynamic Content

- Scopus pages do not reflow when the viewport is decreased in size or text is enlarged, requiring users to scroll in two directions to read content. [WCAG 2.1 SC 1.4.10]
- On the Home page, "Documents", "Authors", and "Affiliations" are visually presented as radio buttons, but are incorrectly declared as links. [WCAG 2.1 SC 4.1.2]
- On the Home page, no feedback is provided to screen readers when search rows are deleted. [WCAG 2.1 SC 4.1.2]
- On the Home page, "1 of 1" is incorrectly read out after all items in dropdowns. [WCAG 2.1 SC 4.1.2]
- On the Search Results page, role and value (i.e., that it expands and whether it is expanded or collapsed) are not provided for "View abstract"/"Hide abstract", and

screen readers are not notified when the link is activated and content changes. [WCAG 2.1 SC 4.1.2]

- On the IOP Article page, role and value (i.e., that they expand and whether they are expanded or collapsed) are not provided for document section expanders (e.g., "1. Introduction") [narrow viewport]. [WCAG 2.1 SC 4.1.2]

Disclaimer: This high-level evaluation was conducted for the Library Accessibility Alliance, and represents a good faith effort conducted within a limited time frame. It should not be assumed to be complete or free from error. No warranties or guarantees are implied. UARC is not responsible for direct, indirect, or incidental damages based on this work; its use or interpretation by any individual, group, or organization; or on conditions beyond our control.

Home Page Screenshots

Large Viewport

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Scopus

Document search

Compare sources >

○ Documents   ○ Authors   ○ Affiliations   Advanced

Search tips ⑦

Search

Article title, Abstract, Keywords

E.g., "Cognitive architectures" AND robots

> Limit

Reset form   Search ⌕

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Document search

◉ Documents   ◯ Authors   ◯ Affiliations   Advanced

Search   Article title, Abstract, Keywords   ⌄

E.g., "Cognitive architectures" AND robots

> Limit

Reset form   Search 🔍

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