Making LaTeX-generated PDFs Screen Reader Friendly (and otherwise accessible)

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December 4, 2025

Outline

Giant Disclaimer

- I am not claiming that this will be ‘perfect’ accessibility.
- More so this is the bare minimum to be compliant with university policy
- if you find yourself with a visually impaired student in your class,you will want to create documents targeted specifically for their needs and their assistance software–talk to Alex.

How Do Screen Readers Work?

Screen readers typically do not look at the image of the page. They read the documents embedded structure (the tagging!).

If tags are missing or malformed, the reader guesses(often incorrectly).

Math poses additional challenges: PDF has no native math structure.

Accessible PDFs from LaTeX are inherently weird

Historically LaTeX took the author's structure information (chapter, section, etc) and used that to influence style, but ultimately threw away this information, because the underlying TeX engine was only interested in glueing boxes together. Producing an accessible PDF requires adding a hidden structure tree to the output. This tree must match the visible content. But the latest versions of LaTeX are now preserving the structure information and creating the needed structure tree.

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In other words...USE THE NATURAL STRUCTURE TAGGING!!

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Avoid:

- Decorative spacing tricks. (use \ vspace with caution)
- TikZ/graphics without captions or alt text. (ALWAYS use `\begin{figure}` with an alt text line) [more on this in a moment]

The cleaner the markup, the more accurate the tagging.

Enabling Tagging and Alt Text for Screen Readers

Use the following header:

```
\DocumentMetadata{ pdfstandard=ua-2, pdfstandard=a-4f, tagging=on, tagging-setup={math/setup=mathml-SE} }
\documentclass[12pt]{article}
\usepackage{ifluatex}\ifluatex\usepackage{unicode-math,fontspec}
\else\usepackage[utf8]{inputenc}\usepackage[T1]{fontenc}\fi
```

Enabling Tagging

Then compile with LuaLaTeX:

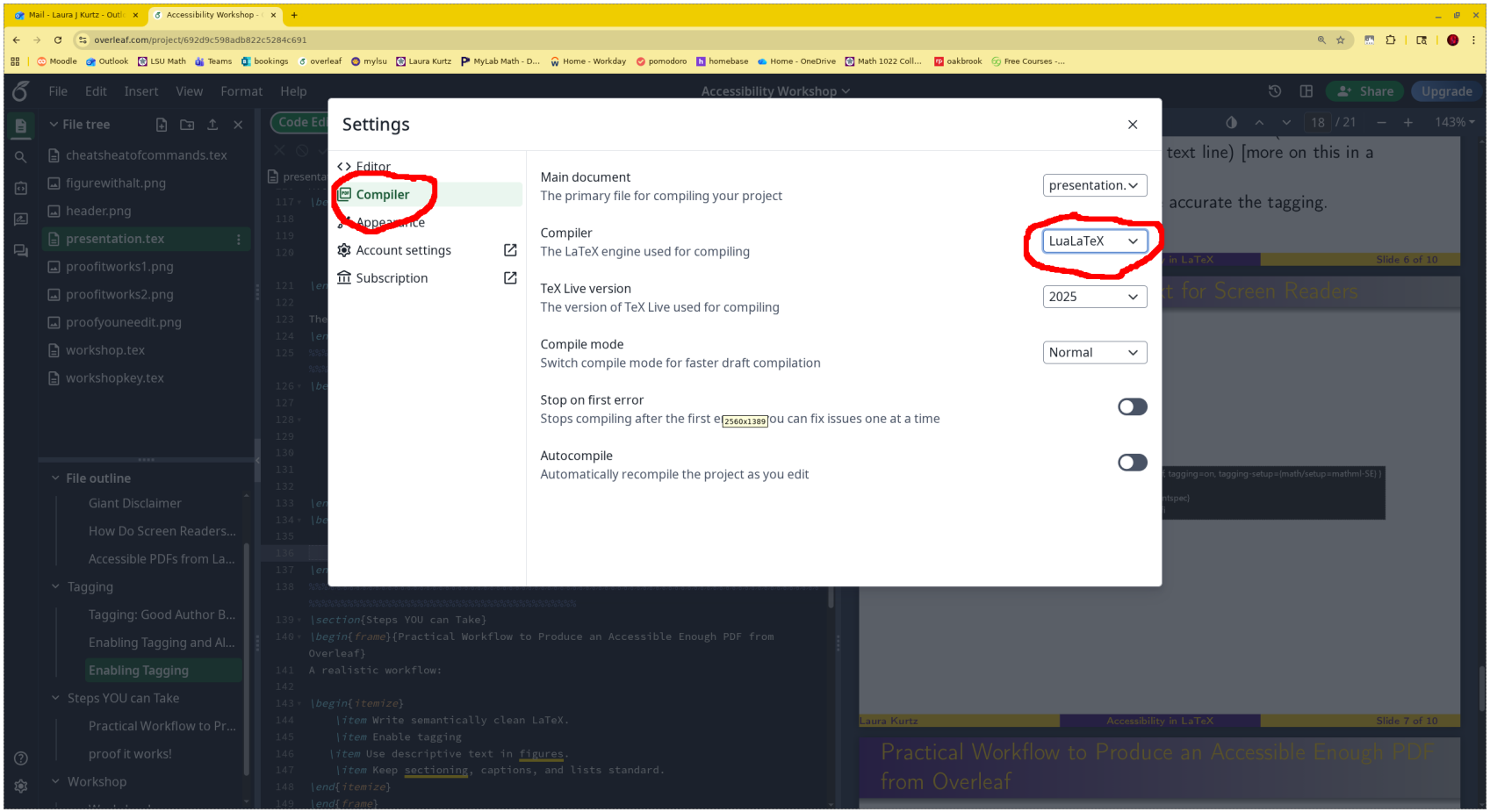


Figure 1: instructions for enabling luaLaTeX in overleaf

how to get alt text for images

This is included in modern versions of graphicx.

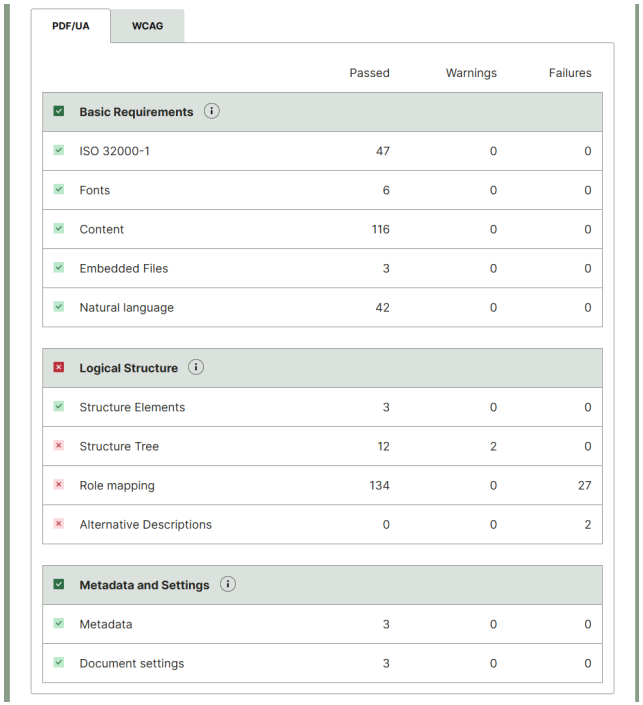
```
\begin{figure}[h!]
    \centering
    \includegraphics[width=0.3\textwidth,alt={Here is a description of the image as required.}]{example-
    image},
    \caption{Here is a picture of something.}
    \label{fig:placeholder}
\end{figure}
```

Practical Workflow to Produce an Accessible Enough PDF from Overleaf

A realistic workflow:

- Write semantically clean LaTeX.
- Enable tagging
- Use descriptive text in figures.
- Keep sectioning, captions, and lists standard.

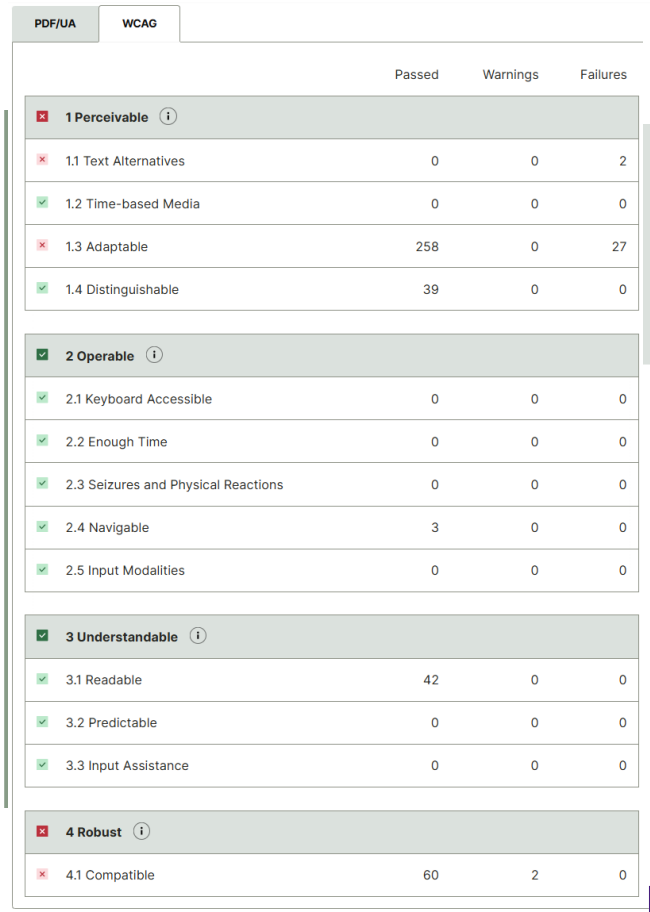
proof it works!



PDF/UA | WCAG

	Passed	Warnings	Failures
Basic Requirements			
ISO 32000-1	47	0	0
Fonts	6	0	0
Content	116	0	0
Embedded Files	3	0	0
Natural language	42	0	0
Logical Structure			
Structure Elements	3	0	0
Structure Tree	12	2	0
Role mapping	134	0	27
Alternative Descriptions	0	0	2
Metadata and Settings			
Metadata	3	0	0
Document settings	3	0	0

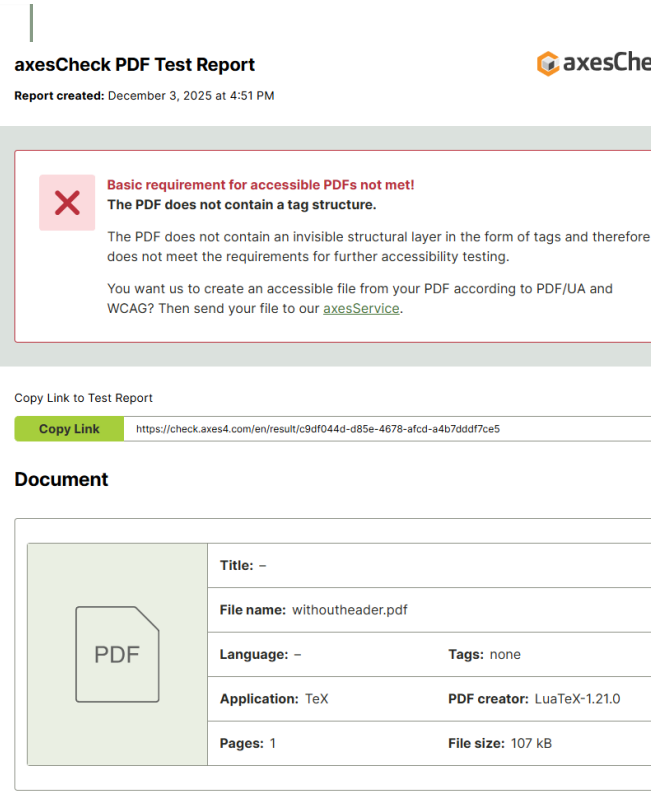
Figure 2: Score



PDF/UA | WCAG

	Passed	Warnings	Failures
1 Perceivable			
1.1 Text Alternatives	0	0	2
1.2 Time-based Media	0	0	0
1.3 Adaptable	258	0	27
1.4 Distinguishable	39	0	0
2 Operable			
2.1 Keyboard Accessible	0	0	0
2.2 Enough Time	0	0	0
2.3 Seizures and Physical Reactions	0	0	0
2.4 Navigable	3	0	0
2.5 Input Modalities	0	0	0
3 Understandable			
3.1 Readable	42	0	0
3.2 Predictable	0	0	0
3.3 Input Assistance	0	0	0
4 Robust			
4.1 Compatible	60	2	0

Figure 3: score



axesCheck PDF Test Report

Report created: December 3, 2025 at 4:51 PM

Basic requirement for accessible PDFs not met!
The PDF does not contain a tag structure.

The PDF does not contain an invisible structural layer in the form of tags and therefore does not meet the requirements for further accessibility testing.

You want us to create an accessible file from your PDF according to PDF/UA and WCAG? Then send your file to our axesService.

Copy Link to Test Report

Copy Link https://check.axes4.com/en/result/c9df044d-d85e-4678-afcd-a4b7dddf7ce5

Document

PDF

Title: –
File name: withoutheader.pdf
Language: – **Tags:** none
Application: TeX **PDF creator:** LuaTeX-1.21.0
Pages: 1 **File size:** 107 kB

Figure 4: won't even let me get a score

proof it works-adobe accessibility score

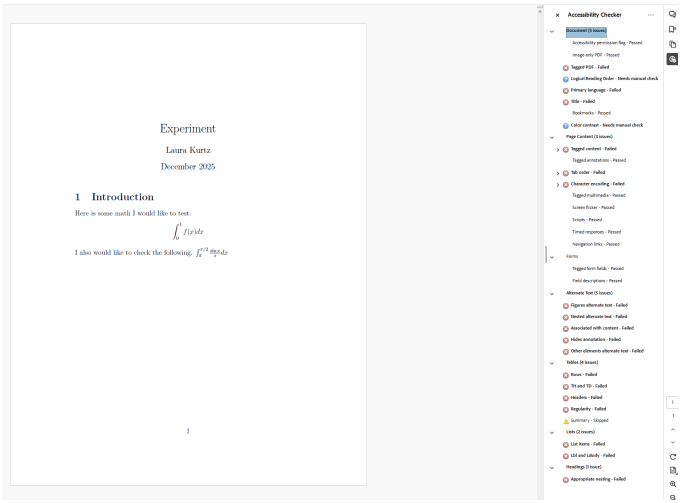


Figure 5: without metadata

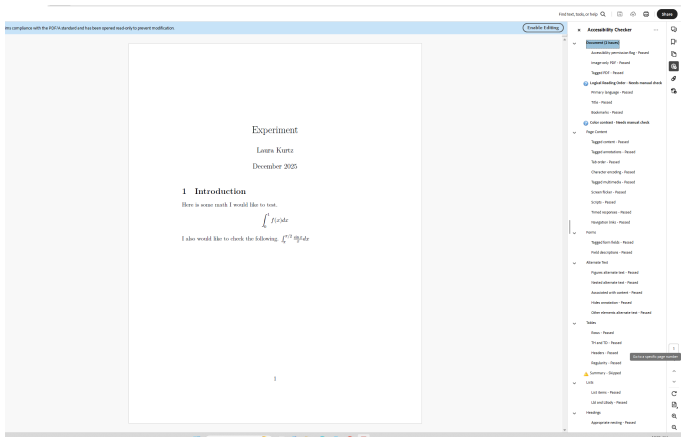


Figure 6: with metadata

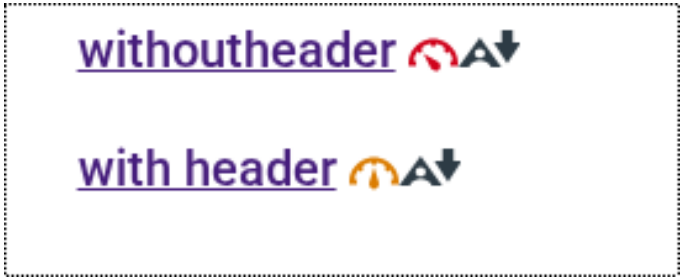


Figure 7: without metadata

Figure 8: with metadata

Workshop!

Try to make the PDF Ive provided more screen-reader friendly. Suggested improvements:

- Add headings, captions, lists. Enable tagging
- Use descriptive text.
- Clean up layout to match logical reading order.