



Embedded Ethics:

CSC207
Mini-lecture 3:
Designing for
Accessibility



You can get help in designing accessibly!

Companies often hire consultants and/or beta testers.

An excellent way to learn about someone's experience of using your software is to ask them. This is especially true if they have a disability that you have not experienced.

- Example of a consulting company that specializes in testing, including for accessibility purposes: <https://www.ibeta.com/accessibility-testing/>
- Other independent testers (e.g. SightlessKombat on Youtube)



Accessibility checkers are automated systems that perform tests to check whether programs or files are accessible.

Many major app stores have mandatory in-house accessibility checkers.

Powerpoint has an accessibility checker.



Accessibility for Ontarians with Disabilities Act (AODA)

Most public and private organizations in Ontario are expected to make their websites compliant with Web Content Accessibility Guidelines 2.0 to the “AA” level (which includes the lower “A” level, too)

<https://www.ontario.ca/page/how-make-websites-accessible>

Corporations can be fined up to \$100,000 a day for non-compliance.

Individuals can be fined up to \$50,000 a day for non-compliance.

1.4.1 Use of Color — Level A

Color is not used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.

Understanding 1.4.1

Note 1: This success criterion addresses color perception specifically. Other forms of perception are covered in Guideline 1.3 including programmatic access to color and other visual presentation coding.

➤ Show techniques and failures for 1.4.1

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2.3.1 Three Flashes or Below Threshold — Level A

Web pages do not contain anything that flashes more than three times in any one second period, or the flash is below the general flash and red flash thresholds.

Understanding 2.3.1

Note 1: Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether it is used to meet other success criteria or not) must meet this success criterion. See Conformance Requirement 5: Non-Interference.

➤ Show techniques and failures for 2.3.1

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1.4.2 Audio Control — Level A

If any audio on a Web page plays automatically for more than 3 seconds, either a mechanism is available to pause or stop the audio, or a mechanism is available to control audio volume independently from the overall system volume level.

Understanding 1.4.2

Note 1: Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether or not it is used to meet other success criteria) must meet this success criterion. See Conformance Requirement 5: Non-Interference.

➤ Show techniques and failures for 1.4.2

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Some of Our
Legal Responsibilities
[https://www.ontario.ca/page/how
-make-websites-accessible](https://www.ontario.ca/page/how-make-websites-accessible)

These guidelines are based on
<https://www.w3.org/WAI/standards-guidelines/wcag/>

Summary

It is important to design for a diverse range of users, including users with disabilities.

The concepts we use to think about disability matter.

According to the **medical model** of disability, a physical or mental impairment causes a personal or social limitation.

According to the **social model** of disability, the human world causes a personal or social limitation.

Depending on which model we have in mind, we may design software in different ways.

Other Resources

<p>If you want to learn more about accessibility and the human aspects of software design, see:</p>	<ul style="list-style-type: none">• A wealth of companies, links on later slides!• CSC318 (The Design of Interactive Computational Media)• CSC428 (Human-Computer Interaction)
<p>If you want to learn more about the ethics of software design, consider taking:</p>	<ul style="list-style-type: none">• CSC300 (Computers and Society)• Various HPS courses• PHL277 (Ethics of Big Data)
<p>If you liked the more abstract philosophy, understanding and debating about concepts like <i>relational equality</i> and <i>causes vs. background conditions</i>, consider taking:</p>	<ul style="list-style-type: none">• PHL233 (Philosophy for Scientists) – includes causation• PHL265 (Introduction to Political Philosophy) – about equality and justice• PHL275 (Introduction to Ethics) – about the nature and theories of ethical right and wrong

Acknowledgements

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References

- Wasserman, David, Adrienne Asch, Jeffrey Blustein, and Daniel Putnam, "Disability: Definitions, Models, Experience", *The Stanford Encyclopedia of Philosophy* (Summer 2016 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/sum2016/entries/disability/>

Some Companies in the Accessibility Space

- Index BrailleApp -- <https://www.indexbraille.com/>
- Simple Smartphone -- <http://simplesmartphone.com>
- Ghotit -- <https://www.ghotit.com/>
- Jouse3 -- <https://www.enablingtech.ca/products/jouse-3>
- MathTalk -- <https://mathtalk.com/>
- Zoom -- <https://zoom.us>
- Biometrics -- Linux, Mac, Window
 - <https://itsfoss.com/fingerprint-login-ubuntu/>
 - <https://support.apple.com/en-ca/guide/mac-help/mchl16fbf90a/mac>
 - <https://www.computerworld.com/article/3244347/what-is-windows-hello-microsofts-biometrics-security-system-explained.html>
- IntelliJ -- <https://www.jetbrains.com/idea/>

Designing for Accessibility

- World Wide Web Consortium on Accessibility in Web Design
- Google accessibility pages for Android and web design
- General Google Accessibility Guidelines
- Apple Accessibility Guidelines