Prelude to the next two lectures:

- *"The power of the Web is in its universality."*
  - Tim Berners-Lee, inventor of the World Wide Web.
- In the last lecture, we spoke about how the accessibility to the Internet is biased towards certain populations.
- In the next two lectures, we will deal with what we can do to address two important biases:
  - The bias against people with physical disabilities
  - The bias for Western and English-speaking communities

Prelude (cont'd)

- The other biases (eg. to low-income, rural, low-education communities, etc) we will not deal with in the lectures.
  - In most cases, the main issue in these cases are access to:
    - specialized software/hardware
    - constant upgrades to software/hardware
    - bandwidth (speed of access)
  - You will look at some of these issues in your week 9 lab exercises.

Prelude (cont'd)

- Why consider universal accessibility?
  - It should be the basic right of every human being to have the same opportunities for access.
- How much can we really do in this issue, taking into account all the responsibilities we already have in our lives?
  - The lectures to follow is to brief you with some of the technical aspects to achieving universal accessibilty.
  - You decide whether they are within you power, or if you are inclined to do it.

Is the Internet a Barrier or Door?

- The Internet can be a barrier if this are implemented without consideration to accessibility issues.
- But a more positive view would be to consider that if implemented right, the Internet can also be a door to opportunities previously unavailable to many people.

B211 Internet Computing

Internet Access for People with Physical Disabilities

Lecture Outline

- Physical Barriers to Web Access
- The Web Accessibility Initiative (WAI)
- Better Accessibility on the Client Side
- Better Accessibilty on the Server Side

The Physical Barriers

- The barriers to Internet access for people with physical disabilities comes under 3 major common activities when using a computer:
  - Reading information on the screen
  - Entering information using a keyboard and/or mouse
  - Listening to information in the form of sounds, music, speech, etc, through speakers.

Print Disability

- The term “print disability” refers to limitations in the ability to read prints on a screen.
- Different categories of print disability, eg
  - visual impairment (colour blindness) or blindness
  - reading disabilities such as dyslexia
- People with such disabilities may need prints to be presented in different fonts sizes or colour, or translated to speech or braille.

Print Disability (cont'd)

- The above assumes all information is in the form of prints
  - Some information may also be in graphics or animations, which people with visual disabilities may be problems reading.

Mobility Disability

- People with problems with mobility may have problems using a keyboard and/or mouse.
- Eg.
  - Physical disabilities like cerebral palsy or quadraplegia.
  - injuries or traumas.
  - diseases such as arthritis or Parkinson's disease.
- People with mobility disability requires alternative input devices such as special keyboards, trackballs, voice input, etc.

Hearing Disability

- Hearing impairment or deafness.
- Prevents a person from hearing error beeps, music, spoken speech in newscasts, etc.
- They require visual prompts on-screen, or print-based alternatives to the sounds.

The Web Accessibility Initiative (WAI)

- http://www.w3.org/WAI/
- W3C has a set of guidelines for how to enhance accessibility to the web for people with disabilities.
- This initiative was started in 1997
  - in the early days of the web (early 90's), text was the predominant form of information.
    - Input and output translation for text was easy.
  - Many accessibility problems arose with major adoption of graphics and sounds, and simple text translation software and devices were no longer adequate.

Improving Accessibility

- Two common ways we can improve accessibility to people with disabilities:
  - Server side: improving the implementation of web-sites
    - WAI's Web Content Accessibility Guidelines
  - Client side: improving the set-up of user agents (ie. client applications like browsers)

The Web Content Accessibility Guidelines

- WAI produced (and continually updates) a set of guidelines, checklists, and examples of web implementation issues important for making web sites accessible.
  - The set is summarised in the Curriculum for Web Content Accessibility Guidelines 1.0,
  - Downloadable from the unit downloads page, or http://www.w3.org/WAI/wcag-curric/.

The Web Content Accessibility Guidelines 1.0

1. Provide equivalent alternatives to auditory and visual content.
   - Provide content that, when presented to the user, conveys essentially the same function or purpose as auditory or visual content.
2. Don't rely on color alone.
   - Ensure that text and graphics are understandable when viewed without color.
3. Use markup and style sheets and do so properly.
   - Mark up documents with the proper structural elements. Control presentation with style sheets rather than with presentation elements and attributes.

The Web Content Accessibility Guidelines 1.0

4. Clarify natural language usage.
   - Use markup that facilitates pronunciation or interpretation of abbreviated or foreign text.
   - More on non-English text in the next lecture
5. Create tables that transform gracefully.
   - Ensure that tables have necessary markup to be transformed by accessible browsers and other user agents.

The Web Content Accessibility Guidelines 1.0

6. Ensure that pages featuring new technologies transform gracefully.
    - Ensure that pages are accessible even when newer technologies are not supported or are turned off.
    - Eg. Flash animations, Quicktime movies.

7. Ensure user control of time-sensitive content changes.
    - Ensure that moving, blinking, scrolling, or auto-updating objects or pages may be paused or stopped.

The Web Content Accessibility Guidelines 1.0

8. Ensure direct accessibility of embedded user interfaces.
    - Ensure that the user interface follows principles of accessible design: device-independent access to functionality, keyboard operability, self-voicing, etc.
    - Eg user interfaces from scripts and applets.

9. Design for device-independence.
    - Use features that enable activation of page elements via a variety of input devices.

The Web Content Accessibility Guidelines 1.0

10. Use interim solutions.
    - Use interim accessibility solutions so that assistive technologies and older browsers will operate correctly.

11. Use W3C technologies and guidelines.
    - Use W3C technologies (according to specification) and follow accessibility guidelines. Where it is not possible to use a W3C technology, or doing so results in material that does not transform gracefully, provide an alternative version of the content that is accessible.

The Web Content Accessibility Guidelines 1.0

12. Provide context and orientation information.
    - Provide context and orientation information to help users understand complex pages or elements.

13. Provide clear navigation mechanisms.
    - Provide clear and consistent navigation mechanisms - orientation information, navigation bars, a site map, etc. - to increase the likelihood that a person will find what they are looking for at a site.

14. Ensure that documents are clear and simple.

Guidelines for Setting up an Accessible Browser

- Upgrade to latest versions
    - Most (not all) later versions of browsers have better support for accessibility and work better with add-on technologies like braille translators.
    - Set clear default font sizes, foreground and background colours, link colours etc.
    - Enable accessibility features of browsers (ref: Unit Reader 13 pg 945-951)

Add-on Access Technologies for Standard Browsers

- Sometimes just setting the optimal settings for browsers may not be enough.
- There are special software and devices which can be used in conjunction with browsers to improve accessibility:
    - Screen Magnifier software - magnifies sections of the screen for clearer reading
    - Screen Reader software - translate downloaded web pages to audible speech or braille.
    - Alternative keyboards and mice

"Directly Accessible" Browsers

- Some browsers are made specifically for use by people with disabilities.
- Eg. (ref: Unit Reader 13 pg 953-954)
    - Talking Browsers
    - Large Print Browsers

E-mail Access

- Besides web access, e-mail is also an important tool on the Internet.
- There are also special e-mail software, as well as web service sites for use by people with disabilities (ref: Unit Reader 13 page 954).