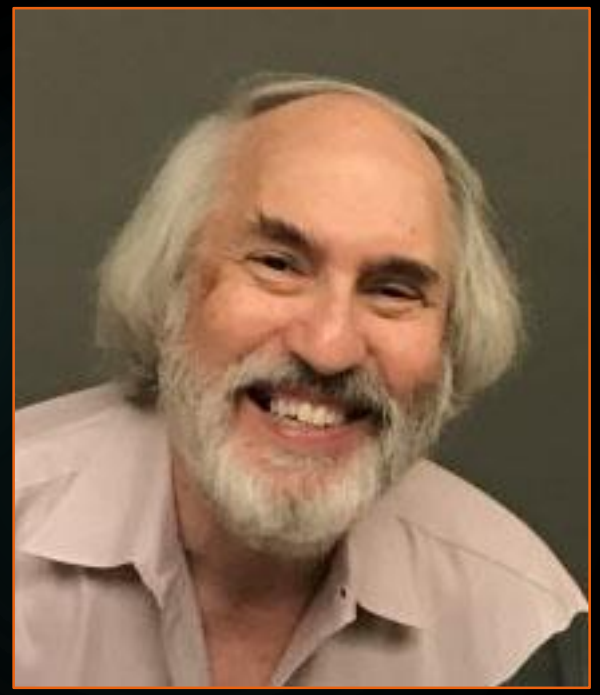
January 31, 2023

Bionic Ears: Cochlear Implants and the Future of Assistive Technology

ENGR110/210
Perspectives in Assistive Technology



David L. Jaffe, MS

Instructor

17

Years

Questions, Comments, Suggestions, or Concerns?

Please notify me of your comments, suggestions, and concerns so I can explain / address / correct them.

Upcoming class sessions

- From DIY to Disability Dongles: Spanning Accessibility Space from Indispensable to Irrelevant –
  Joshua A. Miele, PhD - Thu, Feb 2nd
- Issues of Human Interface Design –
  Gary M. Berke, MS, CP, FAAOP - Tue, Feb 7th
- Assistive Robotics –
  Monroe Kennedy III, PhD - Thu, Feb 9th
- Mid-term Student Project Presentations –
  Tue, Feb 14th

Cool Student Project Names

- Playground Pals — **Accessible and Inclusive Playground Attractions (1)**
- Mother Mary — **Aesthetic Prosthetic Leg Project**
- iPhone 4 — **iPhone Project with Danny**
- Su-paw-star Solutions — **Water Bowl for Danny's Service Dog Korey**
- Funtastic Four — **Accessible and Inclusive Playground Attractions (2)**
- Team D.U.G — **Communication Aid for Nathan**
- Live Laugh Leash — **Leash Project for Danny and Korey**
- Tech-Support on the Go — **Mobile Laptop and iPad Computer Support for Abby**
- No Bad Vibes — **Bass Reduction Project**

Students working on Team Projects

- Connect with project partner
- "Understand the Problem"
- Brainstorming
- Select Design Concept(s)
- Sketches, low resolution prototypes
- Prepare for Mid-Term presentation and Report
- Contact me if you have questions about your project direction
- Weekly - Meet with me or Ayano to report on project progress
- Submit progress reports to both Ayano and me

Students working on Team Projects
Mid-term Presentations in two weeks!

- Mid-term presentations will be 7 minutes
- Project title, background, problem, aim, design criteria, "understanding the problem" & brainstorming activities, prototypes, and selected solution
- PowerPoint slides - Google Docs
- Strive to be professional
- Include feeling & emotion
- Presentation tips on course website
- Signup Sheet for presentation order will be available in class next Tuesday

Students working on Team Projects
Mid-term Report

- Mid-term report - 10 to 15 pages of narrative and images
- Include legible sketches and photos
- Goal: short, concise, well-written, and highly readable report with few grammatical and spelling errors.
- Report Writing Tips webpage documents suggested report features

Students working on Individual Projects

- Submit project name
- No mid-term presentation
- Contact me if you have questions about your project direction
- Weekly - Meet with me or Ayano to report on project progress
- Submit progress reports to both Ayano & me

Reminder - Work with Diligence

- Time is your team's most precious resource
- 2 weeks of class until Mid-term Presentations - Tue, Feb 14th
- It is not too early to outline your presentation & report

Overview of Accessibility

A11y

What is Accessibility?

Accessibility is a:

- Property
- Design concept
- Design specification
- Design consideration
- Design goal
- Product feature

Properties: Readability, flexibility, visibility, permeability, drivability, durability,

What is Accessibility?

That enables people:

- Individuals with disabilities:
  - Sensory
  - Physical
  - Cognitive
  - Neurological
- Older adults
- Kids
- Everyone

What is Accessibility?

To better interact through:

- Sight
- Sound
- Touch
- Smell
- Mobility
- Understanding
- Communication
- Manipulation
- Teaching / learning

What is Accessibility?

With the real world:

- Other people
- Infrastructure:
  - Buildings
  - Institutions
  - Transportation systems
- Products:
  - Computers
  - Internet
  - Websites
  - Household items
  - Office items

What is Accessibility?

Through an enhanced hardware and / or software user interface:

- Alternate ways
- Augmented ways
- Customized ways
- Preferred ways

What is Accessibility?

For these purposes:

- Education
- Vocation
- Recreation
- Daily living

Little Things Do Make A Difference

Little Things Do Make A Difference
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Little Things Do Make A Difference

The Goal of Accessibility

The ultimate goal of the accessibility movement is to ensure that everyone - regardless of ability or disability - has an equal chance to participate in society. In the face of constant technological change, this becomes more difficult but also extremely necessary. The only way to allow people with disabilities to engage fully in the activities that interest them is to give them access to all the possibilities open to everyone else, including those offered by twenty first century technology.

Accessible Technology in the 21st Century

- The Future

Examples of Devices that Provide Accessibility

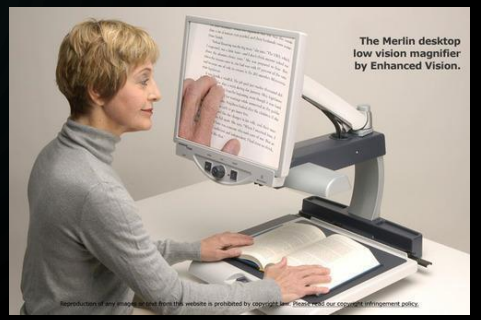
Building Access

- Door Opener
- Ramps
- Workspaces
- Signage
- ATMs

Computer Accessibility

As the computer age continues, more and more technology is being created to make computers and the internet accessible for people of all ability levels.

For **visually impaired users**, programs offer audio description or screen reading, while monitor settings can be modified to make visual reading easier or Braille embossers can be added as alternative output devices.

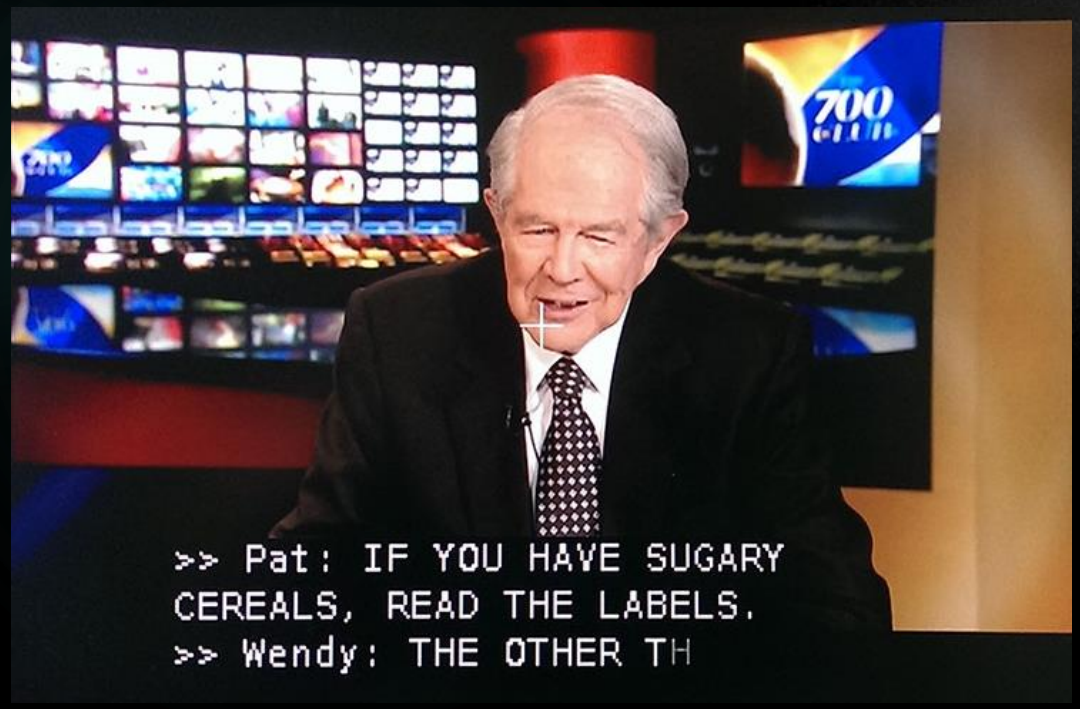


Accessible Technology in the 21st Century

- Introduction

Computer Accessibility

For **individuals with hearing difficulties**, captioning and visual notifications instead of sound can offer more freedom in using a computer.



Accessible Technology in the 21st Century

- Introduction

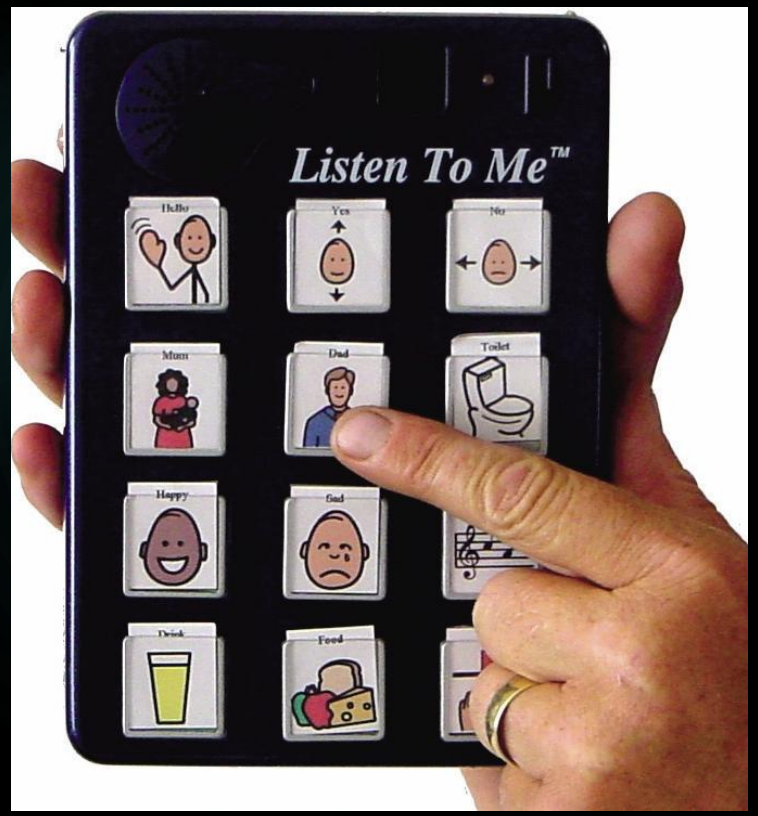
Computer Accessibility

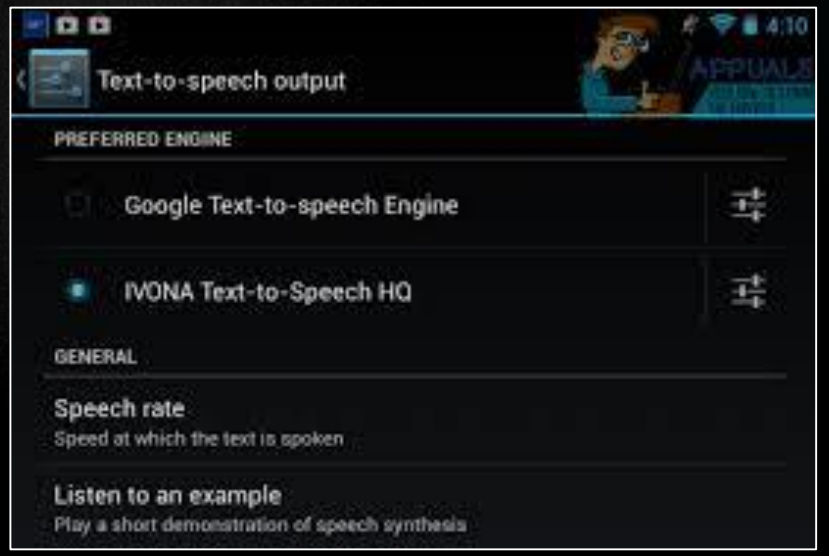
Adaptive keyboards and mice allow **people with motor disabilities** to get their input into a computer, while speech recognition is software that allows control of a computer by voice.

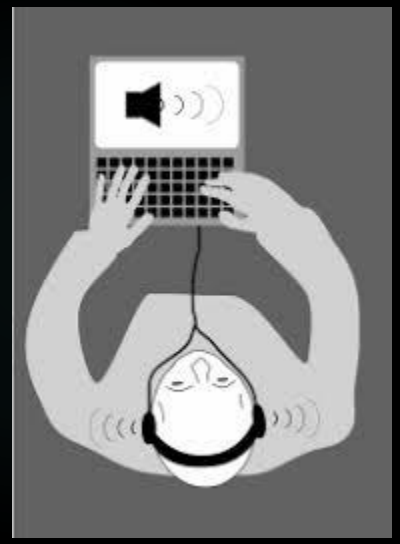
Accessible Technology in the 21st Century

- Introduction

Communication Accessibility







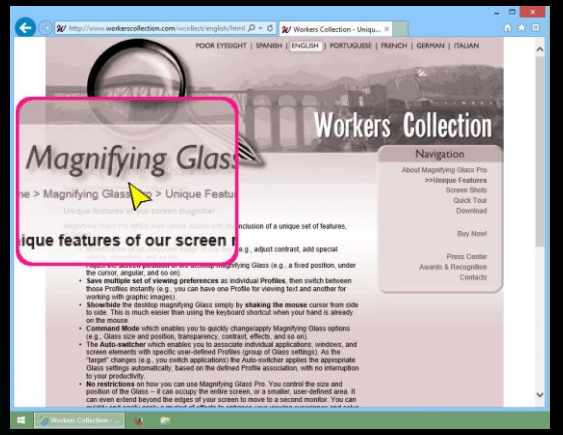
Accessible Technology in the 21st Century

- Introduction

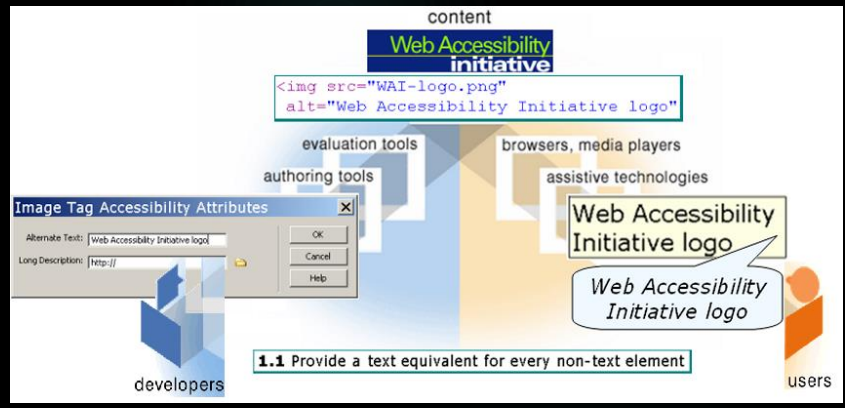
Examples of Devices that Provide Accessibility

Computer Access

- Alternative Mouse
- Alternative Keyboard
- Screen Readers
- Voice Recognition
- Screen Magnifiers
- Braille Displays
- Captioned videos



Accessible Webpages



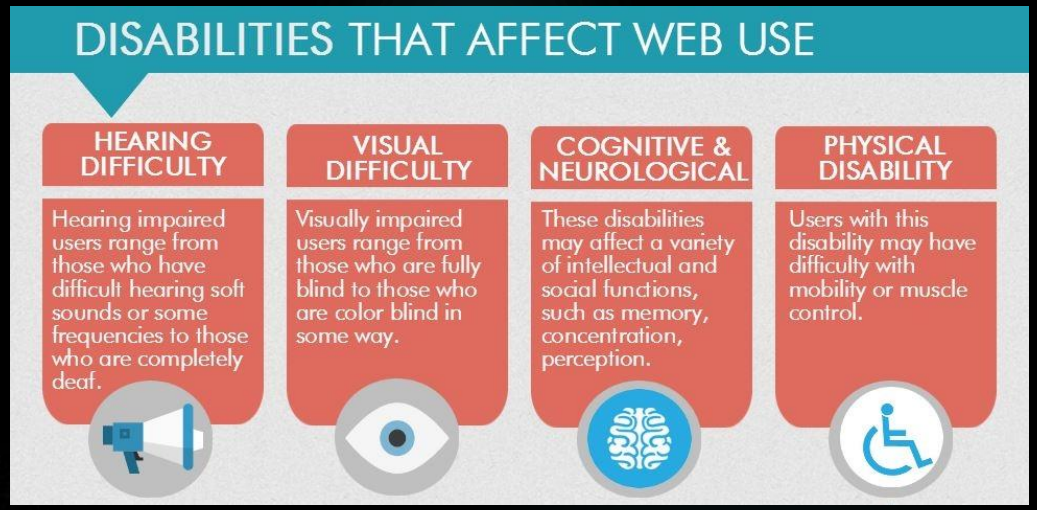
WCAG Guidelines (1 of 2)

- Provide equivalent alternatives to auditory and visual content
- Don't rely on color alone
- Use markup and style sheets and do so properly
- Clarify natural language usage
- Create tables that transform gracefully
- Ensure that pages featuring new technologies transform gracefully
- Ensure user control of time-sensitive content changes

Accessible Technology in the 21st Century

- Website Accessibility

Accessible Webpages



WCAG Guidelines (2 of 2)

- Ensure direct accessibility of embedded user interfaces
- Design for device-independence
- Use interim solutions
- Use W3C technologies and guidelines
- Provide context and orientation information
- Provide clear navigation mechanisms
- Ensure that documents are clear and simple

In Summary

Accessibility is the design goal, feature, or criteria that allows people of differing abilities to share common resources.

In Summary

Examples of shared common resources are:

- buildings
- transportation systems
- consumer products including computers and software
- institutions such as schools, banks, government facilities, libraries, voting places
- facilities such as parks, playgrounds, beaches
- information systems such as books and the internet

In Summary

In many instances, the use of an assistive technology device can provide needed access to an otherwise inaccessible resource.

Thursday, February 2nd

From DIY to Disability Dongles: Spanning Accessibility Space from Indispensable to Irrelevant

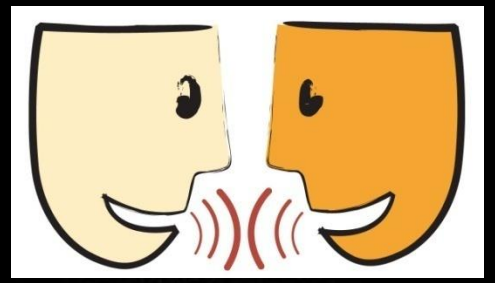
Joshua A. Miele, PhD
Amazon Lab 126

Today

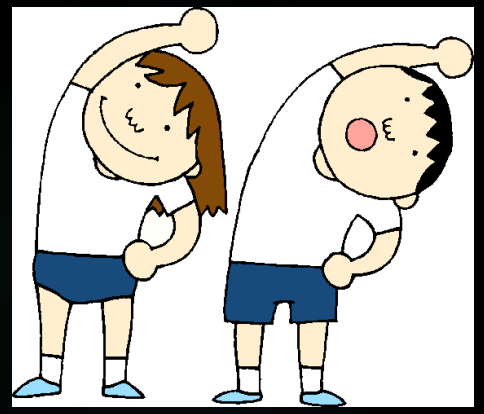
Bionic Ears: Cochlear Implants and the Future of Assistive Technology

Lindsey Dolich Felt, PhD
Stanford University - Program in Writing and Rhetoric

Break Activities



- Breakout rooms
- Attendance sheet
- Stand up and stretch
- Take a bio-break
- Text message
- Web-surf
- Respond to email
- Talk with classmates
- Reflect on what was presented in class



Short Break