What is this person doing?
• Age explorer suit
• Furniture design
• 20-25 years older
• Binding restrict movement of joints
• Eye glasses double vision
• Hearing limitation
• Tight gloves simulate arthritis
• Visor simulates clouded vision
Lecture 16: Accessibility and Universal Design

April 7
Today’s Topics

• Universal Design
  – Guest Speakers
    • Robin Brewer
    • Sureyyah Tarkan

• Assistive technology
JitterBug One Touch
Welcome to NIH Senior Health. This easy-to-use website features basic health and wellness information for older adults from the National Institutes of Health. Use the buttons at the top of each page to make the text bigger, change text color, or hear the text read aloud.

Find a health topic by:

First letter
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Categories
- Bones and Joints
- Cancer
- Diseases and Conditions
- Healthy Aging
- Memory and Mental Health
- Treatments and Therapies
- Vision and Hearing

Featured Topic
Senior friendly site design considerations

• High contract text/background
• Sans-serif font like Arial
• Text-relevant images only
• Descriptive tags and alternate text
• Optimize video and graphics to reduce download time
• Limited animation and applets
• Simple, consistent navigation
• Label links and icons
Typical lesson plan for seniors

- Computer literacy and mouse skills
- Basic internet and email
- Search engines and senior sites
- Online catalog and electronic resources
Factors to consider

- **Anxiety** – technophobia, intimidation, fear of change or damaging the equipment
- **Self-Efficacy** – the willingness to “try, try again!”
- **Attitudes toward Aging** – positive or negative
Guest Speakers

• Robin: **Kids Team**

• Sureyya: **Designing a Cooking-Based Programming Language For and With Children**
Yahoo in different countries
UK, China, Japan, Korea
Principles of universal design

1. Equitable use
2. Flexibility in use
3. Simple and intuitive to use
4. Provide perceptible information
5. Tolerance for error
6. Low physical effort
7. Size and space for approach and use
Principles of universal design

1. Equitable use:
   - The design does not disadvantage or stigmatize any group of users
   - E.g., mouse for lefties

2. Flexibility in use:
   - The design accommodates a wide range of individual preferences and abilities
   - E.g., beginner, intermediate, expert modes
Principles of universal design

3. Simple and intuitive
   – Each to learn regardless user’s experience, knowledge, language skills, concentration level

4. Provide perceptible information
   – The design communicates necessary information to the user regardless of ambient conditions or the user’s sensory abilities
Principles of universal design

5. Tolerance for error
   - Design minimizes hazards and the adverse consequences of accidental or unintended actions.
   - E.g., baby proof

6. Low physical effort
   - Design can be used efficiently and comfortable, with a minimum fatigue.
   - E.g., Ergonomic chair, keyboard
Principles of universal design

7. Size and space for approach and use
   – People can reach, manipulate, and use regardless of their body’s size, posture, or mobility
Caveat

• Good universal design should not sacrifice basic usability attributes for typical users

• Example:
  – Sidewalk curb
  – Revolving door
Activity:
Most Inaccessible ATM

- Pick a user population
- Propose design to violate the principles listed below on purpose

1. Equitable use
2. Flexibility in use
3. Simple and intuitive to use
4. Provide perceptible information
5. Tolerance for error
6. Low physical effort
7. Size and space for approach and use
Section 508

• Section 508 of the Rehabilitation Act Amendments of 1998

• Apply to electronics and information technology procured, developed, used, and/or maintained by Federal departments and agencies
Examples of assistive technologies

• Output
  – Screen readers
  – Screen enlargers
  – Braille display
  – Assistive listening devices
  – Color adjuster/overlay
  – Text summarization software

• Input: Pointing
  – Eye head tracker
  – Puff-and-sip
  – Mouse keys

• Input: Typing
  – Voice input
  – Keyboard filters
Types of impairment

- Hearing
- Visual
- Speaking
- Motor
- Cognitive
Speaking

• Augmentative and Alternative communication devices
  – Supplement or replace speech and writing
  – Help people whose speech and writing are temporality or permanently impaired
  – Meet people’s commutation needs
Switch-operated speech generating device
GoTalk 20
GoTalk 20

- Helpers pre-record messages
- Users select messages to play
- 100 message capacity
  - (20 keys x 5 levels)
Motor

- Tremor and spasms
- Muscle weakness and fatigue
- Paralysis
• Cerebral Palsy
  – Rapid but inaccurate

• Muscular dystrophy
  – Slow but accurate
<table>
<thead>
<tr>
<th>Font</th>
<th>Style</th>
<th>Size</th>
<th>Underline Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arial</td>
<td>Regular</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Arial Black</td>
<td>Italic</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Comic Sans MS</td>
<td>Bold</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Courier New</td>
<td>Bold Italic</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Franklin Gothic Mediam</td>
<td>Italic</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Garamond</td>
<td></td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td></td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Helvetica</td>
<td></td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Latha</td>
<td></td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Lucida Console</td>
<td></td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Lucida Sans Unicue</td>
<td></td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Microsoft Sans Serif</td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Modern MS Sans Serif</td>
<td></td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>MS Serif</td>
<td></td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Myriad</td>
<td></td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Palatino Linotype</td>
<td></td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Roman</td>
<td></td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Schrift</td>
<td></td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Small Fonts</td>
<td></td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Times New Roman</td>
<td></td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>

Preview: Times New Roman
This question is for testing whether you are a human visitor and to prevent automated spam submissions.

**What code is in the image?:** *

Enter the characters (without spaces) shown in the image.
Accessible Captcha
Blind people’s questions

- What denomination is this bill?
- What temperature is my oven set to?
- Can you please tell me what this can is?
- What color is this pillow?
- What kind of drink does this can hold?
Get answers by taking pictures

What denomination is this bill?

Can you please tell me what this can is?
Find objects by taking pictures

Where is the Wheaties?
Cognitive difficulties

• Difficulty focusing
• Difficult comprehending text
• Get confused easily by complex layouts or inconsistent navigational schemes
• Get distract easily (ADHD) by animated images or irrelevant information
We are all disabled

• Environment / situational disabilities
  – In a foreign country
  – In a bouncing vehicle
  – In the dark
  – In a noisy place

• Physical conditions
  – Sleepy
  – Drunk
  – Fever
  – Injured fingers
  – Broken thumb
  – RSI