INTRODUCTION TO USER INTERFACE DESIGN
QUESTIONS

1. When was the last time you bought something that was technologically complex?
   - Examples:
     - I-pad (or some other tablet PC)
     - New Cell-Phone
     - New Game System (Xbox, Wii, etc.)
     - New Car
     - GPS Device
     - New Computer
     - New Software Program (game)

2. Did you read the manual?

Most people don't.
IPAD
MICROSOFT SURFACE
In 1988, Donald Norman applied the term "affordances" to the context of human–machine interaction. He used the term to refer to those action possibilities which are readily perceivable by an actor. The term can be applied to both physical objects (a mouse) and virtual objects (the pointer on the screen). When we create an object and display it on a screen, how is it perceived by a user? Specifically, what actions will a user think that the object can enable.

Question: Can we design an interface where the user easily can perceive what actions s/he needs to take to generate the results s/he desires?
“Affordances”

The Design of Everyday Things

Donald A. Norman
Mnemonic for Affordances

- A mnemonic device is any learning technique that helps you to remember something.

- Specifically, when you try and remember what "affordances" is all about. Remember the doors...

- On the next page are two doors, for each door, would you push or pull?
The door you push leads to safety! Quick! Which door do you use?
PERCEIVE “ACTION POSSIBILITIES”? 
“More than 2,500 of the 3,250 walk buttons that still exist function essentially as mechanical placebos, city figures show.”
(2004 NY TIMES)
**Design Principles**

- In the world of design, what matters is:
  - If the desired controls can be perceived.
    - In an easy-to-use design, if they can both readily be perceived and interpreted.
  - If the desired actions can be discovered.
    - Whether standard conventions are obeyed’

- Four principles for interface design:
  1. Follow conventional usage, both in the choice of images and the allowable interactions.
  2. Use words to describe the desired action (e.g., “click here” and other labels).
  3. Use metaphor.
  4. Follow a coherent conceptual model so that once part of the interface is learned, the same principles apply to other parts.
Remember:
- Some devices/interfaces force functionality;
  - e.g., starting a car requires a key.
- Design for error
  - Expect that the user will make errors
  - Figure out what those errors might be
  - Plan for these errors:
    - Eliminate them if you can.
    - Otherwise plan to handle them!
**Eight Rules of Interface Design** *

- Be consistent
- Aim for universal usability
- Provide helpful feedback for every user action
- Provide closure with dialogs
- Prevent errors where possible and otherwise handle errors elegantly
- Allow reversal of actions
- Make users feel in control (“internal locus of control”)
- Limit storage/memory load

* Source: Andrew Johnson (2006): http://www.evl.uic.edu/aej/422/
Universal Usability (Fire Door)
RECOMMENDATIONS

Real estate:
- How much space do you have?
- How much space will things take up?
- Where will the user have the controls?
  - On the screen and in the real world.
- Where will they want to move the controls?
  - On the screen and in the real world.

Use of color:
- Be aware of color blindness
- Limit the number of colors
- Use color to group things (that you want to group together)
- Use color to support a task (e.g., brightness = easy to find)
- Remember color conventions (e.g., red, yellow, green)
RECOMMENDATIONS (CONT)

- Grouping of objects
  - Group related objects together
    - Visual hierarchy can reflect object hierarchy (menus, levels)
    - Visual relationships: position, size, “weight” (ownership, links)
  - Balance (use it!)
    - Use symmetry to ensure balance.
    - Color effects perceived balance.
  - Clutter (avoid it!)
    - Relegate nonessential items to other areas (other pages, screens, pop-up boxes).
RECOMMENDATIONS (CONT)

- **Ask yourself: where does the eye naturally go?**
  - Use alignment to establish visual relationships between objects.
  - Consider human optical adjustment
    - Use the “squint” test to see if things you want to stand out, do stand out
    - Don’t make the eye wander all over back and forth across the screen
  - Use “negative space” or “white space”
    - This refers to space that is not what you want the user to look at, but space that helps separate items and clarify the visual elements in a design
VISUAL HIERARCHY
THINGS TO AVOID

- Things that don’t work as expected.
  (Surprise! It's not a picture, it's a button.)
- Different things that are too similar
- Things that are hard to see
- Things that don’t work well together
- Things that get in the way
- Things that are hard to handle
- Things that are hard to remember
- Things that don’t fit
- Displays that look like controls
- Incompatible/unexpected/unnatural mapping of controls to devices
## Look for Bad Design...
You'll find it everywhere

<table>
<thead>
<tr>
<th>This composition is:</th>
<th>Style copied from:</th>
<th>Delete this!</th>
<th>Delete this!</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Get your tone of voice right
- Consult a graphic designer
- Break the grid
- Style over content
- This is irrelevant
- Does not stand out
- Keep it simple
- Lost interest here
- Good idea wasted by poor execution
- Awful library stock photo
- Microsoft Word™ is not a design tool
- Unnecessary use of Photoshop™ effect
- Warning: low resolution image
- Make [ ] consistent
- BAD IDEA
- BAD IDEA

Design Police are operating in this area
THE END