Announcement: Quiz #1

Quiz # 1

- Tuesday, Sep. 5 in class
- Via Blackboard – Bring your laptop to class!
- Open book and open notes

Team Assignment Update

~4-5 students (U/G) in one team

Case 1:

- Assigned team members based on background and interests
- Each team may consist of people with different skills

Case 2: self-nominations

- Form your own team
- Send me an email by 11:59pm, Sunday, Sep. 3
  - a list of team members
  - copy to all team members

Today's Agenda

- Design principles

Review: Goals of HCI

- **Usability goals**

1. Easy to use (effectiveness)
2. Efficient to use (efficiency)
3. Safe to use (safety)
4. Having good utility (utility)
5. Easy to learn (learnability)
6. Easy to remember how to use (memorability)

- **User experience goals (UX goals)**
- Increasing positive/desirable emotional and felt experience
- Decreasing negative/undesirable emotional and felt experience

Review: Interactive Design Process

Four basic activities:

- Establish requirements
- Design alternatives
- Make prototype
- Evaluate

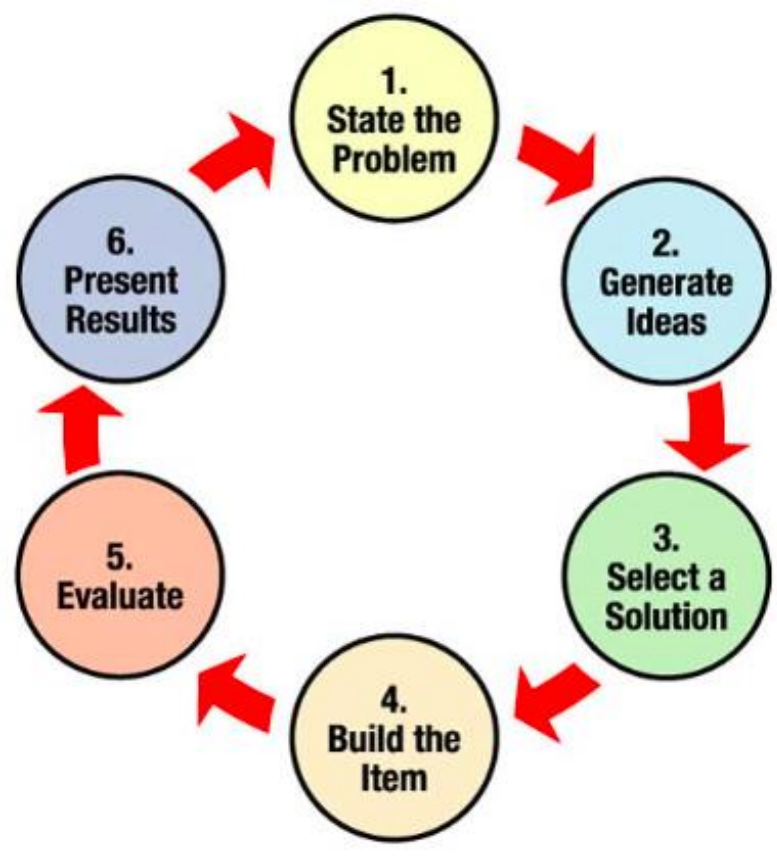
The process is executed iteratively

Review: System design process

Characteristics of the process

- Work from general to specific
- Design options have to satisfy system requirements
- Constraints (time & money)
- Iteration

Review: Process Cycle



The details of these different design cycle examples are less important than the idea that design is **ITERATIVE**!

Case Study

Suppose you are designing an online learning system.

What would be the design process?

First step?

HCI Design Principles

Recall: What is HCI?

HCI is concerned with the design, evaluation, and implementation of **interactive computing systems for human use.**

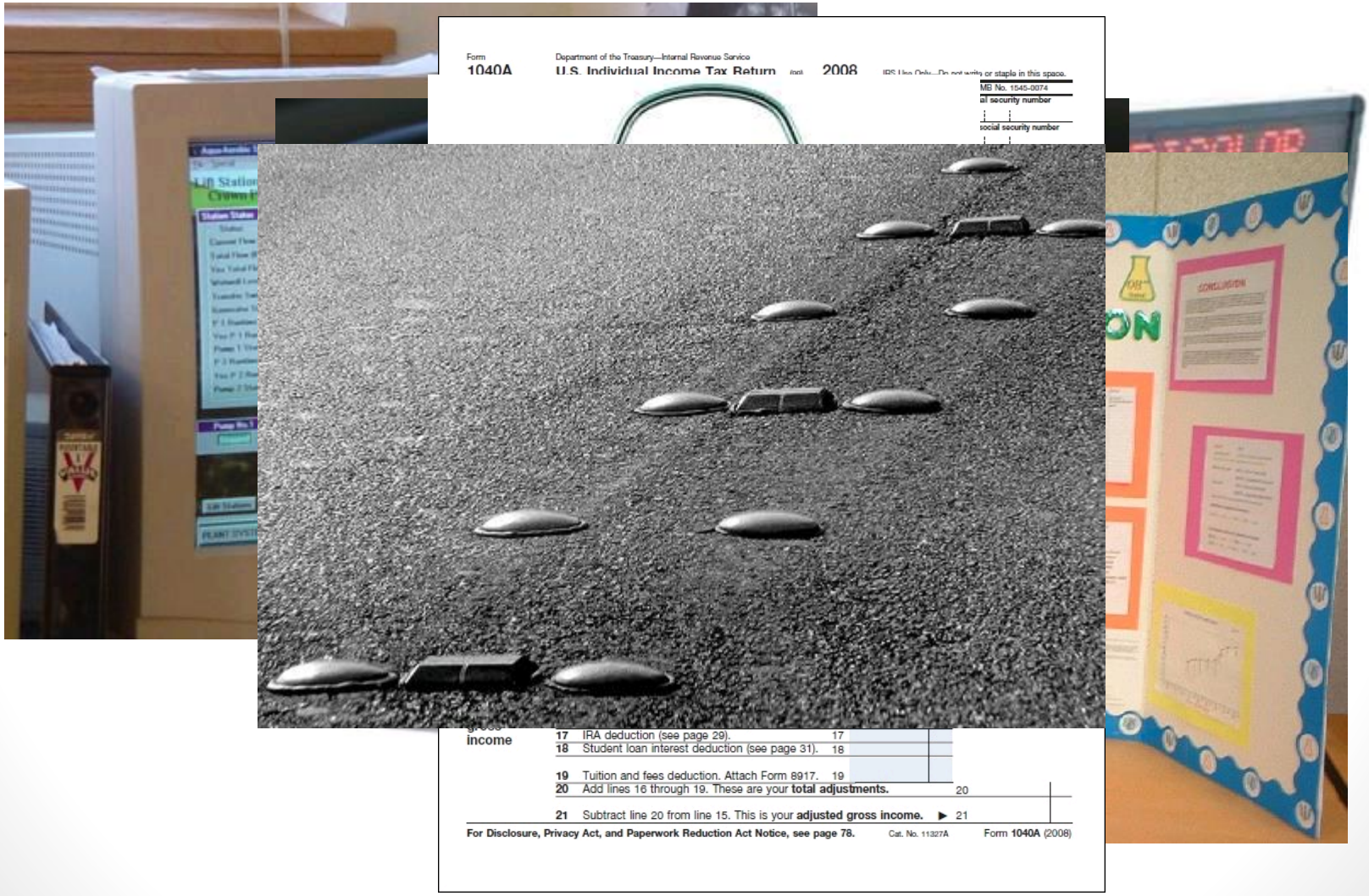
Recall: What is an interface?

Human-made artifact

Act as a medium between information in a system and the operator

- Tell the operator what the system is doing
- Tell the operator what needs to be done
- Tell the operator how the system functions
- Alert the operator if there is something wrong

What is an Interface?



This class will…

- Make you see everyday things in a new light
- A “critical eye” for design

Designing with User in Mind…

For the designer to keep usability in mind, there are several design principles to follow….

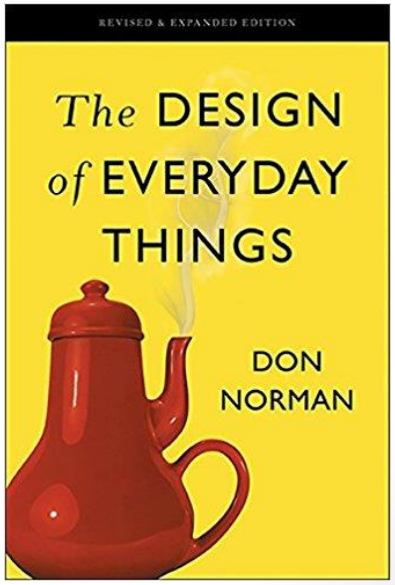
Don Norman's Six Design Principles (ID Ch. 1)

1. Visibility – Can I see it?
2. Feedback – What is it doing now?
3. Affordance – How do I use it?
4. Mapping – What is the relationship between things?
5. Constraint – Why can't I do that?
6. Consistency – I think I have seen this before?

Don Norman

- Cognitive scientist, computer scientist, psychologist, designer, and engineer
- Was a university professor at UCSD and Northwestern Univ.
- A co-founder of Nielsen Norman Group
- Previously with Apple, HP, etc.
- “Design of Everyday Things”

https://www.jnd.org/about.html



1. Visibility

- When capabilities are visible, it does not require memory of how to use

- Can see states of devices and possible actions
- Buttons/knobs are organized to be found and used easily

1. Visibility

Can you figure out how to use it?

Are two functions clear and independent?

1. Visibility

- When functionality is hidden, problems in use occur
  - Occurs when the number of functions is greater than the number of controls

Can you figure out how to use it?

Are two functions clear and independent?

1. Visibility

Visible knobs, dials and buttons have been replaced by sensor-based invisible controllers technologies

- Examples:
  - Zoom- in/out functionality of touchscreen
  - Motion-based light switches
  - Gesture-based gaming

- What are their potential issues?

1. Visibility

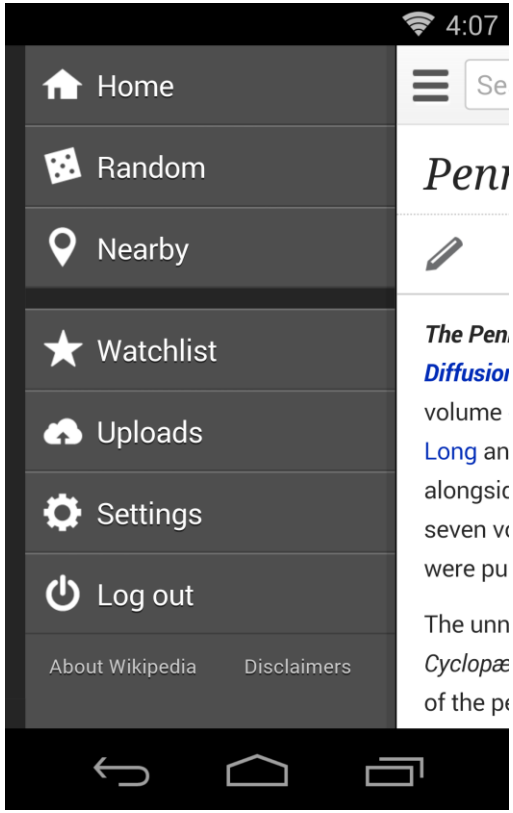
Do we have to show everything?

Problem: Cluttered interface if showing everything

- Hiding some functions can be advantageous in interface design
- Some functions are kept invisible until needed
- A structure that groups similar types is helpful
- An extreme example – Google search

1. Visibility

Hamburger menu vs Tab bar in navigation



https://commons.wikimedia.org/wiki/File:Editing_Wikipedia_mobile_screenshot_p_16,_Penny_Cyclopaedia_with_menu.png

2. Feedback

Let someone know what just occurred

- Can be a sound that is made
  - E.g., keyboard and mouse clicks, earcons
- Can be change in physical state
  - E.g., changes in display, color, light
- What are desirable features of feedback?
  - Salient, prompt, user-friendly…

2. Feedback


14
15
10
11
12
7
8
9
4
5
6
3
2
0
B
EXECUTIVE OFFICES
POOL HEALTH CLUB


1.5
1.0
2.0
SAGA
0.5
Bar
0
TURBO
0.2
0.4
0.6
0.8


HP 35s
Scientific Calculator

2. Feedback

Other examples of feedback?

- Progress bars
- Error messages
- Confirmation page
- And more

3. Affordance

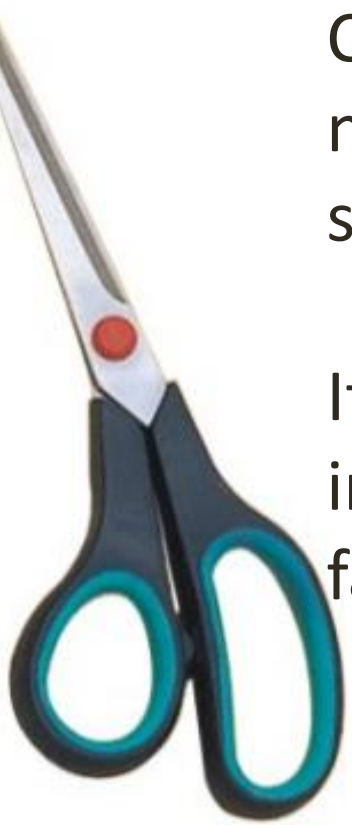
Affordance ≠ if the product is affordable

- Perceived and actual properties of an object that give clues to its operation

Chair is for sitting
Ball is for throwing
Button is for pushing

3. Affordance

- Perceived and actual properties of an object that give clues to its operation



Complex things may need explanation but simple things should not

If a simple thing requires instructions, it is likely a failed design

3. Affordance

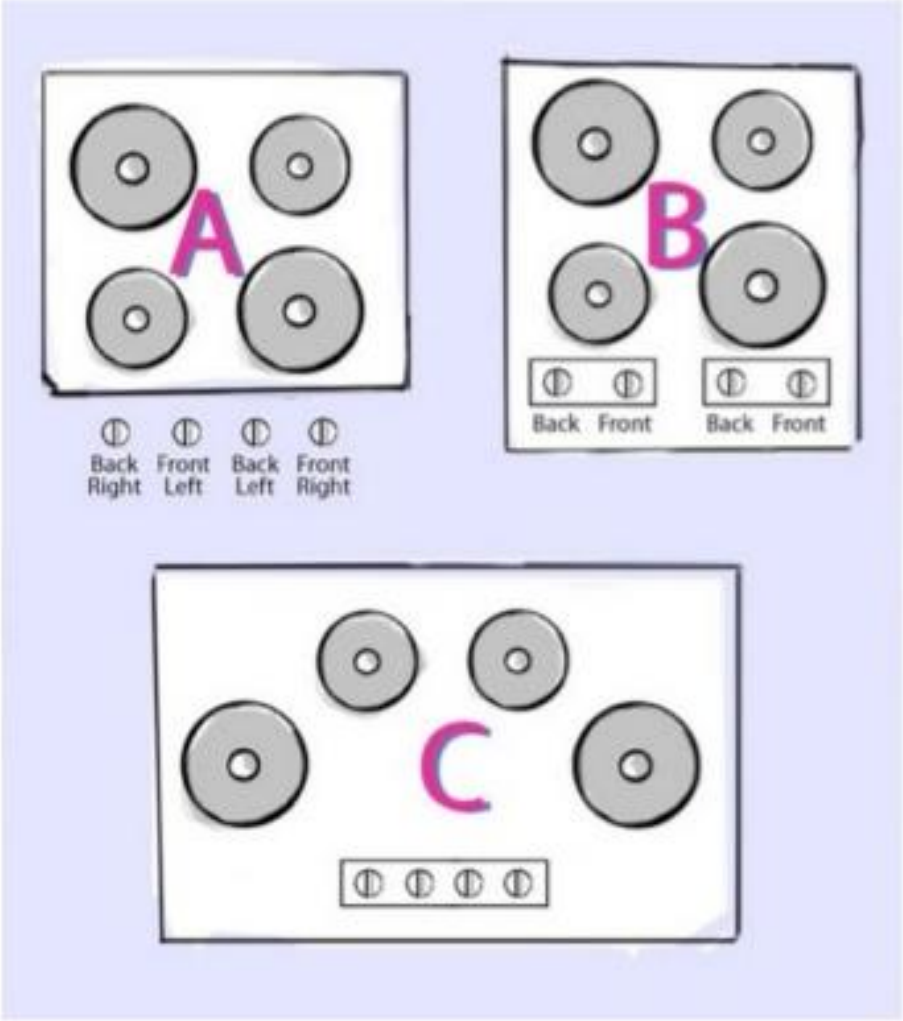
- Other examples of affordances in everyday interactions?

4. Mapping

- Relationship to controls and their effect

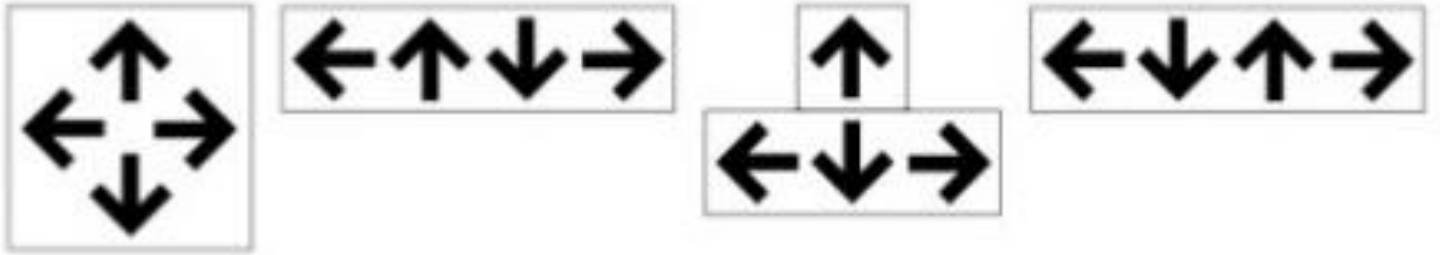
4. Mapping

Relationship to controls and their effect



4. Mapping

Relationship to controls and their effect

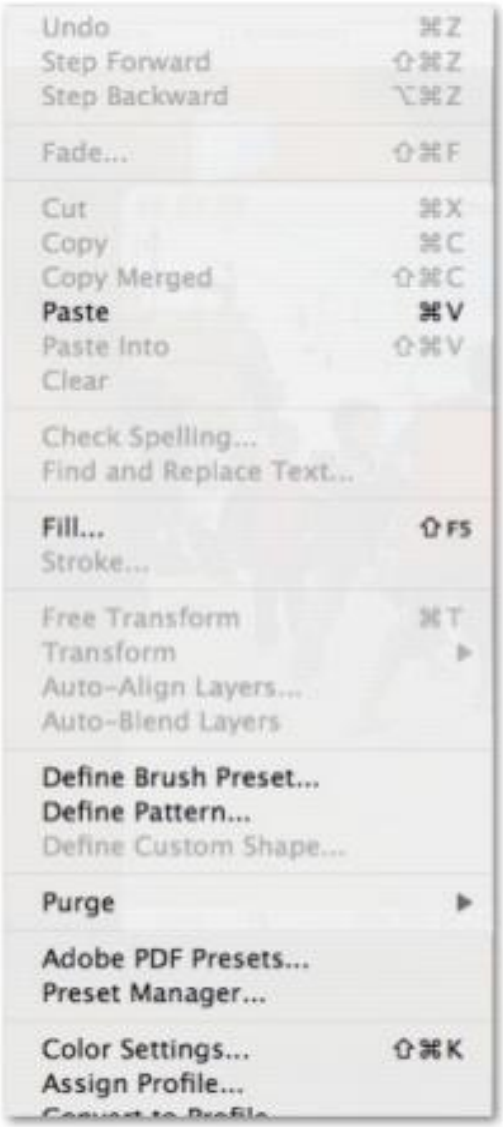


5. Constraints

Restricting the kind of interactions that can take place

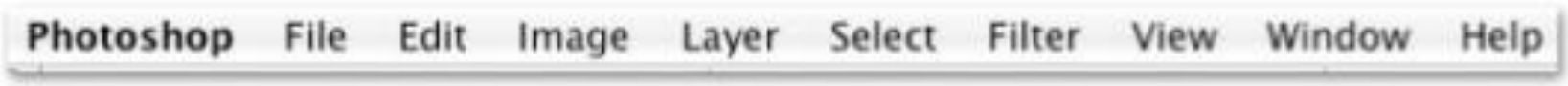
5. Constraints

- Restricting the kind of interactions that can take place
- Reduce the chance of error
- Can also work to focus user's attention to needed task



6. Consistency

- Designing interfaces that have similar operations and use similar elements for achieving similar tasks
- Easy to learn and use



6. Consistency

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Why Design is Hard…

- Tradeoff when applying multiple design principles
- Number of things to control has increased dramatically
- Displays are more virtual/artificial
- Marketplace pressure
  - Adding operations cheaper (computers)
  - Adding controls expensive (real estate, cost)
- Errors becoming increasingly serious

Try and Try Again

Norman thinks that it often takes 5 or 6 tries to get something “right”

Questions?

- That's all for today!
- What's next?
  - We have talked about setting a foundational knowledge of what HCI is all about
  - Next, we start working in groups!
    - Next Thursday – group assignment and examples of past projects
    - Project management
    - Start thinking about topics/ideas over the weekend!