Coming up

- Thursday, March 7:
  - Midterm assessment
    - 20 minutes at start of class
    - you give me feedback to help me teach you better
  - Exam review
- No class March 12 and 14
- Exam March 14, 7-9 PM
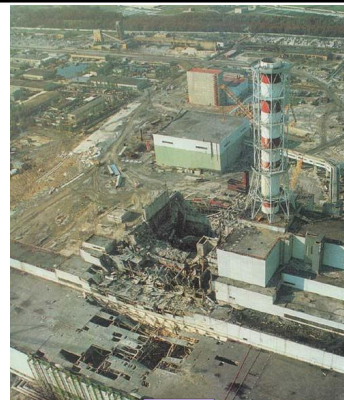 Agricultural Engineering building, room 119

Beta

- Due April 2nd

- Long time away but there is a lot to be done

- Meet weekly, follow the schedule

User Interface

Three Mile Island

Chernobyl

How do we avoid bad UI?

- Learn from past mistakes

- Build prototypes

Big questions

- What's the point of prototyping? Should I do it?
  - If so, when should I?

- Should I make my prototype on paper or digitally?

- How do I know whether my UI is good or bad?
  - What are the ways in which a UI quality can be quantified?
  - What are some examples of software you use that have an especially good/bad UI?
    What do you think makes them good/bad?

Usability and software design

- **usability**: the effectiveness of users achieving tasks
  – Human-Computer Interaction (HCI).
  – Usability and good UI design are closely related.
  – A bad UI can have serious results…

Achieving usability

- User testing and field studies
  – having users use the product and gathering data
- Evaluations and reviews by UI experts
- Prototyping
  – Paper prototyping
  – Code prototyping

- Good UI design focuses on the *user*
  not on the developer, not on the system environment

Prototyping

- **prototyping**: Creating a scaled-down or incomplete version of a system to demonstrate or test its aspects.

- Reasons to do prototyping:
  – aids UI design
  – provides basis for testing
  – team-building
  – allows interaction with user to ensure satisfaction

Some prototyping methods

1. UI builders (Visual Studio, ...)
   draw a GUI visually by dragging/dropping UI controls on screen

2. implementation by hand
   writing a quick version of your code

3. **paper prototyping**: a paper version of a UI

Why do paper prototypes?

- much faster to create than code
- can change faster than code
- more visual bandwidth (can see more at once)
- more conducive to working in teams
- can be done by non-technical people
- feels less permanent or final

Where does paper prototyping fit?

When in the software lifecycle is it most useful to do (paper) prototyping?

- Requirements are the what and design is the how. Which is paper prototyping?

- Prototyping
  – helps uncover requirements and upcoming design issues
  – during or after requirements but before design
  – shows us what is in the UI, but also shows us details of how the user can achieve goals in the UI

Paper prototyping usability session

- user gets tasks to perform on a paper prototype
- observed by people and/or recorded
- a developer can "play computer"
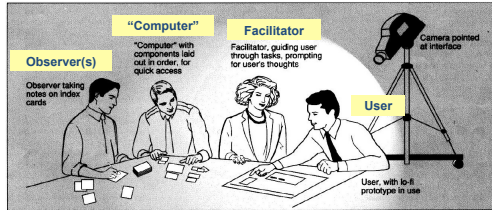
Schneiderman's 8 Golden Rules

1. Strive for consistency.
2. Give shortcuts to the user.
3. Offer informative feedback.
4. Make each interaction with the user yield a result.
5. Offer simple error handling.
6. Permit easy undo of actions.
7. Let the user be in control.
8. Reduce short-term memory load on the user.
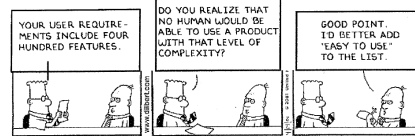
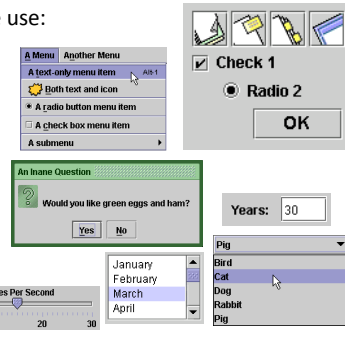*(from Designing the User Interface, by Ben Schneiderman of UMD, noted HCI and UI design expert)*

UI design examples
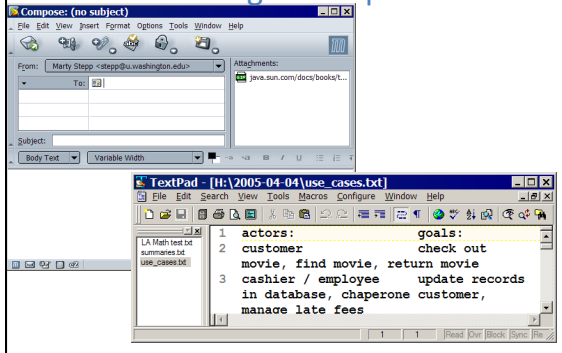
UI design, components
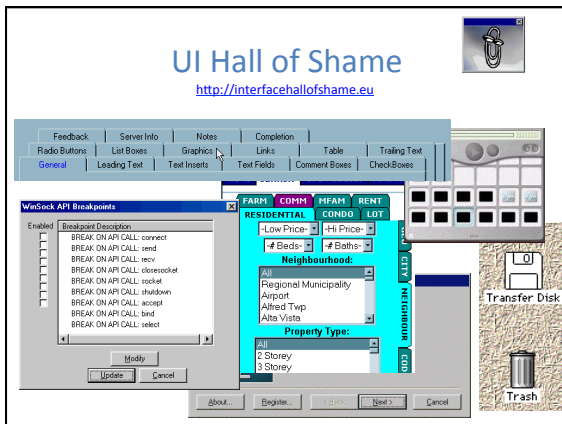
- When should we use:
  - A button?
  - A check box?
  - A radio button?
  - A text field?
  - A list?
  - A combo box?
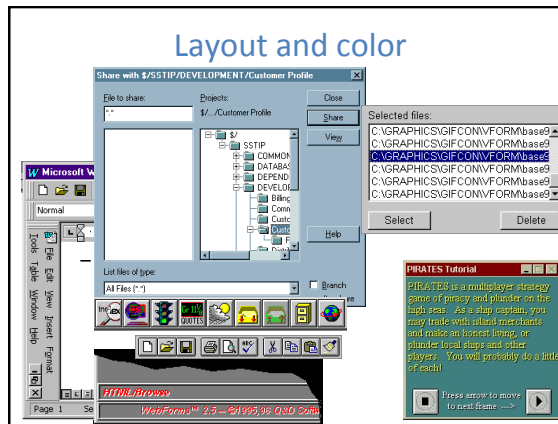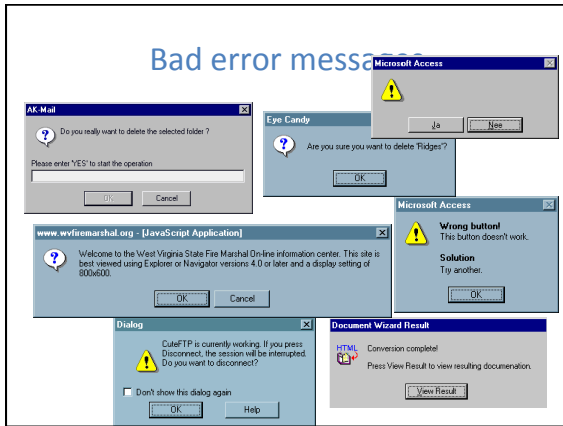 - A menu?
  - A dialog box?
  - Other..?

UI Hall of Shame

http://interfacehallofshame.eu

Layout and color

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Bad error messages

UI design – buttons, menus

- Use **buttons** for single independent actions that are relevant to the current screen.
  - Try to use button text with verb phrases such as "Save" or "Cancel", not generic: "OK", "Yes", "No"
  - use Mnemonics or Accelerators (Ctrl-S)
- Use **toolbars** for common actions.
- Use **menus** for infrequent actions that may be applicable to many or all screens.
  - *Users hate menus!* Try not to rely too much on menus. Provide another way to access the same functionality (toolbar, hotkey, etc.)

UI design – checkboxes, radio buttons

- Use **check boxes** for independent on/off switches
- Use **radio buttons** for related choices, when only one choice can be activated at a time

UI design – lists, combo boxes

- use **text fields** (usually with a label) when the user may type in anything they want
- use **lists** when there are many fixed choices (too many for radio buttons); *all* choices visible on screen at once
- use **combo boxes** when there are many fixed choices; don't take up screen real estate by showing them all at once
- use a **slider** or **spinner** for a numeric value

An example UI

- Good UI dialog?
  Did the designer choose the right components?
  assume there are 20 collections and 3 ways to search

  LIBSYS: Search

  Choose collection: All
  Word or phrase:
  Search by: Title
  Adjacent words ● Yes ○ No
  [OK] [Default] [Cancel]

UI design – multiple screens

- use a **tabbed pane** when there are many screens that the user may want to switch between at any moment
- use **dialog boxes** or **option panes** to present temporary screens or options

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Creating a paper prototype

- gather materials
  - paper, pencils/pens
  - tape, scissors
  - highlighters, transparencies

- identify the screens in your UI
  - consider use cases, inputs and outputs to user

- think about how to get from one screen to next
 - this will help choose between tabs, dialogs, etc.

Application backgrounds

- draw the app background (parts that matter for the prototyping) on its own, then lay the various subscreens on top of it
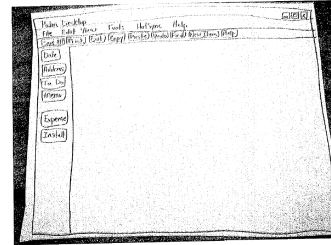
Representing interactive widgets

- buttons / check boxes: tape
- tabs, dialog boxes: index cards
- text fields: removable tape
- combo boxes: put the choices on a separate piece of paper that pops up when they click
- selections: a highlighted piece of tape or transparency
- disabled widgets: make a gray version that can sit on top of the normal enabled version

- computer beeps: say "beep"
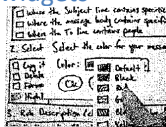
Example paper prototype screen
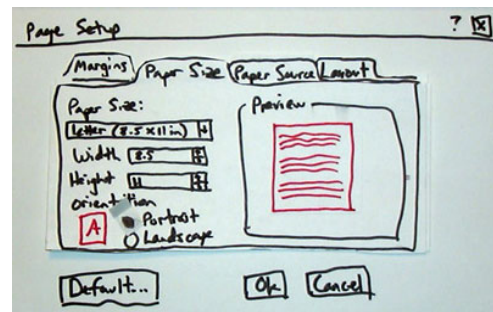
Let's talk about presentations

- Practice, practice, practice

How to give a good presentation

- Practice with your team
- Practice with people outside your team
  - Your audience won't be our teammates who've been working on the project nonstop
- Aim your presentation at the right audience
- If you had never heard about the product, what kinds of things do you need to hear?

Audience

- Who is your audience?

Your customer is your audience.

- Before you begin:
  - List the things you want to convey to your customer
  - Figure out the most effective way to convey them
  - Structure the presentation around that

PRACTICE!

Prototyping exercise

- In your project groups, draw a rough prototype for a music player (e.g., WinAmp or iTunes).
  - Assume that the program lets you store, organize, and play songs and music videos.
  - Draw the main player UI and whatever widgets are required to do a **search for a song or video**.
  - After the prototypes are done, we'll try walking through each UI together.

- Things to think about:
  - How many clicks are needed? What controls to use?
  - Could your parents figure it out without guidance?

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