CISC 1600
Introduction to Multi-Media Computing

• Course Structure
• About your Instructors
• Introduction to the Course
• What is multi-media computing?
• Introduction to user interface design
About Your Instructors

Instructor: Matthew Meyer
• 6 years of industry experience.
• NSF Fellow

Guest Lecturer(s):
• May join us if appropriate.

Course Architect: Prof Elizabeth Sklar
• 10 years of industry experience.
• Director of multimedia computing (MMC) program
Introduction to the Course

- Broad introduction to topics in Multi-Media Computing (MMC), including: web design, game design, data visualization, simulation and animation.

- Discussions about a broad range of subjects, such as: multimedia hardware and software; interface design; multi-media input devices; multi-media output; agent-based programming; uses of multi-media in industry

- Emphasis on design and creation including: web pages with cascading style sheets; interactive, graphical web-based programs; simple computer games and narratives

- Format consists of a mixture of lecture and laboratory class sessions in four distinct units:
  1. Introduction to Web Programming and Web Design
  2. Interactive Programming and Graphics
  3. Agent-based Programming, Simulations
  4. Game Programming and Narrative
Course Structure

• 4 units (each unit composed of): 2-3 lectures, 3-5 labs and 1 project

• Labs are hands-on sessions using or workstations in the multi-media lab (5301N).

• Projects will consist of:
  o computer-based component
  o written/descriptive component
  o (sometimes) oral component

• Grade = 4 projects (12.5% each) + midterm (10%) + final (30%) + Attendance/Participation (10%) = 100%
What is MMC (multi-media computing)?

• It's easier to explain what multi-media computing is not.

• Early computers were programmed by flipping switches, inserting punch-cards and using other primitive input devices.

• Early computers were likewise constrained in their output, either using lights, printers or simple text displays.

• Such limited functionality led to the infamous quote:
  "I think there is a world market for about five computers."
  - Tom Watson, then IBM chairman, 1958
What is MMC (continued)?

- Modern computers support thousands of different input and device types (Optical scanners, 3D displays, Brain-Wave controllers).

- Information storage is no longer limited purely to text files and documents.

- The richness of these new technologies have created a new paradigm for computing. Computers have gone beyond being glorified calculators to mass mediums of information distribution.
What is MMC (formally)?

- MMC represents a fusion of multiple types of data sources used to acquire, process, transmit, store, and utilize information.
- MMC takes computing and communication beyond traditional text-dominated documents and includes input and output as digital images, movies, music and animations.
- Multi-media content appears on many devices, including: laptops, cell phones, ipods.
- Multi-media collaboration requires exchange of multi-media content, stored on distributed/remote peers/servers.
- Multi-media functionality includes disseminating, broadcasting, streaming and downloading music files, movies, images, graphics and other multi-media content.
- MMC is used by diverse communities including: computing specialists, multimedia technology developers, artists, health-care providers and environmentalists.
- Information source: [http://www.sigmm.org](http://www.sigmm.org)
- Checkout the poster ...
iPad
Microsoft Surface
Introduction to User Interface Design
Introduction to User Interface Design

- 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
Perceive “action possibilities”?
What actions does the user perceive are enabled?

“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:
1. If the desired controls can be perceived.
   o In an easy-to-use design, if they can both readily be perceived and interpreted.
2. If the desired actions can be discovered.
   o 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;
  o e.g., starting a car requires a key.

• Design for error
  1. Expect that the user will make errors
  2. Figure out what those errors might be
  3. Plan for these errors:
     ▪ Eliminate them if you can.
     ▪ Otherwise plan to handle them!
Eight Rules of Interface Design *

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

* Source: Andrew Johnson (2006): http://www.evl.uic.edu/aej/422/
Recommendations

Real estate:
• How much space do you have?
• How much space will things take up?
• Where will the user have the controls?
  o On the screen and in the real world.
• Where will they want to move the controls?
  o 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)
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
  o Use the “squint” test to see if things you want to stand out, do stand out
  o Don’t make the eye wander all over back and forth across the screen)

• Use “negative space” or “white space”
  o 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
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
To Do

Check out the class web page:
http://www.sci.brooklyn.cuny.edu/~meyer/CISC1600/

Complete 1st homework assignment
Have a nice day.