CS 350: Computer/Human Interaction
Lecture 12 Overview

- Information design
- Gulf of Evaluation
  - Perception
  - Interpretation
  - Making Sense

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Stages of Action in HCI

- Information Design: Gulf of Evaluation – how users understand tasks
  - Perception
  - Interpretation
  - Making sense
- Interaction Design: Gulf of Execution – how systems support user’s task goals
  - System goal
  - Action plan
  - Execution

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Information Design

- Design interface to get from perception to making sense as quickly as possible
- Example
  - Perception – lines, color, shading, spatial organization
  - Interpretation – Excel worksheet, cell, formula
  - Making sense – budget worksheet, grade book sheets

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Perception

- Mind organizes and encodes the data it is given into groups
- Generally, no conscious thought involved
- Gestalt (German for “whole”) principles describe how information is grouped, what is related to each other, what is foreground or background

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Gestalt Principles

- Proximity – elements close together tend to be grouped together.
- Similarity – elements with shared visual characteristics tend to be grouped together
- Closure – tend to organize elements into closed groups
- Area – tend to organize elements to form smallest group
- Symmetry – tend to group symmetric elements
- Continuity – tend to organize elements into repeating patterns
Perception Example

- Border and Shading dialog box in Word
- See an immediate sense of organization
- Also see individual control elements
- “Squint test” - close one eye and squint with the other. Is the organization of display apparent?

Tradeoffs

- Want to display all possible active tasks to understand what is possible, but each display element adds complexity
- Contrasting cues highlight and group elements, but more distinctions will make each one less noticeable
- Elegant designs exploit position, thematic repetition, low-key color schemes and white space. i.e., not at all like the PPP examples...

Interpretation

- Result of perceptual encoding is recognition of the task being performed
- Mixture of bottom-up and top-down processing by user
- Need to anticipate and support users’ reactions to interface elements to speed up process. Leverage familiarity, realism, and affordance

Familiarity

- Use common vocabulary, even if not precise as to what task is taking place. Example: “display” vs. “render”; documents are organized into “folders”, not “boxes” or “directories”
- Caution: some words are ambiguous. Example: enter, check, update, view
- Consider audience. Example: adult vs. child, other cultures

Realism

- Realistic images increase recognition and long-term memory
- But often are more complex, slower to load, and suggest specific instances rather than concepts

Affordance

- Affordance is when characteristics of an object make it obvious how it is used.
- Common in real world. Examples: door knob, steering wheel.
- Examples in HCI: scrollbars, window handles
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Making Sense

- User **integrate** information to make sense of their perceived and interpreted information
- Connect new information to
  - Personal knowledge
  - Domain expertise
  - Recent events

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Consistency

- Visual design program allows users to create and benefit from expectations
  - Example: fonts, labeling
- Placement of elements
  - Example: window buttons

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Visual Metaphor

- Consistency with real world objects and actions
- Designers explore and are inspired by real world
- Allows users to recognize task easily
- Tradeoff: Metaphor can be too literal
  - Example: Desktop calculator in Figure 4.7; irrelevant information/actions

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Information Model

- **Information model** is a set of concepts, relationships and representations to facilitate understanding of large amounts of data and complex functionality
- Most common is **hierarchy** (i.e., tree model)
  - Example: library classification, Web site maps

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Making Sense

- Users detect patterns and relationships in presented information and relate them to patterns of knowledge and of the task
- Various techniques facilitate users’ making sense of user interface
  - Consistency
  - Visual metaphors
  - Information models
  - Dynamic displays

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Consistency

- Terminology, command language
  - Example: "Move backward", "Backward", "Reverse"
  - Infer: "Move forward", "Forward", "Forward"
- Internal (within screen) and external (across screens)
- See: www.gui-bloopers.com
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Information Model

- Tradeoffs: Breadth vs. depth, organization vs. inflexibility, exposing intermediate categories
- Network models common on web

Dynamic Displays

- Redisplay or animate information based on context
- Humans are good at making sense of motion and depth variations
- **Fish-eye view**: clearer, more detail at the point of interest
- Generalized to **focus+context** visualization (Figure 4.9)

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Dynamic Displays

- Semantic filtering: use semantic attributes to determine whether to display, color and shape, etc.
- Multiple coordinated views: panel of windows that show different, related views of information
  - Example: Visual Studio IDE, Java API documentation website

In-class Exercise

- Exercise 1 on page 156 of textbook:
- Use the Gulf of Evaluation to analyze the information that you process when you check your email for the first time each day. What happens during perception? Interpretation? Making sense?