Sketching and Storyboarding

CS160: User Interfaces
Maneesh Agrawala and Jeffrey Nichols
• Too many tabs – take up lots of screen space
• Tab layout reorganized every time user clicks on one
• Unclear if OK corresponds to single tab or to whole dialog
- Many tabs are hidden
- Have to scroll through to see all tabs
• Can fit in many more options vertically
• Layout never changes (selecting one does not affect others)

Review: Structure & Design

Formal Elements
– Players
– Objectives
– Procedures
– Rules
– Resources
– Conflict
– Boundaries
– Outcome

Engaging Elements
– Challenge
– Play
– Premise
– Character
– Story

What is the difference between procedures and rules?
Review: Games Benefiting Players

How else could games benefit players?

Review: Games Solving Problems

What are examples in each category?
Think of a new game design in each category
Due Today (before class)

Individual Project Proposal

Project Groups (email by EOD)

Groups of 4
– You can choose your group
– Need to decide today
– Send email by end of day - today

Send email to cs160@imail.eecs.berkeley.edu
– One email per group
– List other group members
– If your group is 1, 2 or 3 people we will build groups for you

Each person must appear in some email by the end of the day or we will assign you ourselves
Project Assignment (due Feb 9)

Group Brainstorm
– Goal: Brainstorm and refine project ideas with small group
– Will have time in class (next time)
  You may also need to meet outside class to finish the assignment

Next class (meet in Wozniak Lounge)
– Bring printouts of your Individual Project Proposal
– Brainstorm together

Design Assignemnt (due Feb 9)

Design Photocopier Touchscreen: 10 pts
– 5”x3” window
– Functions
  • Start/Stop Copying
  • Quantity of copies to make (0-100)
  • Light/Dark setting (7 levels)
  • Multiple paper sizes for input and output (Letter, Legal, Tabloid)
  • Automatic scaling when copying between different page sizes (on/off)
  • Manual scaling (25%-400%)  
  • 2-sided copying (1->1, 1->2, 2->1, 2->2)
  • Image repeat
– Produce at least 3 sketches showing alternate designs
  • Describe advantages/disadvantages of each
  • Should be hand-drawn - Scale them to be easy to read in wiki
– Due before class on Mon online, bring printout to Section
Sections
How can we reduce to 2 sections?
W 1-2pm
W 2-3pm
Th 1-2pm

Topics
• Affordances
• Depicting Processes
• Storyboarding
• Sketching (Lora Oehlberg)
Affordances

“... the term affordance refers to the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used.

Some affordances obvious
- Knobs afford turning
- Buttons afford pushing
- Glass can be seen through

Some affordances learned
- Glass breaks easily
- Floppy disk
  - Rectangular – can't insert sideways
  - Tabs prevent backwards insertion

The Design of Everyday Things. 1988. Don Norman
Door Handles

Affordances suggest how to use the object
Dependencies

Affordances suggest how to use the object

Can be dependent on the
  – Experience
  – Knowledge
  – Culture

Cultural Dependencies

Affordances suggest how to use the object

Can be dependent on the
  – Experience
  – Knowledge
  – Culture
    • Switches (US down=off, UK down=on)
    • red = danger, green = go

Can make an action easy/difficult
Perceived Affordances

Affordances suggest how to use the object

Can be dependent on the
- Experience
- Knowledge
- Culture of the actor

Can make an action easy/difficult

Affordances may be perceived without actually existing

Screen-Based Interfaces

Physical affordances
- Screen, pointing device, physical buttons, keyboard
- These afford touching, pointing, clicking on every pixel
Screen-Based Interfaces

Physical affordances
- Screen, pointing device, physical buttons, keyboard
- These afford touching, pointing, clicking on every pixel

Physical affordances of screens often unused
- Screen affords touching, but most screens are not touch sensitive

Game Controller Affordances
Game Controller Affordances

Wii remote, roughly flashlight sized, easy to grip the right way.

Roughly the diameter of a tennis racket/baseball bat/golf club

“Trigger” button underneath falls under the index finger.

Most-used buttons are thumb- or index-finger operated.

Game Controller Affordances

But the Wii remote also supports two-handed use.

In this position, the main select “A” button falls under the left hand. The right hand button replaces it.

Main select doesn’t work in older Nintendo games. This takes some getting used to…
Designer Controls Perceived Affordances

What are the affordances of these graphical objects?

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Do Graphical Objects Afford Clicking?

What are the affordances of these objects?
Do Graphical Objects Afford Clicking?

- Graphic design emphasizes affordances
- Does user recognize object as a button to be clicked?
**Widget Affordances**

Well-designed widgets have clear affordances

e.g. resize handles:

![Resize Handle](image)

crop handles:

![Crop Handle](image)

motion arrows

![Motion Arrow](image)

**Depicting Processes**
What is a Process?

Process: A series of actions or operations conducing to an end
- Series ➔ Time
- End ➔ Goal
Lego Assembly Instructions

Putting on a tie
Creating the Narrative

Process: A series of actions or operations conducing to an end
1. Choose the goal
2. Plan ordered set of actions to achieve goal
3. Depict each action

Breaking Goal Into Tasks/Actions

- What is unit of action?
- Sub-steps within steps

Wordless Workshop [Doty 96]
Planning

- Which actions?
- What order?

Operations required to dress
[based on Cormen et al. 90]

Depiction
Visual instructions for learning disabled

Peanut butter & Jelly Sandwich
Get 2 slices of bread.
Open peanut butter.

Spread peanut butter.
Put lid back on.
Open jelly.

Spread jelly on bread.
Put lid back on jelly.
Put together

[Orth 01]
Building a Lego Fire Truck

1. Start with 2 x 20 black piece
2. Turn over and attach 2 x 2 black piece flush with left side. Attach another 2 x 2 black piece 2 studs in from the right side.
3. Turn right side up and attach 1 x 4 red piece ...

Words and Images

Words
- Labeling / Annotation
- Verbs (actions)
- Adverbs, Some adjectives
- Abstract concepts

Images (Very important for interface design)
- Visual / physical properties
- Spatial relationships
- Actions indicated by diagrammatic conventions

- Images allow for graphic conversations (QC514A.mov)
- Loose diagrams are especially useful early on (QC515A.mov)
Storyboarding
In Interface Design

Troops

See http://www.theforce.net/theater/shortfilms/troops/
Storyboarding for Interfaces

Technique
– Series of frames depicting key steps in reaching a goal
  • Can use a pin board for easy rearrangement/editing

– Describe the interaction in context
  • Often useful to show user in at least 1st frame (establishing shot)
  • Relationship between the user and its environment
  • Relationship between the user and the system

Sketch: Single Display
Sketch: Single Display

Film Editing Interface

Storyboards: Multiple Frames

SCENARIO 1: "I want to listen to alternative music"
Storyboards: Multiple Frames

From SIMS 202
Test Storyboards with Users

Can be “played” in front of users (or other designers)

Check understanding of process users go through
- Observe user reaction
- Debrief users

Good reference point during the design process

Next Time

In Class Group Brainstorm
Bring another printout of your Individual Project Proposal

Reading

This is a classic HCI paper, but quite dense. Focus on understanding Fig 6.