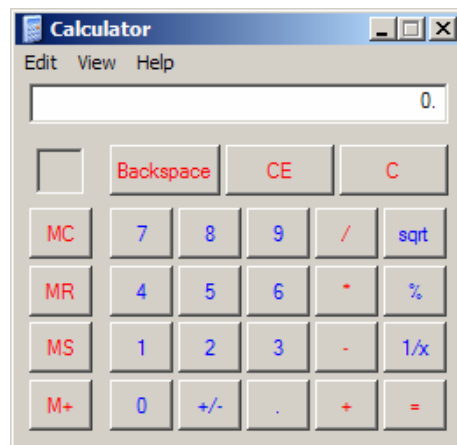
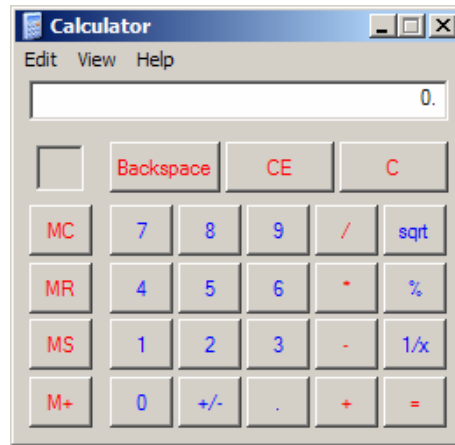


# Low-Fidelity Prototyping

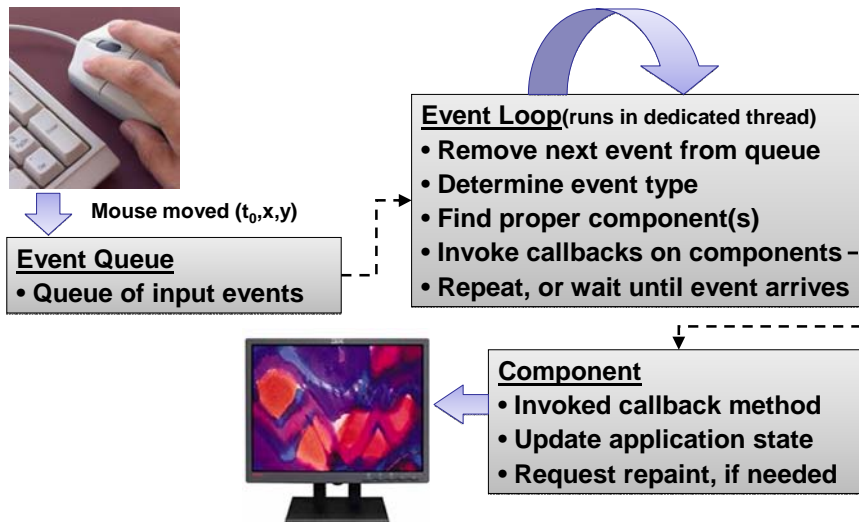
CSI 60: User Interfaces  
Maneesh Agrawala





- Unlabeled button-like thing
- Uses familiar calculator metaphor (Takes it too far??)
  - Cryptic labels (CE vs. C) (M+, MS, MR, MS → why not show what is in memory)
  - Single line of display text
- Can use keypad but affordance is not visible

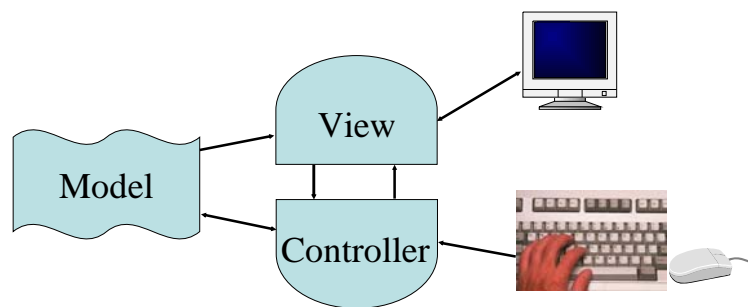
## Review: Event Dispatch Loop



## Review: Model-View-Controller

Architecture for interactive apps

- Model: Info the application manipulates
- View: Visual display of the model
- Controller: Receives input & decides what they do



## Review: Storyboarding

Series of key 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 1<sup>st</sup> frame (establishing shot)



## Assignment (Due Feb. 26)

- Android Intro Application
  - Build a simple application for searching and browsing Flickr photos using Android
  - **Individual assignment**
  - Requires significant work – get started early
- Emphasis on:
  - Designing a UI for searching / browsing
  - Creating appropriate Activity & Intent objects
  - Handling Activity lifecycle

## Topics

- Creating the prototype
- Wizard of Oz prototype testing

## Creating the Prototype

### Why Do We Prototype?

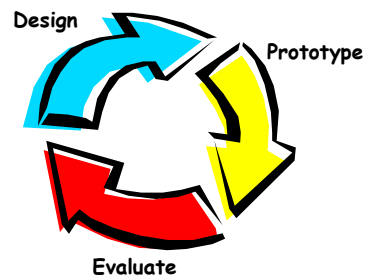
Get feedback on our design faster

– saves money

Experiment with alternative designs

Fix problems before code is written

Keep the design centered on the user



# Fidelity in Prototyping

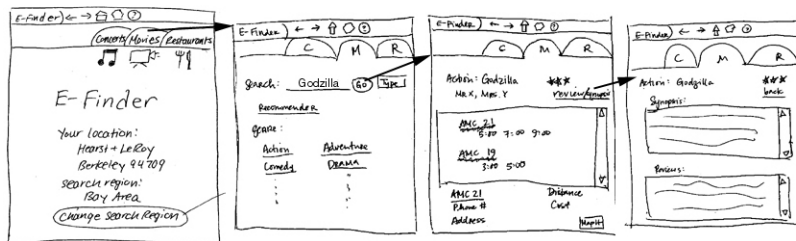
Fidelity refers to the level of detail

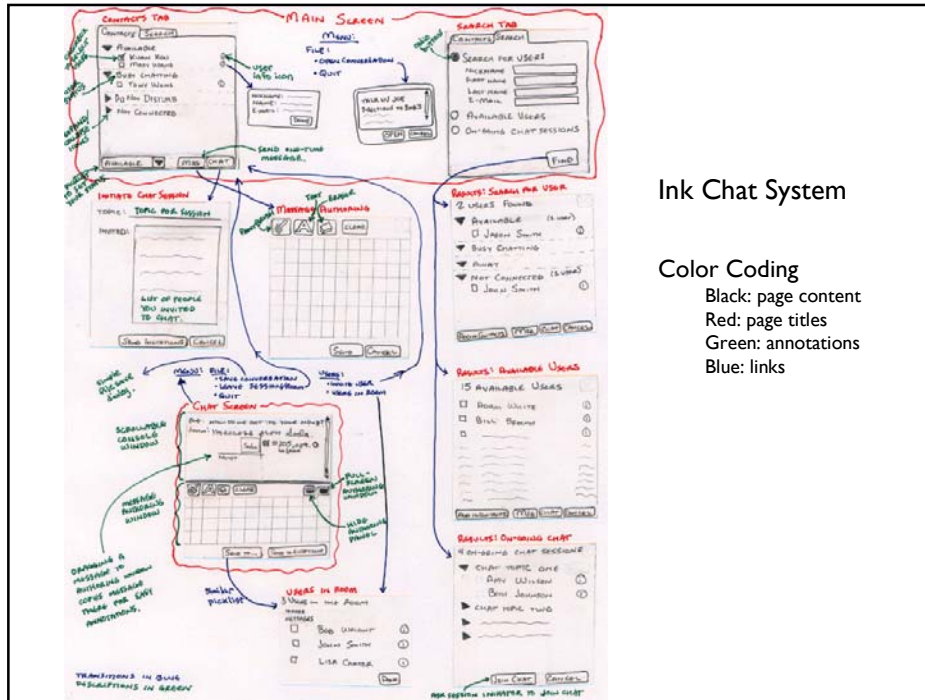
High fidelity,

- Prototypes look like the final product

Low fidelity,

- Artists renditions with many details missing





### Ink Chat System

- Color Coding**
- Black: page content
  - Red: page titles
  - Green: annotations
  - Blue: links

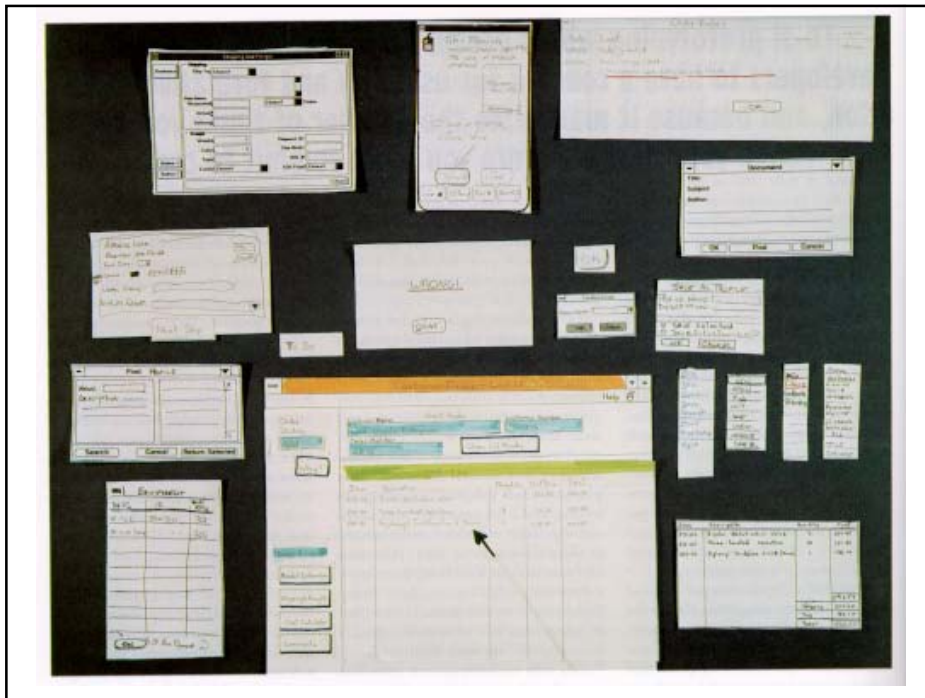
## Hi-Fi Disadvantages

- Distort perceptions of the tester
  - Formal representation indicates “finished” nature
  - People comment on color, fonts, and alignment
- Discourages major changes
  - Testers don’t want to change a “finished” design
  - Designers don’t want to lose effort put into creating hi-fi design



# Materials

- Large, heavy, white paper (11 x 17)
- 5x8 in. index cards
- Post-it notes
- Tape, stick glue, correction tape
- Pens & markers (colors & sizes)
- Transparencies (including colored)
- Colorforms (toy stores)
- Scissors, X-acto knives, etc.





- + Add a course
- Drop a course
- 🔍 Search for a course
- 👁 View Requirement
- ? Help

- ⚙ Preferences
- 🖨 Print
- 🔄 Update telebears
- 💾 Save
- 🚪 Logout

# ESP

EECS  
Schedule  
Planner

Welcome to ESP.

Your Telebears session  
is Tues. Sept. 21 @ 10am

Your current schedule  
is empty. Please click  
on Add a course to  
continue.

	Monday	Tuesday	Wednesday	Thursday	Friday
8-9					
9-10					
10-11					
11-12					
12-1					
1-2					
2-3					
3-4					
4-5					
5-6					

- + Add a course
- Drop a course
- 🔍 Search for a course
- 👁 View Requirement
- ? Help

- ⚙ Preferences
- 🖨 Print
- 🔄 Update telebears
- 💾 Save

# ESP

EECS  
Schedule  
Planner

## Add Menu

Dept

course.

transaction.

**Search** if you don't know  
the course number.

**HELP**

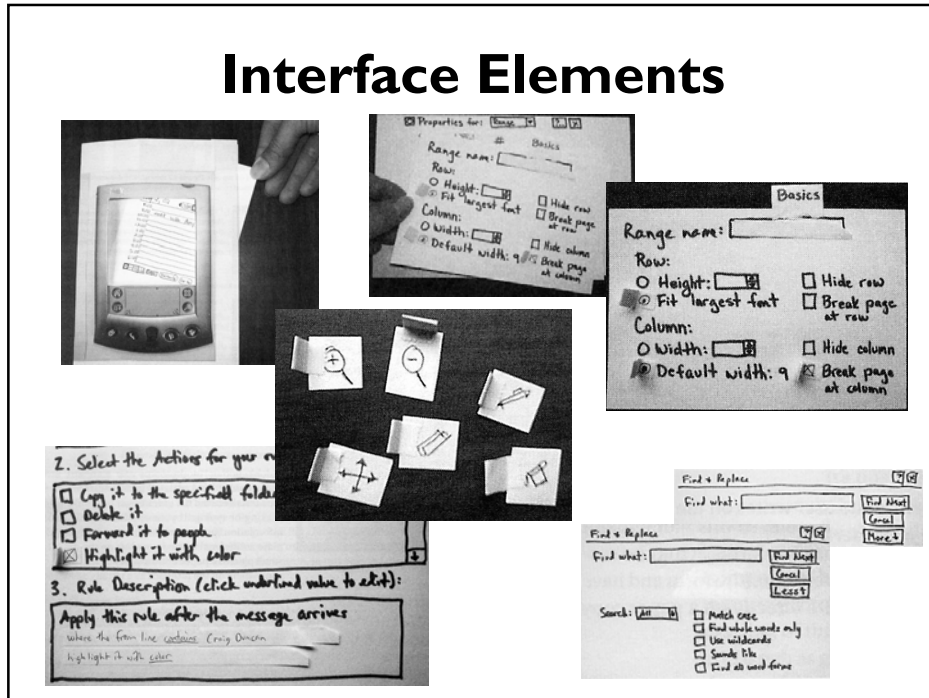
Help - Add Menu

- ▷ Select Department from drop down menu.
- ▷ Enter course numbers  
if you don't know course number, press SEARCH  
button.
- ▷ Press ADD to continue transaction.
- ▷ Click CANCEL to end transaction.

CLOSE

	Monday	Tuesday
8-9		
9-10		
10-11		
11-12		
12-1		
1-2		
2-3		
3-4		
4-5		
5-6		

# Interface Elements



## Constructing the Prototype

Set a deadline

- Don't think too long - build it!

Draw a window frame on large paper

- **Draw at a large size, but use correct aspect ratio**

Put different screen regions on cards

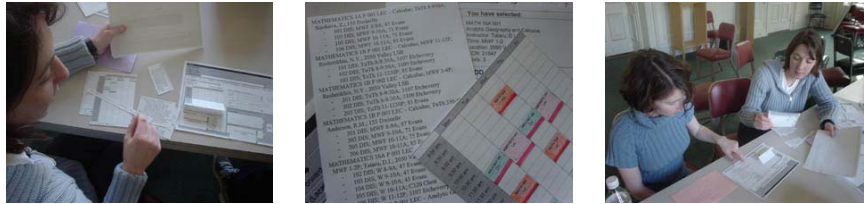
- Anything that moves, changes, appears/disappears
- Use greek-ing to indicate text if necessary *~~~~~*

Ready response for any user action

- e.g., Have those pull-down menus already made

Use photocopier to make many versions

# Wizard of Oz Prototype Testing



SIMS 213 Project: Telebears redesign

## Preparing for a Test

### Select your participants

- Understand background of intended users
- Use a questionnaire to get the people you need
- Don't use friends or family

### Prepare scenarios that are

- Typical of the product during actual use
- Make prototype support these (small, yet broad)

### Practice running the computer to avoid “bugs”

- You need every menu and dialog for the tasks
- All widgets the user might press
  - Remember “help” and “cancel” buttons

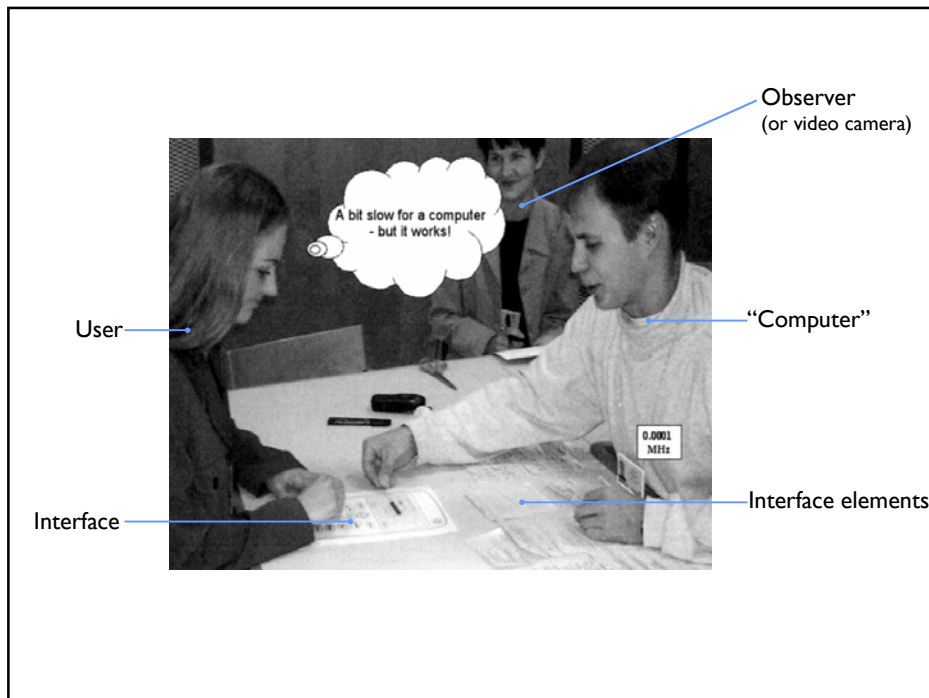
# Conducting a Test

Three or Four testers (preferable)

- **Greeter** - Puts users at ease & gets data
- **Facilitator** - only team member who speaks
  - Gives instructions & encourages thoughts, opinions
- **Computer** - knows application logic & controls it
  - Always simulates the response, w/o explanation
- **Observer(s)** - Take notes & recommendations

Typical session should be approximately 1 hour

- Preparation, the test, debriefing



## Conducting a Test (cont.)

### Greet

- Get forms filled, assure confidentiality, etc.

### Test

- Facilitator explains how test will work
  - Performs a simple task
- Facilitator hands written tasks to the user
  - Must be clear & detailed
- Facilitator keeps getting “output” from participant
  - “What are you thinking right now?”, “Think aloud”
- Observers record what happens
  - Avoid strong reactions:, frowning, laughing, impatience – biases the test
- **Designers should not lead participants**
  - Let users figure things out themselves as much as possible
  - Only answer questions if user remains stuck for a long time

## Conducting a Test (cont.)

### Debrief

- Fill out post-evaluation questionnaire
- Ask questions about parts you saw problems on
- Gather impressions
- Give thanks

## Wizard of Oz Tips

Rehearse your actions

- For a complicated UI, make a flowchart which is hidden from the user
- Make list of legal words for a speech interface

Stay “in role”

- You are a computer, and have no common sense, or ability to understand spoken English.

Facilitator can remind user of the rules if the user gets stuck

## Think Aloud

Explain how to “think aloud.”

- Explain why you want participants to think aloud, and demonstrate how to do it. E.g.:
- We have found that we get a great deal of information from these informal tests if we ask people to think aloud. Would you like me to demonstrate?



## Evaluating Results

Sort & prioritize observations

- What was important?
- Lots of problems in the same area?

Create a written report on findings

- Gives agenda for meeting on design changes

Make changes & iterate

## Advantages of Low-Fi Prototyping

Takes only a few hours

- No expensive equipment needed

Can test multiple alternatives

- Fast iterations
  - Number of iterations is tied to final quality

Can change the design as you test

- If users are trying to use the interface in a way you didn't design it – go with what they think! Adapt!

Especially useful for hard to implement features

- Speech and handwriting recognition

## Drawbacks of Lo-Fi Prototyping

Evolving the prototype requires redrawing  
– Can be slow (but reprogramming usually slower)

Lack support for “design memory”

Force manual translation to electronic format

Do not allow real-time end-user interaction

## Caveats

There is a down-side to the informal design approach:

Often hard to involve **paying** clients as subjects – they treat the fidelity of the interface as a sign of development effort

Mitigators: involve them early and often, correspond with the same people, explain the process up front (set expectations)



## Exercise

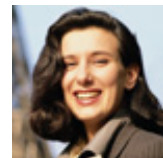
### Airport “wayfinder” for travelers

**Problem statement:**

*When passing through airports, people often have difficulty finding the services they need. The availability of these services, as well as how to get to them, is not obvious, which can result in missed flights, weary travelers, and a stressful customer experience.*

**Target persona: Angela, ~31, business traveler**

- Wants to travel without hassle
- 30 minute layover in unfamiliar airport
- What might she want to do in this time?
- What kind of interface would support her tasks?



## Constraints

- PDA/Smart phone class hardware
- Wireless infrastructure available
- Low resolution location information available



## Exercise

Work with your project group

### Your tasks

- Brainstorm about Angela's goals
  - What does she want to do at the airport
  - What information does she need
  - What kind of interface will support her tasks
- Create an initial low fidelity prototype
- Debug the interface with users from another group
  - Does the interface meet Angela's needs?
  - Is the interface hassle-free?
  - Is the interface confusing or difficult?

## Summary

Informal prototypes allow you to design (and test!) before writing code.

Rapid evolution and elimination of many problems happens in this phase.

Paper+ink is the traditional tool

## Next Time

### Human Information Processing (Perception)

- [The Model Human Processor](#). *The Psychology of Human-Computer Interaction*. Chap 2. Card, Moran & Newell