Early Stage User Interface Design

- Brainstorming
  - put designs in a tangible form
- Incomplete designs
  - illustrate important examples
- Sketching & other informal representations important

1) lateral thinking
2) Unlike designing a computer program, you do not need to consider all cases this early.
3) present several designs to give the client an idea of what the designer is thinking about.
Informal vs. Formal Representations

- Informal visual representation
  - communicates “unfinished”
  - encourages creativity
  - faster to create

- Formal visual representation
  - communicates “finished”
  - inhibits creativity (detailing)
  - slower to create

1) Formal: *rigid and unambiguous*
- can’t easily add a rough drawing / animation to PP slides
- “sketches” in drawing program have straight lines & unambiguous obj's
- must fit in the format of the system at a more formal level than we may wish to communicate

3) Warp
   specifying details takes more time
   tunnel vision

Supported by work by Black, Goel, & Gross
Informal User Interfaces

- Take advantage of natural input modalities
  - speaking
  - writing
  - gesturing
  - sketching

- Minimize recognition of the input
  - allow users to work & communicate naturally
  - document rather than transform

**Informal Us do this without translating** the original input to a rigid format & hopefully lead to a more natural communication of our artifacts. Unrecognized input suggests a malleability of form that is critical for activities such as early-stage design.
Investigation into Web Design: Information Architecture Comes First

- Interviews w/ 11 professional designers
- Post-Its & large surfaces (i.e., affinity diagrams)
  + haptic UI
  + brainstorming
  + collaborative
  + persistent
  + immersive
- hard to share, edit, make digital

Our group works by talking to real designers
artifacts were collected and analyzed
focus on specific projects & artifacts
Designers were
  from 5 different companies
    portals, design firms, consultants
  representative of different specialties
Investigation into Web Design: Multiple Views

- Designers create representations of sites at *multiple levels of detail*
- Web sites are iteratively refined at all levels of detail

**Site Maps** -- High-level, coarse-grained view of entire site

**Storyboards** -- Interaction sequence, minimal page level detail

**Schematics & Mockups** represent individual pages

We saw similar things with our earlier studies of GUI designers
Sketching: during early phases. To explore design space before committing ideas to a more formal rep

Reasons for sketching

“work through” ideas & explore design space
face-to-face collaborative situations
“fun”

Sketching less than they wanted to

“professionalism”: need to present ideas formally

ease of incremental modification

“All designers sketched ... at all levels”
SUEDE:
Informal Prototyping for Speech-based UIs

- Supports design practice
  - example scripts
  - Wizard of Oz
  - error simulation
  - iterative design (design-test-analysis)
- Informal user interface
  - no speech recognition or synthesis
  - need not be programming expert
  - fast & fluid design

A GUI for the designer to design a speech-based prototype...
Hello, what is your name? name
What would you like to do? Hang up

Hello, what is your name? name
What would you like to do? read email
Video

SUEDE Video [~2 minutes]

Start from the middle of the RAM file...
SUEDE Summary

- SUEDE supports speech-based UI design
  - moving from concrete examples to abstractions
  - embeds iterative design
  - informal interface supports fast & fluid design
  - designers need not be speech technology experts
- Status
  - downloaded over 1000 times (as of 2002)
  - used by several companies for designing telephone-based speech UIs

supports existing SUI design practices

important as we move towards a range of new devices that would be hard for all designers to be intimately familiar with

we want our multimodal UI design tools to have similar characteristics
Design Patterns

- Design is about finding solutions
  - unfortunately, designers often reinvent
    - hard to know how things were done before & to reuse solutions
  - design patterns allow designers to reuse what works well
- First used in architecture [Alexander]
- Communicate design problems & solutions
  - how to create a beer garden where people socialize...
  - how big doors should be & where...
  - how to use handles...
- Not too general & not too specific
  - use solution “a million times over, without ever doing it the same way twice”

Christopher Alexander described patterns for design in architecture... his pattern language contained several hundred patterns split into three categories--towns, buildings and construction.
Web Design Patterns

- Communicate design problems & solutions
  - how to make e-commerce sites where people return & buy...
  - how to create a shopping cart that supports check out...
  - how to create navigation bars for finding relevant content...
Pattern Solution

- Captures essence on how to solve problem
- Navigation bar
  - First-level navigation
  - Second-level navigation
- Generality of solution fits informal approach!
Other Tools

- Demais (multimedia)
- DART (augmented reality)
Summary

- Iterative design is the key to good UIs
- Informal tools are the key to iterative design
- Berkeley built several tools to support
  - Web Design (Outpost & Denim)
  - Speech UI Design (Suede)
  - Multimodal, Cross device UI Design (CrossWeaver & Damask)
- Positive results from evaluations & community reaction
DENIM Questions

- A comparative study?
- Sufficiently low threshold?
- Sufficiently high ceiling?
- Should designs be thrown over the wall, as DENIM advocates?
Next Time...
Integrating Physical & Digital

Haptic Techniques for Media Control, Scott S. Snibbe, Karon E. MacLean, Rob Shaw, Jayne Roderick, William L. Verplank, Mark Scheef

Much of this material is based on James Landay’s 2002 research overview talk

now over to <today’s speaker>