Final Review

490F

What's on the Final?
- Everything
- Lecture Slides
- Assignments/Project
- Readings
- Discussion Section
- Worth 25%
- Bias toward topics covered after midterm

What is HCI?

Technology => Design => Tasks

Organizational & Social Issues => Humans

Iteration at Every Stage

Goals of the course

1) Learn to design, prototype, & evaluate UIs
   - the needs & tasks of prospective users
   - cognitive/perceptual constraints that affect design
   - technology & techniques used to prototype UIs
   - techniques for evaluating a user interface design
   - importance of iterative design for usability
   - technology used to prototype & implement UI code
   - how to work together on a team project
   - communicate your results to a group
     - key to your future success

2) Understand where technology is going & what UIs of the future might be like
Intro, Design Discovery
- Intro
  - Design triangle
  - Usability Metrics
- Task Analysis
  - Questions ***
  - Tasks
- Contextual Inquiry
  - Context, Apprentice Model

Task Analysis
1. Who is going to use the system?
2. What tasks do they now perform?
3. What tasks are desired?
4. How are the tasks learned?
5. Where are the tasks performed?
6. What's the relationship between user & data?
7. What other tools does the user have?
8. How do users communicate with each other?
9. How often are the tasks performed?
10. What are the time constraints on the tasks?
11. What happens when things go wrong?

Conceptual Models & Interface
- Metaphors
  - Design Concepts
    - Affordances
    - Conceptual Models (Design, Customer)
  - Visibility
  - Metaphors
  - Consistency

Human Abilities
- Human Perception
  - Color sensitivity & physical human eye
  - Hue, Lightness, Saturation
- Model Human Processor
  - Fitt’s law
  - LTM, STM
  - 100ms

Lo-Fi Prototyping
- Lo-fi Prototyping Advantages
  - Speed
  - Cost
  - Quickly iterate
  - Focus on interaction rather than details
- Conducting a test
- Wizard of Oz
- Informal prototyping tools

Heuristic Evaluation
- Pros
  - Fast + Cheap
  - Gets major problems
- Cons
  - Not as in depth as User Testing
  - False Positives
  - Need trained evaluators
- Phases
  - Training, Evaluation (x2), Severity Rating, Debriefing
  - Diminishing returns when adding evaluators (sweet spot 3-5)
  - Have evaluators independently rate severity
  - Alternate with user testing
Heuristic Evaluation

1. Visibility of system status
2. Match between system and the real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use
8. Aesthetic and minimalist design
9. Help users recognize, diagnose, and recover from errors
10. Help and documentation

Design Patterns

- Design patterns communicate common design problems and solutions
- Prevent "reinvention"
- Not too general & not too specific
  - Use a solution "a million times over, without ever doing it the same way twice"
- Web Design Patterns
  - Above the Fold
  - Shopping Cart
  - Location Bread Crumbs
  - Up-selling/Cross-selling
  - Visibility Action Button
  - ...

Rapid Prototyping

- Difference from Lo-Fi?
  - Problems with Lo-Fi?
    - Computer "buggy"
    - Timings
    - Affordances/Doesn’t look like final version
    - Unrealistic / Hard to recognize widgets
    - Not in context of user’s work
    - Some things hard to simulate (dragging/highlights)
- Advantages of Prototyping Tools?
  - Faster than code

Advanced User Testing

- User testing is important
  - Don’t know how good a UI is until... people use it
  - Why?
    - Evaluators may know too much or too little
    - Hard to predict what people will do
- User testing takes time & effort
  - Problems finding representative users
  - Early testing can be done on low-fi mock-ups
    - real tasks & representative participants
  - Be ethical & treat your participants well

Advanced User Testing (cont)

- Process Data vs Bottom Line Data?
- Process Data
  - Observations of what users are doing & thinking
  - Thinking aloud
  - Critical incidents
- Bottom Line Data
  - Summary of what happened (time, errors, success)
  - i.e., the dependent variables
  - Requires more participants to get statistically reliable results
  - Dependant vs independent variables?
  - Between Groups vs Within Groups?
    - Between groups: everyone participates in one condition
    - Within groups: everyone participates
  - Potential Question
    - Here is an example of a user test: Where are the flaws?
From Discussion
- Speech UI's
  - Motivation
  - Why they're hard
  - Speech Recognition / Production
- Errors
  - Types of Error
  - Strategies
- CSCW
  - CSCW vs HCI
  - Dimensions of Cooperation
  - Coordination, Cooperation, Communication
- Design

Visual Design
- Typography
- Grid Systems
- Small Multiples
- Color Spaces
  - RGB vs. HSV (a.k.a. HLS)
  - Use color properly – not for ordering!

Visual Design
- How do Serif fonts help the reader?
  - Serifs lead your eye along the line
- Grids help clarify & simply visual design by?
  - reducing visual clutter
  - improving consistency between items
  - put things where people expect
- How do small multiples enable us to notice differences?
  - only make changes (e.g., in color) for differences that matter
- How can color be problematic online?
  - device may not be able to display color
  - presentation is different on different devices (calibration)
  - using color values for continuous scales (ok to use brightness)

From Assignment
- Be familiar with:
  - Contextual Inquiry
  - Task Analysis
  - Low Fidelity Prototyping
  - Heuristic Evaluation
  - Hall of Fame/Shame
  - Usability Testing

Good Luck!
- Questions?

More Details
History of HCI
- Vannevar Bush
- As we may think: Predictions?
- Doug Englebart
  - Inventions?
- Noun-Verb, Verb-Noun
- Augmenting human intellect

A Quick Topics List
- Know thy user & involve them in design
  - answer questions before designing
  - who, what, where, when, how often?
  - users & data?, other tools? when things go wrong?
- Selecting tasks
  - real tasks with reasonable functionality coverage
  - complete, specific tasks of what user wants to do
- Contextual inquiry
  - way to answer the task analysis questions
  - interview & observe real users
  - use the master-apprentice model to get them to teach you

Conceptual Models & Interface
- Metaphors
  - Conceptual Model
    - Mental representation of how object works & how interface controls affect it
    - Mismatch?
  - Affordances as Perceptual Clues
  - Well-designed objects have affordances
  - Metaphors
  - Consistency
  - Design Guidelines
    - Provide good conceptual model
    - Map interface controls to user’s model
    - Make things visible
    - Provide feedback
    - Be consistent

Web Design Patterns
- Designers create representations of sites at multiple levels of detail
- Web sites are iteratively refined at all levels of detail
  - Site Maps, Storyboards, Schematics, Mock-ups
- Patterns:
  - Site Branding
  - Personal E-Commerce
  - Sitemap
  - Above the Fold
  - Location/Background
  - Personalized Recommendations/Recommendation Continuity
  - Shopping Cart
  - Up-selling/Cross-selling
  - Visibility/Action Button
  - Quick Flow Checkout
  - New account
  - Process Funnel
  - Order Summary
  - Context Sensitive Help
  - Navigation Bar
  - Meaningful Error Messages
  - Search Action Module

A Quick Topics List
- Rapid Prototyping
  - Difference from Lo-Fi?
  - Problems with Lo-Fi?
  - Advantages of Tools?