

**Introduction to Human Computer Interaction & Design**  
**Assignment #5: Low-fi Prototyping & Pilot Usability Testing**  
**Due at the start of lecture on 11/21**  
**[Assignment from Landay of Stanford CS]**

**Instructor: Hao-Hua Chu**  
**Fall Semester, 2016**

**Overview**

The goal of this assignment is to learn how to use low-fi prototyping in the early stages of UI design. You will first sketch out many different design realizations that will implement your solution. You will then select the best of these realizations to test further. You will build a low-fi prototype of this best design and then perform a simple usability test. You will incorporate the results of the test into design changes in your prototype for the next assignment.

**Project Requirements**

**1. Concept and UI Exploration: Sketches and Storyboards**

- a. *Concept Sketches:* Based on your insights from needfinding and your 3 tasks, brainstorm and draw 15-20 rough sketches of at least 3-5 different design ideas (realizations) to implement your chosen application idea. Look at a wide variety of input/output modalities (e.g., speech, wearable, etc) to explore the space. [See examples](#) of the variation & style.
  
- b. *UI Sketches:* Pick the top two yet diverse realizations from (1a) and storyboard the interface designs in more detail. The entire interface does not need to be fleshed out, but a few key "screens" should be there (e.g., 3-5 sketches for *each* of the two design ideas) as well as some transitions between them (i.e., arrows showing relationships between interaction on one screen and movement to another screen or changes in states).

These should still be rough sketches (include both designs in the final report) but you should be starting to get at more of the details necessary for your design idea. Scan in or take photographs of these UI sketches for the report (details below). [See examples.](#)

- c. *Design Selection*: Pick the best of the two design ideas for continued exploration. Please give the reasoning for your choice from field data and/or design reasoning and intuition.
  - d. *UI Storyboards*: Given your simple, moderate, and complex tasks from the previous assignment, storyboard a task flow for each task, for a total of at least three task flows, that shows (visually) *how* the tasks will be performed using your best proposed user interface from (1c). These storyboarded task flows will also show the transitions between screens (i.e., arrows showing relationships between interaction on one screen and change in states). Make sure these are self-explanatory with any additional notes annotating the storyboard to explain. Scan in or take photographs of these UI Storyboards for your report.
2. **Design and construct your low-fidelity prototype.** Use the techniques described in the Snyder chapter as a guideline. Make your low-fi prototype on paper (if you'd like to use POP or Balsamiq let your TA know in advance to ensure these tools are appropriate for your project).

Your low-fi test will use the three (3) or more tasks that you turned into UI Storyboards in (1d). These benchmark tasks should include *1 simple task, 1 moderate task, and 1 complex task*. These tasks should give good coverage of your interface.

3. **Find at least three (3) participants to work through your tasks.** You should not use friends, class members, or people who have already been exposed to your project. The type of people you use should be based on your needfinding. Remember it must be voluntary. You should get them to sign a consent form ensuring their confidentiality (see an example at <http://hci.stanford.edu/courses/cs147/2015/au/assignments/consent-form.html>).

## Testing Procedures

- **Have one of your teammates demo the system** to show the participant how they would interact with your prototype. Do not show your participants exactly how to perform your tasks. Just show how the system works in general and give an example of something specific that is different enough from your tasks.
- **You should write up a script of your demo** and follow the same script with each participant. The participant will then be given task directions for the first task that tells them what they are trying to achieve, not how to do it. When they are finished, you will give them the directions for the next task and so on. Keep each task on a separate card or sheet of paper.
- **Make a log of critical incidents** (both positive and negative events) during the experiment. For example, the user might make a mistake or they might see something they like and say, "cool." Write it down along with a description of what was going on. Later you should prioritize these events and assign severity ratings to the problems (use the ratings of 0=no problem, 1=cosmetic problem only, 2=minor usability problem, 3=major usability problem, 4=usability catastrophe).
- **Each participant will perform all 3 tasks.** Keep the data separate for each task and participant. Keep participant names confidential in your logs (use the "participant number" from the consent form in all other data).

## Deliverables

A written report and presentation slides (presented in studio) are due on Coursework before the start of your studio.

### *Report*

We require your report be **no more than 1500 words of text** (images are free--put the word count at the bottom of your report). Your report should follow the outline below and will be graded using the guidelines that follow.

1. Title, each team member's name (only last initial) & role
2. Introduction (¼ page)
  1. Mission Statement/Value Proposition
  2. Problem / Solution Overview
3. Sketches (images w/ caption)
  1. overview image of the 15-20 sketches you made

2. top two sketches storyboarded
4. Selected Interface Design (¼ page)
  1. storyboards for 3 tasks
  2. reasoning for selection
5. Prototype description, with images of each screen used by your tasks and a picture of the entire system (½ page)
6. Method (¾-1 page)
  1. Participants: demographics, how recruited/compensated
  2. Environment
  3. Tasks
  4. Procedure
  5. Test Measures
7. Results (½ page)
8. Discussion (¾ page)
9. Appendices (as many pages as necessary - link from text into the appendices)
  1. include all forms (consent forms, surveys, etc.) handed out to participants
  2. include raw data (cleaned up and readable)
  3. include any extra figures that don't fit in the body

Hint: put images inline (i.e., where they belong in the text) along with a caption and figure number.

Here are four good reports to check out from prior classes: [What's Happening](#), [TripMe](#), [TaskMan](#), and [UpLift](#) (note these will be longer since they had a higher page guideline & slightly different requirements).

### ***Report Grading Criteria***

**Mission statement / Value proposition / Problem-Solution Overview (10 pts)**

The value proposition should concisely convey what customers get out of your product in a short phrase (e.g., stripe.com "Payment infrastructure for the Internet", evernote: "Remember everything!"). Your problem/solution overview should be a concise statement of the problem you are tackling and a brief synopsis of your proposed solution.

### **Writing quality (10 pts)**

Check your essay for grammar errors and make sure it is easy to read. First and foremost this means making sure your writing is clear and concise. This also means using bolded section headings, liberally adding whitespace, having short paragraphs, and including images in the body of the write-up with appropriate figure numbers and captions. Refer to the figures (e.g., "(see Figure 2)") in the body of your text.

### **Sketches (10 pts)**

We are looking for *two different interface designs* that seem plausible, but each take a very different approach. We will be grading the quality and diversity of these ideas, as well as the execution (sketches are rough, arrows showing transitions are clear, and that there are enough screens for each to get the idea across). Include a 1-2 sentence description providing context and/or explaining the concept.

### **Selected interface design (10 pts)**

We want to have a good understanding of the interface you have chosen to detail further and your rationale for choosing it. Why did you choose it? What makes this design superior to your other design? Any reasoning from data or constraints of the target platform?

Given this idea, we need a good description of what it is. What can you do with it? This section should clearly indicate the *functionality* of your artifact (use a table to summarize this information in a clear form). Add more sketches if necessary and annotate (i.e.,

drawing an arrow to something to indicate its function) in a different color if that helps us to understand these questions.

### **UI Storyboards (10 pts)**

We want to see that you know how to turn tasks into sketched task flows by adding the details to accomplish your tasks. Task flows include the steps customers will go through to accomplish the task. Your task flows do not have to detail every little step, but they should be dependent on the design you have chosen. You will be graded on how realistic your task flows are and how well they are written to communicate how a user will accomplish the task. Annotate your sketches in a different color if that helps us to understand this better.

### **Prototype (20 pts)**

Describe your low-fi prototype. What are the main pieces of functionality? What are the key interaction ideas (i.e., are they key ways to use it? Touch input to move through visual screens? Speech input? VR?) How does the user operate it? Reference sketches of the interface screens in your description (scan them in/photograph – make sure they are readable). Finally, take one picture of the entire paper-based system with all of its elements laid out.

### **Method (15 pts)**

Describe the participants in the experiment, how they were selected, and any compensation they received. Also describe the testing environment and how the prototype and any other equipment were set up. Include images. Describe some details of your testing procedure. This should include the experimental roles of each member of the team. To prepare for the experiment, you should assign team members to the different tasks (i.e., computer, facilitator, etc.) and practice with someone playing the participant. The test measures detail what you looked for or measured during the experiment. You should concentrate on process data (i.e., what is happening in the big picture) in addition

to bottom-line data (i.e., time or # of errors).

### **Results and Discussion (15 pts)**

Summarize the results of the experiment from your process data and the discuss your the meaning of your results. What did you learn from the experiment? How will the results change the design of your interface? Was there anything that the experiment could not reveal?

## ***Presentation Guidelines***

The presentation grading will be broken into two components: the individual grade of the presenter and a group grade for the presentation of the initial UI design ideas & the study results. Note that you should use images liberally and try to keep the text on the slides brief (and use large fonts – no less than 20 pt anywhere). One member of your team who has not yet presented will make a

**9- minute presentation** in studio (with 4 additional minutes for questions). The grades for each of these components are explained in more detail below.

### **Group grade**

\_\_\_ **Selected interface design:** Why did you choose it? Any reasoning from data or constraints of the target platform? What can you do with it? (25 points)

\_\_\_ **Representative tasks & task flows.** Did they provide coverage of the functionality in the application? Was it clear on how a user carried out the task? (25 points)

\_\_\_ **Low-fi prototype:** Was the interface novel and creative? Was it appropriate for the supported tasks? Did it follow from sound reasoning? Were appropriate low-fi techniques/style used? (25 points)

\_\_\_ **Experiment:** Was the experiment carried out in a sound manner (e.g., participants, location, method)? Were the results given in sufficient detail to understand what occurred? Were the suggested UI improvements sound & follow from the results? (25 points)

### **Presenter's grades Suggested**

#### **Organization**

- Overview of talk (1 slide) – don't read this, tell it like a story
- Team mission statement/Value proposition (1 slide)
- Selected Interface & Rationale (1 slide)
- Low-fi prototype structure (1 slide – mainly images)
- 3 tasks & task flows shown carrying out each task w/ low-fi (1 slide + animation/task)
- Experimental method (1 slide)
- Experimental results (1-3 slide) (w/ images to describe)

- Suggested UI changes (1-3 slides)
- Summary of talk (1 slide)

## Presentation

\_\_\_ Use well-designed slides. Ensure that the presentation shows appropriate preparation, and that visual aids are aesthetic, effective, prepared, and properly employed. Make sure that people at the back of the room can read your slides (50 points)

\_\_\_ Cover the required scope within the **9 minute time period** (not including 2 minutes for questions/feedback). Practice and time your presentation in advance as we will cut you off if you go over. You will be unable to gain points for uncovered material (20 points)

\_\_\_ Ensure the presenter makes eye contact (10 points)

\_\_\_ Ensure the presenter projects their voice well (20 points)