

# CS 443/576, Spring 2014

## Project 3 — Evaluating design without users

**Due date:** The **beginning** of class on Tuesday, April 8.

**Design crits:** Tuesday, April 8 & Thursday, April 10.

### Project Goals

- To incorporate feedback into next iteration of design (from Project 2);
- To apply principles of good design;
- To learn, understand, and apply the Cognitive Walkthrough and Heuristic Evaluation methods.

### Project Description

\*Note that this is primarily an individual project. All students should hand in his/her own report separate from the rest of the team. However, Part B (2.c) does require team consultation/communication.

There are three parts to this project.

While evaluating your system design with actual users is of paramount importance, and something we will do later in the term, there are a number of other useful techniques you can use to evaluate your design in the absence of users. These techniques can be quite effective if implemented early in design, when any resulting changes are still relatively inexpensive to make. Another advantage of some of these techniques is they can be conducted by system designers.

For the first two parts of project 3 (Part A and Part B), you are to research and conduct a cognitive walkthrough and a heuristic evaluation on the current version of your system's UI design. Both of these evaluation techniques will be performed solely by you and will not include any actual users.

### Part A. Cognitive Walkthrough

1. Read carefully the following chapter: Evaluating the Design Without Users (Chapter 4), from *Task-Centered User Interface Design* by Clayton Lewis and John Rieman (<http://hcibib.org/tcuid/>). As you read, pay special attention to the details regarding Cognitive Walkthrough and Heuristic Evaluation.
2. Using your medium-fidelity prototype (i.e., design) and the specific information described in the reading, conduct a Cognitive Walkthrough on your system's UI. The following guidelines should help you with this technique:
  - a. Make sure your prototype design is somewhat stable before conducting this evaluation. For example, any changes to your design that you intend to make based on the feedback you received during the project 2 design crit should be done prior to continuing. Or, if your design was at all incomplete for project 2 in the sense that not all critical functionality was mocked-up, you should make it complete before continuing. Remember, at this point your design should include all of the major representative tasks that users will be able to perform with your system.
  - b. Develop task descriptions for **at least five of the major representative tasks** of your system. For example, one major representative task for a digital camera interface would be that users be able to take a picture and store it on their memory card.

- c. For each of the major tasks you identify, you need a complete, written list of actions needed to complete that task with your interface. This must be done accurately **before** you conduct the actual walkthrough.
  - d. Review who your users will be and what kind of experience they will have (from project 1).
  - e. Now that you've defined your interface, the major tasks, the correct action sequences, and your users, you're ready to begin the cognitive walkthrough. For each major task **and** each action in the list of correct actions, ask and answer the following four questions and tell a story about why the user would select each action:
    - [1] Will users be trying to produce whatever effect the action has?
    - [2] Will users see the control (button, menu, switch, etc.) for the action?
    - [3] Once users find the control, will they recognize that it produces the effect they want?
    - [4] After the action is taken, will users understand the feedback they get, so they can go on to the next action with confidence?
- Again, you must evaluate each of these four questions for every action in each of your major tasks.
- f. Using the results from your walkthrough, identify all problem areas in your interface (i.e., where your "story" falls apart or is not believable) and fix these problems. Re-sketch your interface to reflect your new design.

## **Part B. Heuristic Evaluation.**

**NOTE: You must complete Part A of this assignment before attempting Part B.**

Like the cognitive walkthrough, this heuristic evaluation will be performed solely by you individually and will not include any actual users. To conduct a heuristic evaluation, do the following:

1. Read carefully Section 4.3 Heuristic Analysis from Chapter 4 (Evaluating the Design Without Users of *Task-Centered User Interface Design* by Clayton Lewis and John Rieman (<http://hcibib.org/tcuid/>)).
2. Use your medium-fidelity prototype (i.e., design) after you've updated it from Part A of this assignment, and the specific information described in the reading, to conduct a Heuristic Evaluation of your system. The following guidelines should help you with this technique:
  - a. Use Nielsen and Molich's Nine Heuristics as identified in the reading for this evaluation.
  - b. The Heuristic Evaluation method is task-free. In other words, you can apply the nine heuristics to smaller pieces or sections of the interface without having to simulate any user tasks. For each heuristic and each section of the interface, describe your evaluation as presented in the example in the chapter reading. Overall, you should strive to review as much of the total interface as possible.
  - c. Summarize your results and share them with your team mates. Describe any changes you would want to make based on the heuristic analysis, and sketch some of them out.

### Part C. Universal Principles of Design.

Evin Ozer attended all project 2 design crits sessions and wrote up a file of feedback for all groups. This was included with your project 2 grade/feedback. In each of his write-ups, he recommended review of a number of Universal Principles of Design from your Lidwell, Holden, and Butler text specific to each of your designs.

For Part C of this project, you are to individually choose 1 of Evin's recommended principles, read through it carefully, and construct a one-page insert that describes the principle in relation to your design, similar to the format used in the book. For example, consider Figure 1 shown below that describes the principle of Symmetry. This example shows images and text that describes how the image relates to the principle concept. You are to create something similar, but using images from your UI design along with descriptive text that describes how the image represents the principle concept.

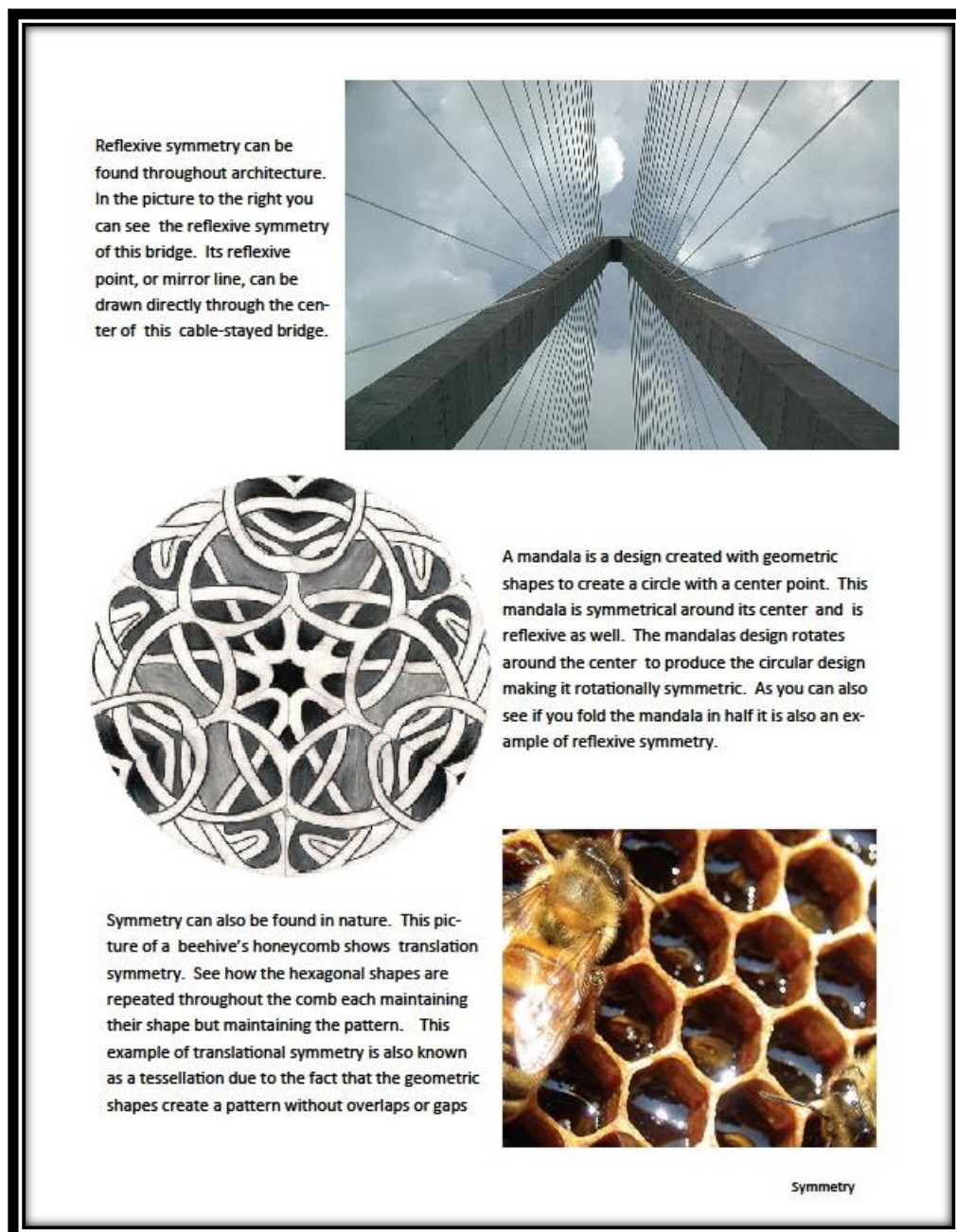


Figure 1. Example of Symmetry.

## WRITTEN REPORT

As with all projects in this class, you are to hand in a written report. This report will be an individual report handed in by each member of the class. Your report must be carefully constructed, formatted, and labeled (i.e., use headings to describe page content), and it must clearly convey all parts of this assignment. If your report is difficult to follow or I have to work hard to find what I'm looking for, your grade will suffer. Organize your report according to the following outline:

### Section 1. Iterative Design

Briefly discuss and show all changes your team made to your system's UI based on project 2 design crit feedback. You should also mention suggestions that you chose NOT to implement and why.

### Section 2. Cognitive Walkthrough

1. Present the descriptions for at least five of the major representative tasks of your system.
2. For each of the major tasks you identify, present a written list of actions needed to complete that task in your program.
3. For each major task **and** each action in the list of correct actions, present answers to the following four questions and tell a story about why the user would select each action. Use the example in your reading and the one presented in class as guidance. **Show relevant screen shots along with each question/answer combination.**
  - [1] Will users be trying to produce whatever effect the action has?
  - [2] Will users see the control (button, menu, switch, etc.) for the action?
  - [3] Once users find the control, will they recognize that it produces the effect they want?
  - [4] After the action is taken, will users understand the feedback they get, so they can go on to the next action with confidence?
4. Identify all problem areas in your interface that you discovered during the walkthrough.
5. Fix the problems uncovered during the cognitive walkthrough and present new screen shots that illustrate your new design.

### Section 3. Heuristic Evaluation

1. For each heuristic and each section of the interface, present your individual evaluation.
2. Summarize your results and the changes your team decided it wants to make based on the heuristic analysis.
3. Make these changes to your interface and present screen shots that illustrate some aspects of your new design.

### Section 4. Universal Principle of design

1. Include the one-page insert you created about one of Evin Ozer's suggested Universal Principles of Design (from the Lidwell et al. text). Include images of your UI along with narrative text that describes how those images support or illustrate the design principle/concept you chose.

## TEAM Design Crit

For the design crits to be held during class in week 10, your team should prepare a 25 minute presentation for the class. For this presentation, quickly remind the class what your system is, and then go directly to the results of your evaluations. Although you performed the two evaluations individually, during this team presentation, you should summarize those results and discuss how they influenced your design collectively.

Start with the cognitive walkthrough, and explain the major tasks you evaluated. Describe major breakdowns or problems with the story you try to tell (using the four cognitive walkthrough questions), and illustrate the design changes you made to fix these problems. Continue on with the heuristic evaluation. Summarize the results your team came up with, the changes you decided needed to be made to your system, and your new design. Remember that all team members are expected to participate in the oral presentations.

**\*\* Note that graduate students will be held to a higher standard than undergrad students in the class. This means that I will expect their systems to be more complex, include more functionality, and have very well-thought out designs.**

## Evaluation:

The scoring for this assignment will be roughly as follows:

<b>Component</b>	<b>Max value</b>
Changes your team made to your system's UI based on project 2 design crit feedback. Mention of suggestions that you chose NOT to implement and why.	10
Cognitive Walkthrough	
• 5 major tasks and correct action sequences	5
• Question/answer for all tasks/actions, including screen illustrations	15
• Problem identification	5
• Re-design iteration 1	5
Heuristic Evaluation	
• Individual list for each heuristic and each section of interface	20
• Problem/changes identification	5
• Re-design iteration 2	5
Universal Principles of Design	10
• One-page insert illustration of your UI in relation to chosen design principle	
Overall quality of written report	10
Classroom presentation/design crit	10
<b>Total</b>	<b>100</b>

Questions? Email [reimer@cs.umt.edu](mailto:reimer@cs.umt.edu)