CS / Psych 6750
Human-Computer Interaction
Spring 2013

Contact Info

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Spring Semester 2013

Class meets in Klaus 1447   MWF 1:05 – 1:55 pm

Texts:

There are two required textbooks for the class. In addition there will be other reading assigned during the semester.

- *Interaction Design: Beyond Human - Computer Interaction* (3rd ed.), by **Yvonne Rogers, Helen Sharp, Jenny Preece**. Wiley, 2011.
  Book web site: http://www.id-book.com/
  Available at the GT Book Store. See also: amazon.com and other places for both new and used editions. It is also available in electronic format.

- *Understanding Your Users: A Practical Guide to User Requirements Methods, Tools, and Techniques*, by **Catherine Courage and Kathy Baxter**. Elsevier, 2005.

Available FREE in electronic format via the GT Library. See GT Library Page for the book. Also available at the GT Book Store in paperback. See also: amazon.com and other places for both new and used editions.

- Optional: **The Design of Everyday Things, by Donald Norman**. Currency/Doubleday, 1990. Available at the GT Book Store and library. See also amazon.com and other places for both new and used editions. The first four chapters contain the gist of what we will cover this semester.

Additional Reading

- Additional readings will be posted as PDFs on the class web site on T-square. It is the responsibility of the students to obtain and read the extra material. The material in those extra readings may be included on tests and other evaluations in the class.

- One book that will be referred to a lot is: *Universal Usability*, edited by Jonathan Lazar. Wiley, 2007. PDFs of relevant chapters will be posted on T-square.

- Lecture materials, assignments, announcements, and schedule changes will be posted to T-square, so please check regularly!

- Make sure to check T-square often; there WILL be updates to the syllabus, course schedule, assignments, and lectures, guaranteed.

Class Schedule Spring 2013 (subject to updates)

Week	Date	Topic	Reading	Assignment	Project
1	1-7 1-9 1-11	Class Intro, syllabus History and Background of HCI Team project meetings	ID 1,2	CITI Training	Post bio and photo to t-square wiki Form teams
2	1-14 1-16 1-18	Design of Everyday Things 1 Design of Everyday Things 2 User Centered Design	DOET 1-4 UYU 1,2,3	H1: HOF/S	Part 0: proj description due

3	1-21 1-23 1-25	GT HOLIDAY – No class Interdisciplinary Teams – structure Human Abilities 1 (sensory)		H1: HOF/S due	IRB app due
4	1-28 1-30 2-1	Human Abilities 2 (cognition) Requirements 1 - Task Analysis Requirements 2 – Interviews and Surveys	ID 3 UYU 4,5,6 ID 10	Vote on HOF/S due	
5	2-4 2-6 2-8	Requirements 3 – Needs analysis and focus groups Evaluation 1 – Predictive models Evaluation 2 – Descriptive models	UYU 9, 12 ID 15, CMN paper, Fitts paper Nardi paper	H2: Human modeling	Part 1: Reqs due
6	2-11 2-13 2-15	Design 1 - Principles Design 2 – Visual design Design 3 – Typography Design 4 - Color	ID 11	H2: Human modeling due	
7	2-18 2-20 2-22	Design 5 – Icons review for midterm Midterm poster session Midterm exam			
8	2-25 2-27 3-1	Interactivity 2013 Interaction styles: WIMP, Gestures, DM, Speech Interaction styles con't	ID 6 Lazar Ch 6,14,17	Present or attend	Part 2: design alternatives due
9	3-4 3-6 3-8	Universal Design and Assistive Technology Rapid Prototyping		H3: Observation	

		UI Toolkits			
10	3-11	Evaluation 1 – Intro	ID 12,13,14		
	3-13	Evaluation 2 – Quantitative			
	3-15	Evaluation 3 – Qualitative		H3: Observation due	
11	3-18				
	3-20	SPRING BREAK			
	3-22				
12	3-25	Evaluation 4 – Analysis, special populations	Lazar 14,15		
	3-27	Errors			
	3-29	Help and Documentation			
13	4-1	Affect and Emotion 1	ID 5		Part 3: Prototype due (schedule demo with TA)
	4-3	Affect and Emotion 2			
	4-5	Designing for the web			
14	4-8	Mobile and Ubiquitous comp 1			
	4-10	Mobile/Ubicomp 2			
	4-12	Information Visualization			
15	4-15	Computer Supported Cooperative Work (CSCW)			
	4-17	Data Analysis, Synthesis, Interpretation	UYU 14		
	4-19	Data presentation, iterative design			
16	4-22	Course wrap-up and review for finals			
	4-24	Final Poster Presentations			
	4-26	Final Poster Presentations			Part 4: Evaluation due

finals week	5-1 (Wed)	2:50 pm – 5:40 pm FINAL EXAM			

Grading

- Group project (30%)
- Mid-term (20%)
- Final (30%)
- Homework and Classwork (20% total)

CS/Psych 6750 Team Project

Theme for Spring 2013: To Your Health!

Computer interfaces are all around us; in our homes, our cars, even on our bodies.   Your task this semester is to create a design and a prototype for an interactive application to support health in some way. It could be in the area of fitness, disease prevention, health monitoring, or a specific health issue (diabetes, arthritis, other chronic diseases), among others. You are encouraged to think along the lines of supporting a non-profit organization if possible. You and your teammates will design, build a simple prototype (a.k.a. does not have to be fully implemented, but the interface design should be testable) and evaluate your idea.

Outline

Quick access to the sections of this document:

Project Overview

This term you will undertake a group project (4 team members) to evaluate some computing-related task/problem, to develop interface design alternatives for the task/problem, to implement a prototype of your design, and to evaluate your design. This project should provide you with hands-on experience with the tasks that interface designers face every day. Ideally, the topic of the project will be a problem that matters to some "real-life" people.

Each project group will be graded as a team, that is, each person receives the same grade. Periodic team reports will be required to evaluate the contributions of each team member. Lack of participation will precipitate an individual reduction of grade. Within the team, you must negotiate on how much and what each person will contribute. Think carefully about your team members: Where do people live and what hours do they work? Where will you meet? What skills do the different individuals bring to the group (computing, programming, design, evaluation, statistics, etc.)? I would strongly encourage you to form a heterogeneous team full of individuals with varying skills.

Project Report Portfolio

Each part of the project will include a deliverable report. This report will be placed on the web in an electronic format; a paper copy will also be handed in. Each team should have a "home" page which includes: 1) a brief (paragraph) description of the problem/task; 2) the team members; 3) Links to the reports for project parts 1-4. The format of the reports for the individual parts is ultimately up to you, but there will be templates for the sections, to help your team know what to expect, and what is expected. In any case, it should be professionally prepared, concise yet expressive, grammatically sound, illustrative of your efforts and process, and easy to view and understand. A good design effort can easily be hampered by a poor communication of what was done. Make sure to include ALL SECTIONS of documents required in order to earn the maximum points.

Part 0 - Topic Definition

This first part of the project is relatively simple. You must list the members of your team and identify the problem area that you will be working on. You also must set up your web project space on T-Square that lists your team name, members, and provides links to all of the project deliverables.

Part 1 - Understanding the Problem

The key goal of this first substantive part of the project is to deeply understand that **problem space** that you are addressing, its set of pertinent users, and the issues and constraints that are involved in the problem. If the task has an existing system/interface, you should perform an interpretive evaluation of that system to help you learn more about it. Most important is to identify important characteristics of the problem that will influence your subsequent design.

In class and in the readings you will learn about different techniques for acquiring this kind of information. You are encouraged to utilize the techniques that you feel are most appropriate to the particular task you are examining. Your report and deliverable for this part should deeply examine the problem of study. Who are the potential users? What tasks do they seek to perform? What functionality should the system provide? Basically, you are setting up a set of constraints for your subsequent design. What criteria should be used to judge if your design is a success or not?

More specifically, you should develop the following items in this part, and you should communicate them through your report:

- An overview of what the system will do and why it's needed.
- A description of the important characteristics of the users of the system.
- A task analysis consisting of
    - A description of the important characteristics of the tasks performed by users.
    - A description of important characteristics of the task environment.
    - A simple structured task analysis of the problem in one of the forms described in the textbook.
- An analysis of the existing system, automated or manual, including its strong points and deficiencies.
- A description of the larger *social and technical system or context* in which your design will intersect.
- An initial list of usability critieria, or principles, that should be used in the eventual evaluation of your design, including a high-level description of how you could measure the successful adherence to these principles.
- A brief description and justification of how the above information was gathered.
- **Most important**: A discussion of the implications of what you learned above.

The last item in the list above is critical. Don't just describe the target users, tasks, environment, etc. You must also tell us how these attributes should/will influence your design. Are there any implications to be made from the user profiles and other data you learned? We will be very careful to look for this information in your report.

Part 2 - Design Alternatives

The key goal of Part 2 of the project is to use the knowledge gained in Part 1, as well as that from class, to develop a set of design alternatives for your problem. This is the stage of "informed brainstorming". These multiple design alternatives should explore the potential **design space** for the problem.

In this part of the project you will develop mock-ups, storyboards, and sketches of at least three of your interface designs. That is, you should provide pencil-and-paper or electronic images of the interface at various stages; you do not need to build a working prototype. Your design sketches should be sufficiently detailed for a potential user to provide useful feedback about the design, however. Along with your design mock-ups, you should

provide a brief narrative walk-through of how the system will work. Perhaps most importantly, you should also include your justifications for why design decisions were made, and what you consider to be the relative strengths and weaknesses of your different designs.

The design process you follow here is important. **Don't do the following:** The group splits up and everyone creates one design, then these are all your alternatives to be turned in. This is not how a good, creative design process should work. It should be more like a brainstorming session with all team members present. You should seek to create some fundamentally different design ideas, concepts all over the potential design space for the problem you have chosen. The key is to push the boundaries of the space of design possibilities.

Your project report should include all the explanatory material mentioned above as well as all the design sketches, drafts, storyboards, etc., that you generated. If some of your sketches are on paper, either scan or photograph the material and convert it to an appropriate electronic format. Make sure that your report adequately reflects the design process that your group undertook. The key in this part of the project is to come up with *many* different design ideas, not just a small set of wiggles from some basic design. You should plan on turning in at least three different designs.

We will utilize one full class day as a **poster session** near the end of this part of the project. Each group will post their design ideas on a poster in class. Everyone will then circulate and interact with the designers. The idea here is that each group can use this opportunity to get feedback about their design ideas as they narrow their design space and head into Part 3 of the project.

Part 3 - System Prototype and Evaluation Plan

In part 3 of the project, your group will implement a detailed prototype of your interface. You can use any prototyping tools that you would like to assist this process (e.g., VB, Hypercard, Director, clay, paper, 3D printer, plastic, etc.). You should be able to get much of the interface functionality working, but clearly you will not be able to implement all back-end application functionality.

Additionally, you must provide a set of initial usability specifications for your system and a plan for an evaluation of it. To develop usability specifications, consider the objectives of your design. For example, if you are working on a calendar manager, you might specify time limits in which you expect a user to be able to schedule or modify an appointment, or a maximum number of errors that you expect to occur. Basically, you should list a set of criteria by which your interface can be evaluated.

Further, this part of the project should include an initial evaluation plan for the system. What kinds of benchmark tasks would you have users perform to help evaluate the interface? What kind of subjective questionnaire would you deploy to have a user critique the interface? You will need to actually carry out some of this evaluation in Part 4, so you

should do your best to set it up now. The key here is not to do some exhaustive description of a usability evaluation plan, but to motivate why the particular plan you propose is appropriate for this interface.

Note that developing an initial evaluation plan is also a good way to figure out how much of the interface you need to develop. You should be able to build and connect enough of the application functionality to be able to conduct an initial usability evaluation with the benchmark tasks as you are proposing here.

Your write-up for this part should include a description of your system prototype. You can include screen dumps to help explain it and text to describe how a user would interact with it. Discuss the implementation challenges you faced. Were there aspects that you wanted to build but were unable to do so? The key component to include in your project report is a justification of why you settled on the design that you chose. What's special about this particular design with respect your problem?

The report for this part also must include the usability specifications that you established and a description of the evaluation that you are planning. This need not be too detailed here as the actual evaluation will occur in Part 4. We will try to give you helpful feedback about your plan here to assist with the testing in Part 4.

After this part is complete, each group will demo their system for the professor outside of class time.

Part 4 - Evaluation

In the final part of the project, your group will conduct an evaluation of the prototype developed in part 3. You should utilize the evaluation measures that you identified in that part as well. We expect that your evaluation will involve sample users interacting with your system. These users will likely be your client(s) and maybe other students from class or other people who would fit your target user population. Give the users a few simple benchmark tasks and have them interact with your interface. Closely study what occurs. Deploy a questionnaire to get their subjective feedback about the interface and interaction.

Your write-up for this part should include the following components:

- A description of the evaluation techniques, tasks and users involved in your study
- Design rationale for the evaluation tasks and materials you employed
- Description of the results of the study (data presentation)
- A discussion of the results
- The implications that you make from the results with respect to your design
- A description of how the prototype design could be improved in light of the implications

The key to this part of the project is not to simply describe your evaluation methodology but to rise above that and describe what you learned from it. Explain why you chose the benchmark tasks that you did. Why did you ask users what you asked? What conclusions can you draw from the studies? What aspects of your design "worked" and what failed to meet your specifications? If you had more time to work on the design, what would you now change and improve? Remember, no designer ever gets a system "just right." We will reward teams who honestly and carefully assess their design and who clearly provide a plan for its improvement.

Final Project Poster Session

Last week of classes
The design project will culminate in a session in which each group presents their system to the class, industry visitors, and HCI faculty through a final poster session. Each group will be expected to give a 5-minute professional summary and walk-through of their design and prototype and answer questions. It is important that you do a good job communicating all your efforts for the semester. You want to make sure that your objectives in the project are discussed, your system is clearly presented, and that your design process is communicated. Also describe what you learned from your usability study. Practice your presentation!