HCI Area Qualifying Exam (Written Portion)

Spring Semester 2010
Thursday March 18, 9am-5pm.

Answer FOUR questions as follows: Answer any TWO of the four questions from Section A (HCI Process and Theory). From Section B (Special Topics in HCI), answer ONE question from EACH of your TWO declared areas of specializations.

Each of the four questions you answer will be given equal weight.

You will be assigned an identifying number and are required to hand in final versions of your written answers with each page identified only by that number. This enables us to grade your answers anonymously. You should NOT identify yourself explicitly by name on your answer sheets or implicitly by referring in the first person to your work (my project on ABC).

Please answer each question starting on a new page, with your answer following the text of the question. To avoid having to type the questions yourself, electronic copies of the questions will be available after 9am from a URL that you should already have been given. You may copy the questions from there.

Place any relevant references that you cite in an answer at the end of that answer, NOT in a separate section at the end of the whole exam.

If you have any questions or feel it necessary to make any assumptions in your answers, do not seek clarification from faculty or staff. Simply record your assumptions as part of your answer.
Section A: HCI Process and Theory – answer any TWO of questions 1 through 4.

Question 1
Pick one paper from the HCI core reading list (or from either CS 6750 or CS 6455) and pretend you are reviewing this paper for a journal or conference in HCI. Provide a review of this paper as if you were on a program committee or editorial board trying to decide whether to accept the paper for publication today. In your review, address the following aspects:

A. State what the paper is that you are reviewing.

B. Clearly identify what conference or journal this paper should be submitted to and that you will be reviewing for.

C. Provide a paragraph summary of the research contribution of the paper.

D. Identify the specific strengths of the paper as a research contribution.

E. Identify the specific weaknesses of the paper as a research contribution. For each specific weakness, indicate how you would want the authors to improve the work if they were to resubmit it to the same conference or journal.

F. Critique the background and related work for this paper. In this critique, being done in 2010, provide examples of additional background and related work that might have been published since the original paper. Pay particular attention to readings in the current HCI Body of Knowledge.

Question 2
You have a project to design a customer kiosk for Starbucks – customers will place orders there, and the baristas will have a monitor showing what they need to make next, and for whom.

A. Who are the stakeholders in this endeavor – those whose points of view/needs/issues you will want to understand? For each stakeholder, write a sentence or two explaining why.

B. If you had to choose a single method to understand customers regarding the kiosk, which would it be? Explain why, and explain why you chose not to use three other potential methods. Go into detail – we want to understand your reasoning.

C. What HCI theoretical framework would be most useful to apply in conceptualizing the system? Explain your answer.
**Question 3**
What is Grounded Theory? In your answer be sure to step beyond the analysis process and include discussion of the type of theories it produces, its theoretical origins, its stance on epistemological and ontological concerns.

**Question 4**
In 1997, Ben Shneiderman and Pattie Maes had a public debate at CHI 1997 entitled, "Intelligent Software Agents vs. User-Controlled Direct Manipulation" the day before. In his abstract, Ben stated:

"Agent promoters believe that the computer can automatically ascertain the users' intentions … I am skeptical that user intentions are so easily determined …

Designers believe that they are creating something lifelike and smart, however users may feel anxious and unable to control these systems. Success stories for advocates of adaptive systems include a few training and help systems that have been extensively studied and carefully refined to give users appropriate feedback for the errors that they make. ...."

At the time, the press was full of "intelligent agents" with faces, either robotic or rendered, which responded in some form of "natural" language. It was easy to assume Ben was criticizing these agents. Yet, Ben's comments at the debate seemed to be talking about intelligent agents in general, including ones that are embedded in everyday interactions.

A. Complete the following rebuttal to Ben:

"Ben, in your talk you said there have not been successful systems that use autonomous agents, yet you yourself are using them all the time. For example, …"

Provide an example where Ben is already using an "intelligent agent" in his daily life. Explicitly say how the agent is determining his intentions and taking autonomous steps in response.

B. Do a task decomposition for your chosen example to show why your agent is "so good at its job" that Ben does not mind that is there.

C. Show where your autonomous agent affects the user's experience in Norman's seven stages of action,

D. Suggest a principle (or principles) for creating autonomous agents that avoid Ben's criticism above.
Section B: Special Topics in HCI

Information Visualization – answer ONE of questions 5 or 6.

Question 5

Consider the statement:

"Information visualization systems do not incorporate research from human cognition, cognitive science, and psychology adequately enough."

Take a position on each side of that argument (both in favor and against, one at a time) and support the position with a discussion, making sure to cite examples from the research literature in your commentaries.

Question 6

Two common visualization techniques for presenting graph/network data are node-link and matrix representations.

A. Explain the benefits and weaknesses of each style. Make sure to include various dimensions in your discussion such as ease-of-implementation, scalability, comprehension, appropriateness for various user tasks, etc.

B. Consider new, so-called attribute-based graph representations such as Wattenberg's PivotGraph and Shneiderman's Semantic Substrates. Are these techniques node-link or matrix representations?
Ubiquitous Computing – answer ONE of questions 7 and 8.

Question 7

A. Explain why ubiquitous computing is considered the third generation of computing. What dimensions differentiate ubicomp from the previous generations.

B. How would you characterize a netbook, based on three generations of computing?

C. Weiser characterized computing form factors in terms of three scales. Identify and give examples of all three scales. What kinds of technologies that are relevant to ubicomp today do you think are missing in Weiser's three scales?

Question 8

This question deals with location and privacy.

A. What is client-side location determination? Give an example of a calculation of location that is purely client-side. What are the privacy implications of this solution?

B. When does client-side location determination violate privacy concerns? Give an example of one technical solution to address this privacy concern.

C. Describe how a fingerprinting technique for location determination works? List some advantages and disadvantages of fingerprinting for location determination. Be sure to discuss both technological as well as privacy issues in your answer. Note that there are design options that can be considered for a fingerprinting solution that are relevant to the previous parts of this question.