CS 3724 - Review for Final Exam

The exam will cover all of the readings and course notes from the syllabus (after the midterm), as well as anything we discussed in class (after the midterm). I will be looking for thoughtful answers and solid arguments on the discussion questions.

The test is closed-book, closed-notes, and will be given in class. You will have the entire exam period (2 hours) to do the test. Approximately 40 percent of the grade will be for objective questions (true/false, multiple choice, matching, or simple short answer), and approximately 60 percent will be for discussion or essay questions.

Concepts and terms you should be familiar with:

- expert-based evaluation
- rationale for expert-based evaluation
- GOMS
- keystroke-level model
- cognitive walkthrough
- heuristic evaluation
- the "M" (mental processing) operator in the keystroke-level model
- exploratory learning (basis of cognitive walkthroughs)
- Nielsen's 9 heuristics
- advantages/disadvantages of various types of expert-based evaluation
- user-based evaluation
- formative vs. summative evaluation
- evaluation with a "Wizard of Oz" prototype
- informal user studies
- usability studies
- formal experiments
- quantitative vs. qualitative measurements
- objective vs. subjective measurements
- verbal protocol ("think aloud")
- informed consent
- system exploration vs. structured tasks in evaluation
- pre-and post-testing
- issues in recruiting users for evaluation
- usability laboratories
- remote evaluation
- critical incidents
- interaction techniques
- interface elements / widgets
- UI metaphors: conversational, sim. world
- desktop metaphor
- issues in menu design
- form fillin style
- command language style
- direct manipulation style
- WYSIWYG
- engagement
- articulatory & semantic distance
- advantages/disadvantages of various interface styles
- interaction technique implementation issues
- event-loop/event-driven programming
- finite state machine representation of ITs
- ITs for standard interaction tasks
- pick ambiguity
- degrees of freedom (DOFs)
- absolute vs. relative locators
- discrete vs. continuous devices
- multimodal interaction
- designing hypertext/hypermedia
- Web interfaces
- characteristics of the Web affecting UIs
- intelligent agents
- pen-based computing
- ubiquitous computing
- virtual environments
- augmented reality
- wearable computing

Examples of objective questions:

1. Name and define three methods of expert-based evaluation.
2. Give three of Nielsen's heuristics for interface design.
3. What is the concept of "verbal protocol"? Name one situation in which it might be used.
4. What special features do usability laboratories have that make them especially appropriate for user-based evaluation?
5. Name two advantages for the use of a command-language style of interaction.
6. Draw a finite state machine that describes an interaction technique for a pop-up menu with three items.
7. How many degrees of freedom does a standard two-button mouse have?

Examples of discussion/essay questions:

1. Compare and contrast the utility of a heuristic evaluation and a usability study. For a brand-new interface, which type of evaluation is likely to reveal the largest number of usability problems? Do the different types of evaluation reveal different types of problems?
2. Cognitive walkthroughs are based on a theory called "exploratory learning". Define this theory. What assumptions does it make about users and their behavior? Are there situations where these assumptions do not hold?
3. What are the differences between input devices, interaction techniques, and interface elements? Name some standard input devices, interaction techniques, and interface elements on a typical PC to illustrate your answer.
4. Design an interaction technique for the task of moving a graphical object in three dimensions using a standard two-button mouse as the input device. Describe in detail the interpretation of the mouse input, any interface widgets used in the technique, and the feedback given to the user.
5. What are some disadvantages of direct manipulation? Give examples.
6. Why is it necessary for most current interfaces to mix the conversational and simulated world metaphors?
7. In your opinion, what interface style will supersede the desktop? Why?