New Jersey Institute of Technology
Department of Industrial and Manufacturing Engineering

IE 662 Cognitive Engineering, Fall 2003
Instructor: Harry E. Blanchard

Final Exam

NAME: _____

Instructions

This is a take-home exam. You may consult any reading material you like, but it is neither necessary nor required to go beyond the readings and lectures assigned in this course. Do not cooperate on your answers with other students.

Due Date: 12/18/2003

Options for delivery:

- Email to hblanchard@att.com or tests@hblanchard.com
- Fax (toll-free number): (888) 866-4891
- Alternate fax: (732) 876-0367
- Deliver to office of Dr. One-Jang Jeng, Room 2509 GITC Building (Guttenberg Information Technologies Center, off Central Avenue)

Electronic submission:

You may submit Microsoft Word, Adobe PDF, or plain text files..

I will also accept many other formats, e.g. RTF, Framemaker, TeX, Word Perfect, Unix text -- but contact me by email first if you use another format.

If you have concerns about privacy, the account tests@hblanchard.com has been set up expressly for this exam, and the account is administered and accessed only by me.

A copy of this exam is posted on the website http://www.hblanchard.com/ie662/

Any other class assignments that have not been handed in must reach me by 12/18/2003.

Please answer in complete sentences and paragraphs (as appropriate). The questions can be answered in one page or less. Each question is worth 10 points.

1. What is the *user interface* definition of an affordance, in your own words? Provide an example in your definition. How might you determine if you have an "affordance" in your product design?

2. In the lectures, we discussed the examination of the methods of heuristic evaluation versus usability testing. Explain these two methods. What have been some of the results of competitive tests of these two methods in the literature? How the Fu, Salvendy, & Turley study (discussed in the lecture) come up with a harmonious resolution of the literature on this topic?

3. Nielsen describes a type of rapid prototyping he calls a "scenario" – define this and contrast it to vertical and horizontal prototypes as defined in the lectures. What completely practical reason(s) would a project have to produce a "scenario" prototype instead of a full vertical or horizontal prototype?

4. In the Bergman interview of Haitani (in your readings), Haitani explains some of the early development of the Palm Pilot. Summarize what you think were some correct decisions made. Based upon the techniques discussed our "Usability Techniques" lectures, what techniques did the Palm Pilot development use?

5. Give 3 examples of menus besides the obvious pull-down menus of Microsoft windows. Try to illustrate the variety and broader definition of 'menu'. What is meant by "depth" and "breadth" in the design of menus?

6. What, according to the lectures, does the literature conclude concerning depth vs. breadth in HCI menus? Does the issue of depth and breath in menus apply to web design? Design of telephone system menus? Are there different conclusions for depth vs. breath for web design? Telephone systems?

7. What is the difference between a Within-Subjects and a Between-Subjects experimental design? Imagine you were designing a study to determine if it is faster *to learn* to type on an alphabetic versus QWERTY keyboard. You have identified users who have almost no experience in typing on a keyboard, and so can learn from scratch. Which experimental design would you use? Explain your reasoning.

8. What is a think-aloud protocol, according to your textbook? What are some problems or objections with using the think-aloud technique? Bond and Camack have an issue with the use of think-aloud technique in designing a telephone-based service. Be sure to explain their objection in particular.

9. What is anthropomorphism in a user interface? Give some arguments for and against using anthropomorphism.

10. In chapter 11 of your book and in the lectures, the matching of input devices to work or task was discussed. Imagine you have the choice of a joystick, mouse, and touch screen for a computer user interface. There is a software program for Kindergarteners to be used in school. In this program, students select letters and drag them to objects that begin with that letter. What are the preferred input device or devices for this application and why? You might cite issues of naturalness, work environment, and practical considerations.