# CMSC 434 – Spring 2008
# Prof. Bederson
# Midterm – March 26, 2008
# 6 Questions – 100 Points

Answer each question as simply and clearly as possible (while answering the question).  Full sentences are not necessary.  Less is more.

1.  ~~History (8 pts)~~

~~(8 pts) For each of the following historical people/systems, give the approximate year it was announced (± 5 years) (1 pt), and one salient characteristic that makes us look back on it as being important in the history of HCI (1 pt).~~

~~a.  Bush – As We May Think~~

~~b.  Sutherland – Sketchpad~~

~~c.  Engelbart – NLS~~

~~d.  Xerox Star~~

2. **HIP (13 pts)**

   a. **(3 pts)** Name the three processing units in the HIP model defined by Card, Moran and Newell.

   b. **(10 pts)** Analyze the following question using HIP by first writing down the steps in sequence that must be performed by a human to answer the question, and then sum it up to produce a simple formula for the total time in terms of the processing units. (Do not specify any actual times.)

   Question: "Do two letters have the same name?"

3. **Fitts' Law (13 pts)**

   a. **(3 pts)** Describe in English what Fitts' Law is, what the essential independent variables are, and how the dependent variable relates to them.

   b. **(3 pts)** Some toolbars offer the option of displaying a label below the image icon for toolbar buttons. Assuming that there is no cognitive factor in recognizing the button, what would be the likely speed difference between the button with image only vs. image and text label?

   c. **(3 pts)** The cursor is known to be within 10 pixels of the exact center of a 20", 1600 X 1200 pixel screen. You will place a single-pixel target on the screen that the user must point to exactly. List the five pixel locations on the screen that the user can access fastest.

   d. **(4 pts)** You have a palette of buttons in a graphics application that consists of a matrix of 16x16-pixel icons laid out as a 2x8 array that lies along the left-hand edge of the screen. Without moving the array from the left-hand side of the screen or changing the size of the icons, what steps can you take to decrease the average time necessary to access the buttons? (redesigning the tool palette is ok).

**4. Design Principles (24 pts)**

**(24 pts)** For each of the six design principles below, define (2 pts) and give a clear example of each (2 pts). Describe example briefly and sketch if necessary.

   a. Affordances

   b. Conceptual model

   c. Mapping

d. Visibility




e. Feedback




f. Causality

5. **Design process (20 pts)**
   a. **(12 pts)** For each of the following user roles, define (2 pt) and give one reason (1 pt) **NOT** to engage users in this role in the design of a product.

   - User

   - Tester

   - Informant

   - Design Partner

b. **(8 pts)** For each of the following prototype terms, define (2 pts), and describe when in the product creation process it is most appropriate to use this technique (2 pts).
- Low-fidelity prototype

- Wizard of Oz

6. **Learning / memory (20 pts)**

   a. **(9 pts)** What are the 3 stages of skill acquisition? Briefly describe each stage.

   b. **(3 pts)** A participant is presented with an interface she has never seen before and asked to perform a simple task with it. Which stage of the skill acquisition process is most likely to be at play then? Why?

   c. **(5 pts)** What are the two key problems-solving operators used during that stage, and briefly describe them?

   d. **(2 pts)** Can such mechanisms sometimes be counter productive? Why?