HCI Final Examination

Name _____

December 10, 2018

Closed Book, Open Notes (three handwritten pages), 165 minutes. Please answer concisely.

If you leave the classroom for any reason, your test will be graded on only what you did up until that point. This also applies to use of the restroom.

1. [12] True or False
    a. **T F** The Eight Golden Rules of Interface Design are especially important when designing games.
    b. **T F** Gulf of Evaluation issues relate to the users's ability to interpret system feedback or status indicators.
    c. **T F** Autocompletion (that is, predictive text entry) is relatively less useful for mobile (small-screen) devices.
    d. **T F** Graphical User Interfaces were invented in the 1970s and 1980s.
    e. **T F** Human Factors Engineering is the same as Ergonomics.
    f. **T F** Cursor hinting (in which the shape of the cursor is changed to indicate to the user the current state and what actions are now available) is common in form fill-in interfaces.
    g. **T F** Chording can be useful for one-handed typing.
    h. **T F** An input device applying resistance to certain user actions/motions is using haptics.
    i. **T F** A personna is an imaginary, representative user.
    j. **T F** Animations can be used to indicate an affordance, that is, to invite interaction.
    k. **T F** Different stakeholders can have conflicting needs and desires.
    l. **T F** Of the four actions in the GOMS KLM, P (the pointing operation) is the longest.

2. [2 points] How does teleoperation resemble virtual reality? How does it differ?

3. [3] Elves are like humans, but smaller, cuter, and not so smart. Their fingers are tiny and incredibly quick and accurate, and they enjoy repetitive actions. Name one interaction style that would be good for elves, and one that would be less suitable. Give a concise reason for each.

4. [3] You have been hired to work on a new version of the Naughty/Nice Monitoring System for Red Lord Enterprises. You tell the Head Elf that you plan to start by ethnographic observation and stakeholder analysis, but she says "that's not what we need; just get busy on the design." What would you say to convince her reconsider?

5. [5] In Powerpoint, when "gravity" is turned on, if you move one object near to another, it may suddenly snap into place right next to it, as if magnetically attracted. Explain, at a high level, how this is implemented, using at least three of the following terms: widget, event, handler, cursor, redraw, model.

6. [3] The evil XyGargs are planning to invade Earth with a robot army. The software they use to teleoperate the robots is built using the Model-View-Controller design pattern. You have the capability to insert a backdoor in just one of the modules, enabling you to dynamically control the behavior of that module during the invasion. Which do you choose, Model, View or Controller, and why?

7. [1] (Swapnil) A cognitive walkthough mainly evaluates the product's _____
   a. Likeability
   b. Learnability
   c. Utility
   d. Efficiency of use

8. [2] (Isht) With a mouse many things are possible, including positioning, tracking, selecting, and drawing. Which two of these does the mouse do best?

9. [5] Which of the following are usability goals (U) and which are functionality goals (F)?

   a.   ___ allow the user to change the password up to 3 times a day
   b.   ___ keep all response times under 800 milliseconds
   c.   ___ enable users to learn to create a new task after only a 90 second tutorial
   d.   ___ backup all data to the cloud every 4 minutes
   e.   ___ ensure that the user enters an food expiration date incorrectly less than 1.5% of the time

10.   [2] An ethnographic observation necessarily includes which two of the following?
   a. Having each user fill out a questionnaire
   b. Talking to the users
   c. Writing down observations
   d. Creating a detailed list of bugs in the current software
   e. Creating personnas

11. [1] A datepicker, as in the figure at right (from webix.com), is a kind of _____

   a. skin
   b. widget
   c. business logic component (rule)
   d. observer
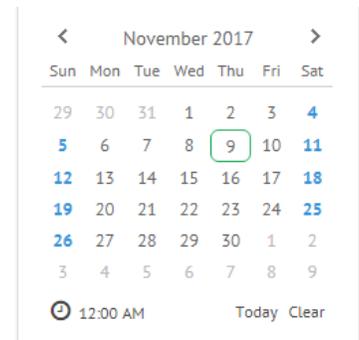
12. [2] (Stephen) What is a response time choke? What is the benefit?

13. [1] Programming event-driven systems is hard. Name one interaction style which minimizes the number and variety of events the programmer needs to handle.

14. [2] The primary interaction style of both the Restaurant Decider system and the Travelr system was form fill-in. Why do you think the designers made this choice?

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15. [4] (Jesus V.) On the freeway most people control their car mostly with steering wheel and accelerator. Draw a state diagram for the related aspects of the car's behavior, or explain why a state diagram would be unsuitable for this.

16. [4] User interface design often centres on identifying an appropriate abstraction for an underlying computer system. For example, the waste-paper basket on the desktop of most operating systems provides an abstraction of the delete function. Files are deleted by placing them in the waste-paper basket.
    Explain and illustrate one of the dangers associated with hiding the underlying complexity of computer systems in this way. (from Chris Johnson, DCS Glasgow)

17. [10] Some keyboards are programmable, meaning that one can change the key event associated with a physical key. For example, the Kinesis keyboard has a "Progm" key. Perhaps you could use this in a key sequence like

Progm   Control-I   F   Progm   F12   Progm

to make the F12 key equivalent to the "Control-I F" sequence. (I'm not sure because: 1. I'm too lazy to find the manual, 2. I'm worried that if I experiment with Progm it might mess up my keyboard, 3. I'm unlikely to remember how I programmed it.) A possible way to make this functionality more useful would be to create a GUI that appears whenever the user presses the Progm key.

    a)   [2] Chose a suitable interaction style for this problem and justify your choice.

    d. [8] Sketch and explain a GUI for this application.

18. [4] The textbook discusses "anxiety," "alienation," and "organizational fragility" as among the "plagues of the information age." Pick one of these and explain how participatory design, or some other method discussed in class, can reduce the problem, not only for the direct participants, but for society more generally.

19. [3] You have assigned three rival design teams to produce a prototype for a new user interface. Two of the designs are similar, but Monica's team's is very creatively different. You decide to show all three to the customer. Before you do, one of the team leaders comes to you. "Boss," he says, "you're making a terrible mistake. Monica's design would be hard to implement, and anyway it doesn't really meet the customer's needs. We should present only the designs that are realistic." Realizing that he's forgotten an important function of prototypes, you reply "what you say about Monica's design is true, but we're still going to show it to the customer, because _____ ."

    Finish the sentence.

20. [6] Imagine that you have been asked to manage the design and building of a new website for a community worship center, with a time budget of 150 person-hours for the project. Prepare an ordering of activities with 3-5 stages, that includes all of the following:

    ① Inventing Personnas
    ② Sitepath Diagramming
    ③ Card Sorting to Categorize the Content
    ④ Observing Users
    ⑤ Implementation
    ⑥ Paper prototypes or storyboards