OMSCS Human-Computer
6750 Interaction

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Assignment P2 (Spring 2021)

Answer the following prompt in a maximum of 8 pages (excluding references) in JDF format. Any content beyond 8 pages will not be considered for a grade. 8 pages is a maximum, not a target; our recommended per-section lengths intentionally add to less than 8 pages to leave you room to decide where to delve into more detail. This length is intentionally set expecting that your submission will include diagrams, drawings, pictures, etc. These should be incorporated into the body of the paper unless specifically required to be included in an appendix.

If you would like to include additional information beyond the word limit, you may include it in clearly-marked appendices. These materials will not be used in grading your assignment, but they may help you get better feedback from your classmates and grader.

Question 1 (from Lesson 2.3): ~1.5 pages

Some time during the week, select a one-hour period to be particularly cognizant of the tasks in which you are engaging. During this hour, **compose** a list or table of the tasks that you are performing, the goals associated with that task, the interfaces with which you interact to perform those tasks, and the object (that is, the thing you are manipulating or transforming from input into output) of your interactions. Note that you have leeway in determining the scope you're considering for your task; for example, one person might think of "Emptying my inbox" as a task, while another might think of "Responding to this email" as a task. We would expect you to come up with at least 5 tasks (and their associated goals, interfaces, and objects), and we would expect them to be relatively different from one another (e.g. your five tasks shouldn't be "Answer this email", "Answer that email", "Answer the other email", "Answer another email", and "Answer yet another email").

Note that for many of these, your interface may not be computational; for example: if your task is driving a car, then the goal would be getting to your destination, the interface would include the steering wheel, gas, and brake pedals, and the object of your task would be the car itself. If your task was adjusting the radio in the car, then the goal might be to find a certain song, the interface would be the knobs and dials on the radio, and the object would be the music currently coming out of the system.

The one-hour period you select should <u>not</u> be an hour you spend driving because (a) we've used that example to illustrate the assignment above, and (b) please don't work on homework while driving.

Then, for **four** of the sets you came up with (task, goal, interface, and object), **discuss** the level of directness and invisibility of the interaction. In terms of directness, how far is your interaction from the object of the interaction? To what extent are you directly manipulating the object rather than manipulating it at a distance through the interface? In terms of invisibility, how much time did you spend thinking about the interface rather than the task? If you focus mostly on the task, did the interface become invisible through learning or through good design? Was there a time when you thought more about the interface than you did now?

> **Hint:** We say "carve out an hour" because the challenge with identifying invisible interfaces is often that we take them for granted. By being very deliberate for a predetermined set of time, we hope you can focus more on the tasks that you might not even consider that you do because they've become *so* invisible and automatic.

Question 2 (from Lesson 2.3): ~1.5 pages

Select an task (besides driving) that you do on a regular basis that has become invisible by learning; that is, an interface that you used to spend a lot of time thinking about, but now ignore in favor of focusing on the task. Feel free to choose a task you perform that does not currently have a computational interface (such as a cookbook and thermometer or hand-written spreadsheet).

First, **describe** the components of the interface you used to think about a lot. Then, **describe** your thought process now, and especially **explain** why you no longer have to spend as much time focusing on the interface. Finally, briefly **describe** how you might design or redesign the computational interface to get you to the point of invisibility more quickly.

> **Hint:** This question is best-suited for an interface with which you are now an expert despite some early difficulty. Many video games demonstrate this type of learning curve, as do many pieces of software for complex tasks. You may also think outside the box: perhaps you used to struggle with cooking or budgeting, but have since gotten better.

Question 3 (from Lesson 2.4): ~1.5 pages.

In the lectures, we discuss three types of human perception that are commonly used in user interface design (visual, auditory, haptic).

First, select one of the following five task domains:

- Using an advanced treadmill or exercise bike, including heart monitoring, calorie-counting, rate variation, etc.
- Cooking a meal, including using the various appliances and utensils
- Playing a video game, optionally including games in virtual or augmented reality
- Using a smartwatch to navigate a route as a pedestrian
- Playing with an infant's discovery toy, such as this one

Using your chosen task domain, **describe** how **each** of these three types of human perception are used to give the user feedback.

Then, for **each** type of these three types of human perception, **design** how that type of perception could be used to give feedback about something (within your chosen task domain) that does not currently use that modality. For example, what kind of haptic feedback might you give a player in a game? What kind of visual feedback might you give a person on an exercise bike? Make sure to design features that *you* haven't seen before, but don't worry if the feature actually does exist on a device you haven't seen before.

Finally, briefly **name** a different kind of human perception outside these three, and **describe** one way it is or could be used for feedback in your chosen task domain.

> **Hint:** Here's a list of other senses besides the five we recognize most commonly. Remember, you do not need to focus exclusively on feedback designed into the interface. You could instead discuss feedback that is inherent to the task: for example, if this question was about driving a car, the driver can feel the car itself turning in response to movements to the steering wheel.

Question 4 (from Lesson 2.4): ~1.5 pages

In the lecture, we give five suggestions for reducing cognitive load in interface design: using multiple modalities, letting the modalities complement each other, giving the user control of the pace, emphasizing essential content while minimizing clutter, and offloading tasks from the user onto the interface.

Select two of these tips. For **each** tip, **select** an interface from your everyday life that violates the suggestion. Briefly **describe** the interface, and then **describe** violation of the tip. Then, briefly **redesign** the interface to incorporate the tip into its design.

> **Hint:** If you're stuck, try thinking of an interface that currently follows the tip, and then try to brainstorm a similar interface that does not follow that tip. Be cautious with the fifth tip: if you aim to automate a significant part of the task, then you should focus on the interaction between the user and the interface that triggers the task and captures the user's input rather than how the task is actually automated.

Submission Instructions

Complete your assignment using JDF, then save your submission as a PDF. Assignments should be submitted to the corresponding assignment submission page in Canvas. You should submit a **single** PDF for this assignment. This PDF will be ported over to Peer Feedback for peer review by your classmates. If your assignment involves things (like videos, working prototypes, etc.) that cannot be provided in PDF, you should provide them separately (through OneDrive, Google Drive, Dropbox, etc.) and submit a PDF that links to or otherwise describes how to access that material.

This is an individual assignment. All work you submit should be your own. Make sure to cite any sources you reference, and use quotes and in-line citations to mark any direct quotes.

Late work is not accepted without advanced agreement except in cases of medical or family emergencies. In the case of such an emergency, please contact the Dean of Students.

Grading Information

Your assignment will be graded on a 20-point scale coinciding with a rubric designed to mirror the question structure. Make sure to answer every question posted by the prompt. Pay special attention to bolded words and question marks in the question text.

Peer Review

After submission, your assignment will be ported to Peer Feedback for review by your classmates. Grading is *not* the primary function of this peer review process; the primary function is simply to give you the opportunity to read and comment on your classmates' ideas, and receive additional feedback on your own. All grades will come from the graders alone.

You will typically be assigned three classmates to review. You receive 1.5 participation points for completing a peer review by the end of the day Thursday; 1.0 for completing a peer review by the end of the day Sunday; and 0.5 for completing it after Sunday but before the end of the semester. For more details, see the participation policy.