HCI 351 - Lab Assignment Questions

*Q1. Use both the following HCI Devices and integrate these devices with any three real time available applications like VLC media player, Picasa, MS office, paint etc. and define two gestures to control two specific functionalities of that particular application.*

*a) Kinect*

*b) Leap Motion*

*c) Even you can choose your own HCI device such as alexa, google carboard, and so on instead of any one of these devices (Prior permission should be taken before you start the assignment)*

*Q2. Analyze whether the HCI tool integrated application follows the Shneiderman’s Eight Golden Rules of Interface Design and Norman’s Seven Principles (Explained by Mr.Tushaar in the class). Rules and principles are given below for your reference.*

Shneiderman’s Eight Golden Rules of Interface Design

1. Strive for consistency in action sequences, layout, terminology, command use and so on.

2. Enable frequent users to use shortcuts, such as abbreviations, special key sequences and macros, to perform regular, familiar actions more quickly.

3. Offer informative feedback for every user action, at a level appropriate to the magnitude of the action.

4. Design dialogs to yield closure so that the user knows when they have completed a task.

5. Offer error prevention and simple error handling so that, ideally, users are prevented from making mistakes and, if they do, they are offered clear and informative instructions to enable them to recover.

6. Permit easy reversal of actions in order to relieve anxiety and encourage exploration, since the user knows that he can always return to the previous state.

7. Support internal locus of control so that the user is in control of the system, which responds to his actions.

8. Reduce short-term memory load by keeping displays simple, consolidating multiple page displays and providing time for learning action sequences.

Norman’s Seven Principles

1. Use both knowledge in the world and knowledge in the head. People work better when the knowledge they need to do a task is available externally – either explicitly or through the constraints imposed by the environment. But experts also need to be able to internalize regular tasks to increase their efficiency. So systems should provide the necessary knowledge within the environment and their operation should be transparent to support the user in building an appropriate mental model of what is going on.

2. Simplify the structure of tasks. Tasks need to be simple in order to avoid complex problem solving and excessive memory load. There are a number of ways to simplify the structure of tasks. One is to provide mental aids to help the user keep track of stages in a more complex task. Another is to use technology to provide the user with more information about the task and better feedback. A third approach is to automate the task or part of it, as long as this does not detract from the user’s experience. The final approach to simplification is to change the nature of the task so that it becomes something simpler. In all of this, it is important not to take control away from the user.

3. Make things visible: bridge the gulfs of execution and evaluation. The interface should make clear what the system can do and how this is achieved, and should enable the user to see clearly the effect of their actions on the system.

4. Get the mappings right. User intentions should map clearly onto system controls. User actions should map clearly onto system events. So it should be clear what does what and by how much. Controls, sliders and dials should reflect the task – so a small movement has a small effect and a large movement a large effect.

5. Exploit the power of constraints, both natural and artificial. Constraints are things in the world that make it impossible to do anything but the correct action in the correct way. A simple example is a jigsaw puzzle, where the pieces only fit together in one way. Here the physical constraints of the design guide the user to complete the task.

6. Design for error. To err is human, so anticipate the errors the user could make and design recovery into the system.

7. When all else fails, standardize. If there are no natural mappings then arbitrary mappings should be standardized so that users only have to learn them once. It is this standardization principle that enables drivers to get into a new car and drive it with very little difficulty – key controls are standardized. Occasionally one might switch on the indicator lights instead of the windscreen wipers, but the critical controls (accelerator, brake, clutch, steering) are always the same.

*Q3. Incorporate any one among affective, cognitive, groupware, ubiquitous computing, groupware virtual reality, augmented reality in the existing application used for previous question.*

**Note:** (a) These assignments/exercises should be performed by three students in a group.

(b) Students in a group should not use these HCI devices simply as a mouse pointer but they are supposed to define a particular gesture for each functionality such as volume control, play pause, add/remove sub titles, minimize/maximize windows for VLC media player etc.

(c) Every week (in HCI Lab) the students in a group must show any one assignment for evaluation otherwise zero marks will be considered.

(d) All the devices will be handed over to the CR he should distribute these devices sensibly. The students group should get the device in time and the group should not miss the deadline for the evaluation otherwise zero marks will be considered.

(e) Choose the Applications which are most suited for every HCI device as mentioned in Question 1.

(f) TAs already worked on these devices. You can take their suggestions.