**ITIS 6400/8400 Principles of Human Computer Interaction**

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**CA05 – Interface Modalities**

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In the context of human–computer interaction, a **modality** is the classification of a single independent channel of sensory input/output between a computer and a human. A system is designated uni-modal if it has only one modality implemented, and multimodal if it has more than one. Multiple modalities can be used in combination to provide complementary methods that may be redundant but convey information more effectively. Modalities can be generally defined in two forms: human->computer (input) and computer->human (output) modalities.

**Part 1:**

* **Design a version of the game of Tetris which you can play just having the features of the modality you are given**
* **Sketch or describe how you’d do the commands to play, how you’d handle the output, any other features you might need to play the game**
* **Try to take advantage of the modality’s benefits to make your version of the game more exciting**
* **Write down several benefits of using that modality**
* **Write down several disadvantages or things that were challenging with that modality**

Description of the intended system: The system allows the user to interact with the game using voice input commands and gives resultant feedback using visual aids. The system may provide complimentary feedback on achieving each successful stage in the game. The time to think and act is faster when the user interacts with the system using voice, as compared to when he tries to perform the intended operation using the tangible interface. This makes the system more comprehensive as there is no need to understand the interface of the system and rendering is faster. Trailing are a set of commands that will be employed to design and develop the intended system driven by above features:

Commands: Voicing out move the block right by some many places or all the way.

Voicing out move the block left by some many places or all the way.

Voicing out move the block down by some many places or all the way.

Voicing out rotate the block to the left by so many degrees.

Voicing out rotate the block to the right by so many degrees.

More Exciting and Good to have features using modality’s benefits: The more exciting part with this system is it makes you feel as if you are involved in to the game. As you are focussing only on voicing out in the game rather than hands it yields quicker and better results. The game will voice out “ROW CLEARED!” whenever a row is fully cleared. Then when the user loses the game by having the blocks stacked so high it touches the top it voices out “LOSER!”. Another great feature is when the block is not what the user needs he/she can shout out skip to save the block for later use.

Advantages: By talking through more exact movements of each blocks.

Talking will be faster than using fingers or hands to push the buttons.

Don’t need to know each of the different button functionality.

The brain can allow for faster reaction with talking through commands rather than touching buttons.

Disadvantages: Might be used to using your hands to navigate and use the system.

The noises or sounds from the games could cause performance issues, especially in multi-player environment.

The different pronunciations or accents could cause confusion with commands.

It would be more enjoyable with tangible interaction.

May involve the need the use of additional peripherals like microphone and speaker for the system to function effectively.

**Part 2**: Fill out the following matrix comparing various input/output types. Use general words, such as high or large, low or small for ratings.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Command Line (Linux)** | **WIMP**  **(Mac OSX,**  **Windows) with keyboard and mouse** | **Speech Input and Output**  **(Alexa, SIRI)** | **Touch**  **(tablets, phones)** | **Air Gesture**  **(Kinect)** |
| **Time/effort to learn how to perform new commands?** | High | Low | Low | Low | Low |
| **Speed of use, once trained?** | High | High | High | High | High |
| **Flexibility, Power? (Can you do anything?)** | High | High | Low | High | Low |
| **How much screen space is required?** | Low | High | Low | High | High |
| **How much information can be conveyed to the user?** | Larger | Larger | Small | Large | Small |
| **Are errors likely? Can users easily recover?** | High | Low | High | Low | High |
| **Other considerations? (Pros/Cons)** | Pro: Faster speed once learned  Con: Need to know many commands | Pro: The interaction with the system  Con: Requires a larger screen | Pro: Does not require touch  Con: Not very flexible | Pro: Select functions with fingers  Con: Requires finger movements | Pro: Requires little time to learn  Con: Moving the wrong way could cause false movements |