CS3483 Multimodal Interface Design Project

Topic:

1. Project objectives
2. **Overview of the Computer Helper**
3. **Multimodal interaction features** 
   1. Posture Detection

Posture detection will help detect whether the user's posture while using the computer is correct. After activating the system, the system will use the front camera of the computer to detect the user's posture with live capture. The system will determine whether the monitor is at the user's eye level or slightly below eye level and whether the shoulders are aligned with the user's ears and ankles. A good posture while using a computer is that the monitor is at or slightly below the user's eye level, the shoulders should align with the ears, ankles, hips, and knees. The system will monitor the user's posture nonstop to help the user maintain a good posture while using the computer.

* 1. Distance Detection

This feature is designed to help users keep a safe viewing distance and maintain healthy habits by monitoring the user's distance from the screen in real-time and providing advice. After the user activates the system, the system will use the webcam to capture a live video feed of the user. A face detection algorithm identifies the user's face in the video frame in order to find out the pixels of the users' face which are used for calculating the user's distance from the screen. Optimum distance between the user and the monitor is predefined as 50cm, if the distance is more than 50 cm, a warning will be given in order to remind the user to adjust the distance. The system will continuously monitor the user's face width in pixels and calculate the distance in real-time.

* 1. Speaker

An alert sound will be played out to alert the user for his/her unsuitable posture, the distance between the monitor and the user themselves/, or when the user uses the computer for too long. Once the user activates the system, it automatically connects to the speaker. This is done to remind the user to change his/her posture, keep an appropriate distance from the monitor, or stay away from the computer for a while.

* 1. Mouse Keyboard Input

This feature is primarily used for monitoring user's typing speed in real-time and providing suggestions for improvement. After system is activated, system will tracks every press made by the user and each keystroke is recorded with a timestamp to calculate the typing speed.The system apply algorithms to calculate the words per minute (WPM) and display the WPM in real-time in the system window in order to allow user acknowledge the average typing speed. Also this feature helps to track the typing duration for users and provide reminders. If the usage of typing to too long, reminder message for user to take a rest will be popped-out.