APPENDICES

Assignment 1: Modules of the project, the students are developing

Module 1: The Training Module - In this module, the user is asked to select an object and register it in the database. The selected object is further required for specifying and performing the gestures. After selecting the object, it is required to perform and store the gestures. So the user performs the gestures and the software stores them in the central repository as a gesture. Then a specific Windows OS operation is assigned to the gesture by the user which concludes the training module.

Module 2: The Detection Module - In this module, the user performs a gesture with the selected object in the first place. The system then tracks the point trajectory of the object and tries to identify the gesture. If the performed gesture is found then the system enters in the third module, the Operational Module else, the system specifies the user that the given input gesture is not valid and asks him to perform the gesture again.

Module 3: The Operational Module - After the gesture has been identified by the system, the next thing to do is to perform the associated operation. In order to perform the operation, the software uses Windows API calls and activates some of the processes.

Assignment 2: Why given option is chosen?

According to the current market research, the gesture input systems currently in use are Leap Motion and Sony Viao Gesture Input. Both of them have certain drawbacks such as Leap Motion requires an external hardware device and is too costly. Also it works only a specific number of applications, known as the "AirSpace" apps, which is a software market for Leap Motion.

The Sony Viao Gesture Input is the other alternative, but the biggest drawback is that it works only on Sony Viao devices. Also the gesture recognition is not so precise.

As seen from these, our approach of using a custom object for input of gestures and performing general Windows OS operations using it is a completely new one. Also the system uses OpenCV libraries provided by EMGU, which is an open source repository for computer vision related APIs and software systems. As a result of which, most of the resources are readily available.

Assignment 3: Domain Specific Analysis

In software engineering, domain specific analysis is the process of analysing related software systems in a domain to find their common and variable parts.

The main domains of our software include image processing and computer vision. Computer vision is the field of computer engineering that include methods for acquiring, processing, analysing and understanding images and in general produce high-dimensional data and symbolic information. Sub domains of computer vision include scene reconstruction, event detection, video tracking, object reconstruction, learning, motion estimation and image restoration.

The main methods we are using are video tracking and object recognition.

Video tracking is the process of locating a moving object or multiple objects over time using a camera. The main uses of video tracking include Human-Computer Interaction, which is the main focus of our project.

Object recognition is the task of finding and identifying objects in an image or a video sequence, which is used in our project for detection of the user-specific customizable object.