Requirements Gathering Report

1. **Aim**

The overall main objective of this research is to find out if a gesture based interface will improve usability of an asynchronous video communication system for deaf users. We want to investigate whether using an interface that can be controlled using hand gestures will make it easier for deaf users to communicate with each other without having to physically be in contact with a computer. In this experiment we want to get feedback about the usability and how to improve the current system that has been developed for the Deaf users at DCCT.

2. **Method**

Six Deaf users from DCCT participated in the experiments and 4 users were asked to use the current asynchronous video communication system for about 5 minutes. The other 2 Deaf users were asked to use synchronous video communication system for 5 minutes. Afterwards the two groups where then asked to switch and the users who were using the asynchronous system switched to synchronous system and vice versa.

Users where allowed to ask questions and also give comments when they were using the two systems. After using both systems users where asked if they think converting the current systems to use hand gestures for input instead of using a mouth and keyboard will improve the usability of the system. Users were also asked to give suggestions on what can be improved on the current system or suggest any functionality that can be added to the system. They also had to come up with any hang gestures they think will be appropriate for the different functions in the system.

3. **User Feedback**

Most users thought that a gesture based interface would make the system usable but some users didn’t think it is a good idea especially on the synchronous system since there isn’t much to do after the conversation has started. The option available is to end conversation on the synchronous system once you start a conversation but on asynchronous they thought gestures will makes things easier since they have to keep on recording, sending and playing incoming video.
They had issues on what kind of gestures should be used between simple hand gestures like just raising your hand up as compared to a proper sign that actually mean something in sign language. They would prefer to use a sign that has a meaning but the system should also be able to distinguish between a sign in a conversation and a sign which is a command to the system in order to perform a certain operation. There was also a suggestion to come up with new signs that are not part of the sign language for the different functions but they couldn’t agree on certain signs which posed as a bigger problem as some users didn’t think it was a good idea.

The use of a touch screen was among some of the suggestions made and all users thought it would be much more easier to have a touch screen as users just select the option they want on the screen without having to use a mouse. The touch screen did not really solve the problem that users actually have to stop signing to each other and move forward to actually touch the screen as they usually have to sit at a reasonable distance from the webcam which is mounted on top of the screen. When using a touch screen users will still have to move forward like before when they were still using a mouse but with gestures there is no need for that as they can just continue on signing. With a gesture interface they just have to switch between hand gestures for the conversation and gestures used to control the system and they don’t even have to move from where they are currently sitting.

They were several suggestions and comments made on the current systems which included the following:

- They suggested that labels on the system should be changed to words that are easy to understand. The current system uses words like “Capture” for starting to record a video and “Transmit” to send the video. Words like record and send were suggested as alternatives.

- The current system makes use of buttons with labels only and there are no icons, so users thought the use of icons will make the interface more user friendly and it will be much easier to determine what the different functions are used for.

- The system should also give feedback and notifications clearly after completing an operation. The current system writes messages at the bottom of the interface in black and in a small font for notifying users of new messages and confirmations of sent messages.
The interface should represent these notifications and confirmations much better in a way that can easily be noticed by the users.

The asynchronous system uses two windows of video with one window for viewing the other user and the other for viewing yourself so users suggested having one big window which shows the other user and a small video window at a corner within the bigger window. This would be similar to the synchronous system which uses this approach which looks like a small picture on top of a bigger a picture.

If the gestures used to control the system form part of the sign language and can be part of a conversation the system should have a certain designated area within the video window where gestures will be detected and all the other areas are used for conversation. Gestures used to control the system will only be considered if they are within the designated area whereas if there are not they are regarded as part of the conversation.

They also suggested combining both the asynchronous and synchronous video communication system to one system. The system could also support text communications thereby allowing users to switch between the 3 different communication methods.

Deaf users would like a working prototype instead of a paper prototype as they don’t really get how things work in theory. They actually want to interact with the system in order to fully understand what is going on how to actually interact with such a system.