

Design Of Communication Aid for Physically Challenged

Ranjitha.D¹, Rajeswari.J², Ragasumidha.G³, Mrs.Pradeepa.S(Asst.Prof.Dept.Of.IT)⁴
Computer Science and Engineering, Adithya Institute of Technology
Email: ranjideva24@gmail.com¹, rajikrishnan94@gmail.com², ragasumidha10@gmail.com³

Abstract- In our project we proposed to develop an Android Application for deaf people to communicate with other people normally. The Sign Languages are used, which were generally used by the deaf people in their conversation. Here the Speech-to-Sign and Sign-to- video technology are implemented. Initially, the Sign language is typed by the deaf person on one end of communication side and which is later converted into video on other end of communication side. This is achieved with Video Relay Service (VRS - enables audible language translation on smart phones with signing) technologies which can convert the sign language into video. When the speech signal is received as the response then it will be converted into sign language video. By using this application deaf person can easily interact with normal person anywhere, and he can also use this application for mobile sign translation using VRS. To achieve our project we combine variety of technology which is integrated into single part. Thus our project enables an easy way of specially abled people communication with other people in a normal way of role.

Index Terms- Keyword-Speech-to-sign technology, Video Relay service, mimix application, Outfit-7 Application.

INTRODUCTION

Before SMS/MMS, deaf people rarely used mobile phones. Now texting allows deaf people remotely to communicate with both deaf and hearing parties. Mobile video chat may one day replace texting, but only for conversations between deaf callers, not for those between deaf and hearing callers. Outfit-7 application for our mobile phone, with an image movement who will repeat everything we say in a high-pitched voice. Without dialing number we can use this application.

1. GOAL OF THE PROJECT

The goal of this project is to determine gesture recognition that might enable the deaf to converse with the hearing people remotely and is done by a JSON interpreter. We are not aware of any research which aim is to provide un-intermediated mobile communication between deaf and hearing people, each conversing using their own natural languages. Hence our project has provided the idea of implementing communication between deaf and hearing people in day-to-day life. Initially, mobile search functionality must recognize either ASL (American Sign Language) Text or voice and convert it to both text message as well as video for relevant input. ASL2TXT enable sign language finger spelling communication (signs displayed in the keyboard) take text and display video.

1.1. Deaf-hearing communication

Though not all deaf Americans use sign language, for ease of exposition, we define the term “deaf” broadly, to include any person who communicates primarily using American Sign Language (ASL). Similarly, we follow Gallaudet University’s Editorial Style book; we do not capitalize the word, “deaf”. Though some hearing people use both audible and sign languages, we use the term “hearing” to suggest a person who speaks in audible language and does not sign. One exception when referring to a paid professional who intermediates Communication between deaf and hearing parties, we use the term, “interpreter.” Technical literature uses the term “translation” in favour of “interpretation,” so we follow that standard for that reason.

1.2 Sign language interpreter

Sign language interpreter is responsible for helping deaf or hearing impaired individuals understand what is being said in a variety of situations. An interpreter must understand the subject matter so he or she can accurately translate what is being spoken into sign language. Whenever an audience will be in need of sign language interpretation, a sign language interpreter is needed, such as during an office meeting, in a court room or at a presidential speech. Interpreters may also be used in one-on-one situations; they might use technology to provide services from a remote location.

There are mainly two parts

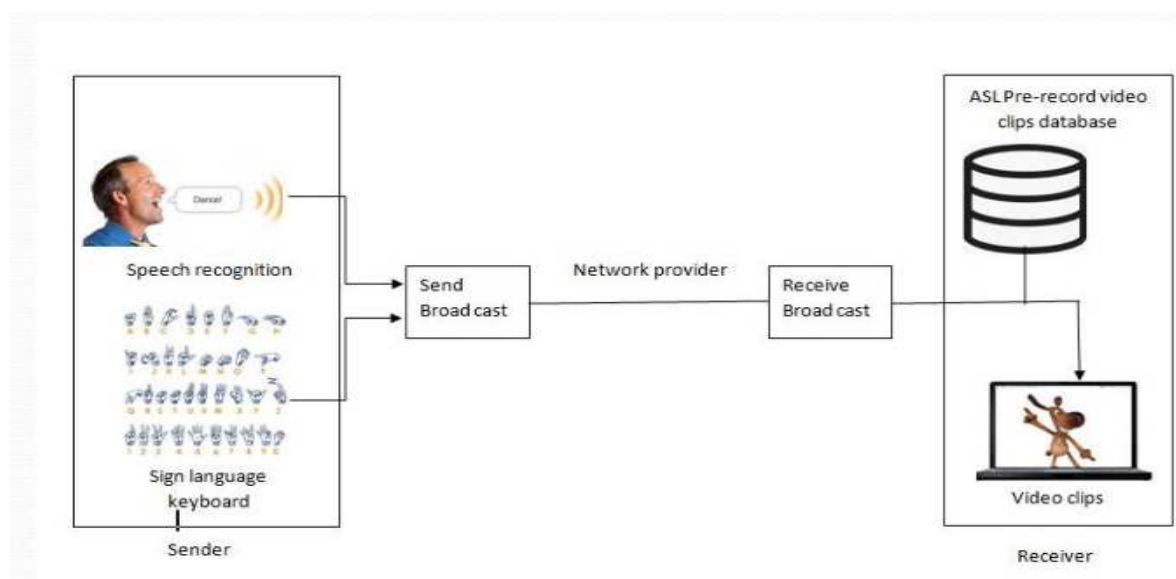
- Speech-Recognition
- Recognized Text

SR system clustered according to three categories:

- [1] Isolated vs. continuous
- [2] Speaker dependent vs. Speaker independent
- [3] *Smaller vs. larger vocabulary*

1.3 Video-Relay Service

1.4 Human Interpreters



For lengthy, sophisticated conversations it is difficult to imagine a workable computer system that would improve over human interpreters. The ability of human interpreters to perform language translation may always exceed a computer's ability. From courtrooms to churches, the role of human sign language interpreters likely would not change with or without the existence of mobile ASL2TXT. Still, human translation or relay services may sometimes take more time to establish than a given communication is worth. In some situations, mobile ASL2TXT translation may be more convenient than a relay or even a handwritten note. Like texting, we envision ASL2TXT as an enhancement to smart phones and other mobile devices, not as a replacement for human interpreters.

2. MOBILE PHONES AND TEXTING

SMS/MMS enables signers to communicate with both deaf and hearing parties. Video chat technology continues to improve and one day may be the

VRS allows those persons whose primary language is ASL to communicate in ASL, instead of having to type what they want to say. Because consumers using VRS communicate in sign language, they are able to more fully express themselves through facial expressions and body language, which cannot be expressed in text. A VRS call flows back and forth just like a telephone conversation between two hearing persons. For example, the parties can interrupt each other. VRS calls may be made between ASL users and hearing persons speaking either English

preferred means of mobile communication among the deaf. Researchers at the University of Washington are developing Mobile ASL to improve video chat capabilities on smart phones. This image compression research clarifies video, improving small-screen mobile communication among the deaf. It does not address communication between deaf and hearing callers.

3. RELATED WORK

We are aware of no research whose aim is un-intermediated mobile communication between deaf and hearing people, each conversing using their own natural languages. However, research abounds in related areas.

3.1 Speech-To-Text Translation

Computers already translate audible languages. Google Translate allows users to type text in their native tongues and receive textual and audible translations in several vernaculars. Dragon Dictation

types what the user vocalizes into text messages, Face book and Twitter. Talk to Me translates input text or speech back and forth between 40+ audible languages, outputting text and/or speech.

3.2 Asl Dictionaries (TEXT-TO-ASL)

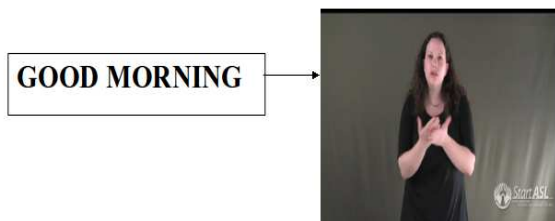
Video of ASL is available at various websites, such as ASL Pro Michigan State University's ASL Browser and Signing Savvy. Users access video by typing their text-string identifiers. ASL2TXT requires a reverse ASL Dictionary, one which allows users to gesture signs, then read text translations, or listens to audio translations.

3.3 Sign To Text (OR) Sign Recognition

Second module comprises the Sign Language input, which is displayed as the keyboard on the mobile screen. American Sign Language (ASL) is the predominant sign language of deaf communities in the United States and most of anglophone Canada. ASL signs have a number of phonemic components, including movement of the face and torso as well as the hands. ASL is not a form of pantomime, but iconicity does play a larger role in ASL than in spoken languages. English loan words are often borrowed through fingerspelling, although ASL grammar is unrelated to that of English. ASL has verbal agreement and aspectual marking, and has a productive system of forming agglutinative classifiers. Many linguists believe ASL to be a subject-verb-object (SVO) language, but there are several alternative proposals to account for ASL word order.

3.3.1. Sign Language Recognition

Last module of our project comprises of the main Sign Language Video. This video is displayed on the deaf party side. Sign Language video is obtained from the JSON and the Hand Speak websites. These websites includes most of the words from the ASL Dictionary. For Example: The below picture represents the meaningful video for the deaf people in the sign language. Good Morning is displayed in the video as follows:



The sign language recognition can be implemented through our project by giving a link to the particular

web server. Intent can be used implicitly to get the video as the output in the users mobile phone. The request is given to the server and is hit to the server with get/post method, where the output is received as the String and converted to the video.

Typeset sub-subheadings in medium face and capitalize the first letter of the first word only.

4. FEATURES OF THE PROJECT

- Without dialing number we can communicate to other like face to face communication.
- It does not require large amount of storage as it uses the Hand speak support through online.
- The sign words are signed in the same order as letters appear in English alphabets.
- This project prepares individuals to work as interpreter/translators facilitating and mediating communication between Deaf/Hard of Hearing and hearing people.
- Accurate and appropriate transfer of a message from a source language into a target language from the point of view of style and culture
- Learn the culture and history of Deaf people to better understanding communication between Deaf and Hearing individuals.
- This application is perfect for sending messages you would otherwise be too shy to say in person, like apologize to someone, profess love or sing a song.

4.1. Storage And Speed Issues

A mobile search system may sometimes require a database larger than the capacity of a given mobile device. It may be preferable at times to go to the cloud for image search, analysis and translation into text/voice, depending on the processing power of the mobile devices, the resolution of the images and the size of the vocabulary database. However, satisfactory results have already been reported. As stated in "Mobile visual search is ready for Prim time."

4.2. Experimentation And Application

System development must begin by testing image processing algorithms and pattern recognition methods against a broad set of images from a library of digital sign language gestures. This must be performed not only in laboratory conditions but in real-world environments under various lighting conditions. The evolution of the proposed system proceeds with translating finger-spelling the alphabet and continues through ever more complicated ASL gestures. While in the short term we may not achieve a full-fledged dictionary, the initial tool may be useful in situations that utilize only character sets (finger-spelling) or

small sets of input words, such as a GPS system in an automobile.

4.3 limitations Of Existing System

- (a) It can be used only between the caller and Callie.
- (b) For communication between deaf and hearing person we must dial the number.
- (c) For daily activities that are for normal face to face communication we cannot use this application.

4.4. MIMIX Application

How easy is it for a deaf and hard hearing person to communicate with others? Today a new option is available for them and for you to enjoy a conversation with each other it's a new app called Mimix. Anything a person will say is immediately translated to sign language through Mimix making it easier to have a clear, two-way communication with a deaf without having to know sign language. It works based on recorder.

4.4.1 limitations In MIMIX Application

In this Mimix application the limitation is to convert the normal language into sign we first record the sentence the by clicking convertor button it convert to sign language.

- For every sentence the recording is necessary to record the sentence.
- By cause of this it takes time. Hence to overcome this we must access the application without recording that is nothing but to access directly.

5. PROPOSED SYSTEM

Our proposed system includes a variety of technologies. It consist two main parts hardware and software. In hardware parts we required phone, speaker. In software we mainly consist outfit-7 (which is used in tomcat application)and Video Relay Service(VRS). All these parts can be brought together in an integrated system. In this system we implement outfit-7 in VRS application.

5.1 Outfit-7application

It is an application for our mobile phone, with an image movement who will repeat everything we say in a high-pitched voice. Without dialing number we can use this application.

5.2 Origin

“Outfit7” is the creator of the series, which was founded on October, 2009. They created the first mobile application and the very first application of the Talking Friends series “Talking Tom”, a 3D cat, on June 26, 2010 .

5.3 Process Flow

5.3.1. ASLA-TO-TEXT

First, mobile search functionality must recognize video images. Storing and processing this information might begin with the following procedure Press record button. Gesture sign language. Press stop button. Press translate button. Output perhaps would be a text string, which may not be meaningful in English, but would correlate with the gesture. Call this identifier “ASL text” (ATXT), distinct from English text (TXT). ATXT may be analogous to verbal contractions of audible languages, as “did not” is sometimes pronounced, “didn’t.” Video images and their corresponding ATXT may be stored in a database which may reside on the smart phone, or tablet PC, or on the web. Alternatively,feature descriptors other than ATXT may be used.

5.3.2 ASL TEXT-TO-TEXT

Second, ATXT must be translated into TXT. This process will require continuing enhancement as similar gestures have quite different meanings. For example, the ASL gesture for “Friday” is the same as the letter “F,” except that the former moves in a circle for a brief time while the latter is relatively still and may be almost instantaneous. Video processing will analyse multiple images, not only for the content of the image but also for its relationship to previous Image. Volga and Golden stein exposit many of the issues involved in this process. The output of this process would text which could be translated to speech.

5.3.3. TEXT-TO-VOICE

Third, display to the hearing person the English text (TXT) and play the audible vocalization (VOC). This is accomplished with existing text-to-speech technology. These first three steps complete one direction of a conversation,from gestured ASL to audible speech. Together they comprise a reverse ASL dictionary, as described in 3.3. A system consisting only of ASL2ATXT, ATXT2TXT and TXT2VOC may provide a useful standalone system for looking up the meanings of gestures. The next three steps comprise the responding direction of the conversation. A primitive system for converting from audible speech

to ASL gestures would have two parts, speech-to-text followed by text-to-ASL.

5.3.4 VOICE-TO-TEXT

The hearing person could reply vocally or textually. To convert VOC to TXT, the computer would use speech recognition, i.e., speech-to-text.

5.3.5. TEXT-TO-ASL TEXT

Then translate TXT into ATXT. This step presents substantially the same challenges.

5.3.6 THE AMERICAN SIGN LANGUAGE (ASL) ALPHABET

All letters are signed using only the right hand which is raised with the palm facing the viewer so a straight finger is will normally point upwards. When fingers are folded they point down across the palm. When the thumb is folded it crosses the palm towards the little finger. In these descriptions left and right are from the position of the viewer. In the case where the hand is turned or tilted the positions of the fingers is described first for an upright hand and the turn or tilt is added.



Fig . ASL Alphabet

5.3.7 SIGNED ENGLISH (SE)

- SE is a reasonable manual parallel to English.
- The idea behind SE and other signing system parallel to English is the deaf people will learn English better if they are exposed. Visually through signs, to the grammatical feature of English.
- SE uses two kinds of gesture
- Sign Words
- Sign Markers.
- Each Sign word stands for a separate entry in a Standard English dictionary.

- The sign words are signed in the same order as words appear in an English sentence. Sign words are presented in singular, non-past form.
- Sign Marker is added to these basic signs to show. For example that you are taking about more than one thing or that something has happened in the past.
- When this does not represent the word in mind, the manual alphabet can be used to finger spell the word.
- Most of signs in SE are taken from ASL. But these signs are now used in the same order as English words and with the same meaning.

5.3.8 COMBINATION OF OUTFIT-7 AND VRS

Instead of tomcat in this we take an avatar image through which a hard of hearing person can easily understand. In this step if we combine both Mimix and outfit with VRS service then the process time is reduce it does not require any recorder at each time it convert into sign directly without recorder.

6. PROPOSED SYSTEM COMMUNICATION

6.1 Advantages

- It does not require opening recorder each time like Mimix. Without dialing number we can communicate to other like face to face communication. Record any sound and play it back with a filter. The sound is recorded and erased after the play back. It does not require large amount of storage. Record a short video and then send it as a text message (SMS), Facebook message, Kakao Talk message etc. We can also share our video by posting it on Facebook or Twitter.
- This application is perfect for sending messages you would otherwise be too shy to say in person, like apologize to some one, profess love or sing a song... You can even create your own funny video story.
- Tom's Messenger is by far the easiest and fastest way to send a message... You don't even need to type.

6.2. Feature Description

In future important journals include Mimix, outfit-7 and VRS on speech and audio processing, Computer Speech and language. It involves both speech recognition and translation components. By using this application deaf person can easily interact with normal person anywhere.

- Automatic translation
- Automotive speech recognition
- Speech-to-sign transmission

7. MODULE DESCRIPTION

- Login
- Sign to Text (or) Sign Recognition
- Access ASL Dictionary
- Sign Language Recognition

7.1 LOGIN

This module is used to help the user to install the application in their mobile phones. Once the user installs the application it asks the user to enter their user name, password and confirm password. If both the password matches the user registration gets successful now the user is taken to the page where the



ASL keyboard is displayed.

7.2 SIGN TO TEXT (OR) SIGN RECOGNITION



This keyboard is represented using Signed English (SE). The pattern of representation exhibits each letter of English Alphabet in its Hand Signs. These alphabets are used by the user to communicate with the normal people as a messaging service. When the

deaf user sends the message to the hearing party, it is received as text message on the other side.

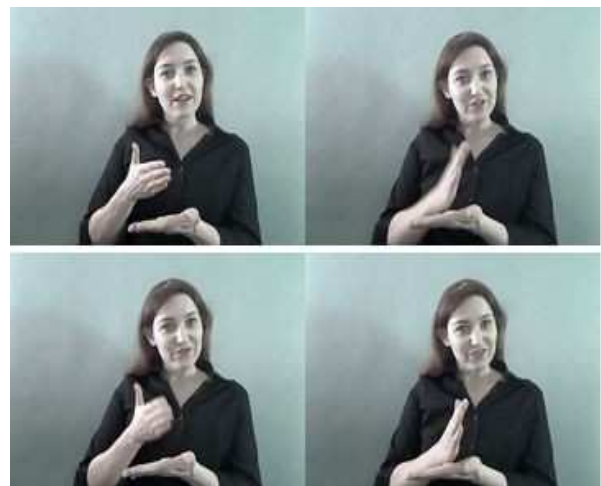
7.3 ACCESS ASL DICTIONARY

AL RIGHT →



ASL is a complete, unique language meaning that it not only has its own vocabulary but its own grammar that differs from spoken English. (Seeing Essential English) SEE-II is not a separate language but rather a system to communicate in English through signs and finger spelling. The vocabulary of SEE-II is a combination of ASL signs, modified ASL signs, or unique English signs. The reason SEE-II signs vary from ASL is to add clarity so that the exact English word meant for the conversation is understood.

7.4 SIGN RECOGNITION



Last module of our project comprises of the main Sign Language Video. This video is displayed on the deaf party side. Sign Language video is obtained from the JSON and the Hand Speak websites. These websites includes most of the words from the ASL Dictionary.

8. CONCLUSION

Short-term, ASL2TXT might enable sign language finger-spelling communication in narrowly defined environments. A simplistic system, which used SEE

(Signing Exact English) instead of ASL, might take text then find and display video as described. While primitive, such a system may yield functionality at least on par with Stephen Hawkins's cheek-twitch controlled, IR-sensor driven voice box. Medium-term, ASL2TXT may facilitate brief mobile communication between deaf and hearing parties. This would represent a giant leap forward in deaf-hearing communication. Long-term, ASL2TXT, augmented by speech-to-text, might enable both hearing and deaf callers to intercommunicate using their natural languages. It is difficult to estimate the effect of such a tool in terms of integrating deaf and hearing people into one society. By using this application deaf person can easily interact with normal person anywhere, and he can also use this application for mobile sign translation using VSR and by using UTF-7 he can communicate in daily activates without dialing number.

REFERENCES

- [1]Ed Burnette, "Hello, Android" , Introducing Google's Mobile Development Platform,3rd ed., The PragmaticProgrammers, 2010.
- [2]Jennifer Moranz , Peggy Anne Salz ,The Everything Guide to Mobile Apps: A Practical Guide to AffordableMobile App Development for Your Business
- [3]http://educationportal.com/articles/Sign_Language_Interpreter_Job_Description_Duties_and_Requirements.html
- [4]<http://www.healthyhearing.com/content/articles/Technology/Wireless/50160-The-best-phone-apps-for-video-relay>
- [5]<https://play.google.com/store/apps/details?id=me.mimix.roid&hl=en>
- [6]<http://www.googblogs.com/uncategorized/outfit-7s-talking-friends-built-on-google-app-engine-recently-hit-one-billion-downloads/>
- [7]<http://www.deafblind.com/asl.html>