



SIGN LANGUAGE RECOGNITION FOR DEAF AND DUMB PEOPLE USING ANDROID ENVIRONMENT

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ABSTRACT

This paper helps the deaf and dumb person to communicate with the rest of the world using sign language. Communication plays an important role for human beings. Speech-to-sign technology and VRS enables audible language translation on smart phones with signing and application has characters feature in mobile without dialling number uses a technology that translates spoken and written words into sign language with video. Interaction between normal people with blind person is very difficult because of communication problems. There are many applications available in the market to help the blind people to interact with the world. Voice-based email and chatting systems are available to communicate with each other by blinds. This helps to interact with persons by blind people. This work includes a voice based, text based and video based interaction approach. Video chat technology continues to improve and one day may be the preferred means of mobile communication among the deaf. Technologies not mashed up to solve the problem of mobile sign language translation in daily life activities. Video interpreter is responsible for helping deaf or hearing impaired individuals understand what is being said in a variety of situations. The main feature of this work is that it can be used to learn sign language and to provide sign language translation of video for people with hearing impairment.

Keywords: Speech Recognition, Sign Language, Speech Translation.

1. INTRODUCTION

Android application have shown a dramatic improvement in their functionality to a point where it is now possible to have cellular phone execute Java programs. As a result, cellular users throughout the world are now able to read and write email, browse web pages and play java games using their cellular phones. This trend has promoted as to propose the use of android application for better communication. 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 hearing callers, not for those between deaf and hearing callers. Outfit-7 is an application in which an image movement will repeat everything we say in a high-pitched voice. Without dialing number we can use this application.

This paper deals an alternative for gesture detection using image processing technique between deaf people which overcomes the above technique and paves the way for the communication between deaf and normal people in their daily activities using sign language and video relay service. Video technology continues to improve and one day may be the preferred means of mobile communication among the deaf. It allows deaf, hard-of-hearing and speech impaired individuals to communicate over video or other technology with hearing people in real-time, via a sign language interpreter. The idea behind SE (Signed English) and other signing system parallel to English is the deaf people will learn English better if they are exposed.

The sign language provides video by improving small-screen mobile communication among the deaf. There are mainly three parts:

- Speech-Recognition Engine
- Database and
- Recognized Text

Under Speech- Recognition Engine we include Sign to Speech with the help of outfit – 7 and Video Relay Service (VRS - enables audible language translation on smart phones with signing) technologies and Speech to Sign using Mimix technology. Secondly, SQL lite database is used to store the inputs given by the application user which are then viewed from the database. Finally, Text (or video) recognized through Mimix makes it easier to have a clear, two-way communication with a deaf without having to know sign language. It works based on recorder. This feature, along with the power of JSON (Java Script Object Notation) which establishes it is a great choice for incorporation in the proposed architecture.

The main goal of this paper 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.

The process abounds the following:

- A deaf person signs
- Software translates signs into text (and video)
- The hearing person reads it (and view it)
- The hearing person and deaf people speaks into microphone
- Software translates voice into text (and ASL video)

- The deaf person reads it (and sees ASL video)

1.1 Features of the work

- 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 paper 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 app 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.

1.2 Domain Introduction

1.2.1 Deaf-Hearing Communication

Since all deaf are not using sign language in their day to day life, for ease of exposition, we define the term “deaf” broadly, to include any person who communicates primarily using American Sign Language (ASL). 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. Technical literature uses the term “translation” in favor of “interpretation,” So we follow the standard for that reason.

1.2.2 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. Interpreters may also be used in one-on-one situations; they might use technology to provide services from a remote location.

1.2.3 Open Standard

It allows deaf, hard-of-hearing and speech impaired individuals to communicate over video or other technology with hearing people in real-time, via a sign language interpreter. The video interpreter facilitates communication between the participants who are located together at the other site. The JSON format was originally specified by Douglas Crockford. JSON or JavaScript Object Notation, is an open standard format that uses human-readable text to transmit data objects consisting of attribute–value pairs. It is used primarily to transmit data between a server and web application, as an alternative to XML. Although originally derived from the JavaScript scripting language, JSON is a language-independent data format. Code for parsing and generating JSON data is readily available in many programming languages.

1.2.4 Video-Relay Service

Deaf callers can also contact hearing parties through interpreters using mobile video chat through smart phones, tablet PCs, or iPods with Wi-Fi connection, but these solutions still require human interpreters. But in to overcome this Free sign language resources and extracurricular materials for language enthusiasts, ASL students and learners, instructors and teachers, interpreters, homeschoolers, parents and professionals who are interested in learning how to sign language online and/or beyond classes for practice or self-study. This is achieved by using the resource hand speak implemented along with the JSON technique. 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.

1.2.5 Texting and Speech Translation

SMS/MMS enables signers to communicate with both deaf and hearing parties. Video chat technology continues to improve and one day may be the preferred means of mobile communication among the deaf. Google

Translate allows users to type text in their native tongues and receive textual and audible translations in several vernaculars.

1.3 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. Hence in some situations, mobile TXT2ASL translation may be more convenient than a relay or even a handwritten note. Like texting, we envision TXT2ASL as an enhancement to smart phones and other mobile devices, not as a replacement for human interpreters.

2. LITERATURE SURVEY

The purpose of the Literature Survey is to give the brief overview and also to establish complete information about the reference papers. The goal of Literature Survey is to completely specify the technical details related to the main project in a concise and unambiguous manner.

In different approaches have been used by different researchers for recognition of various hand gestures which were implemented in different fields [1]. The whole approaches could be divided into three broad categories

- Hand segmentation approaches
- Feature extraction approaches and
- Gesture recognition approaches.

All the available systems are not portable and not affordable to poor people. This paper introduces new android application which will detect the Indian sign language via mobile camera and converts into corresponding text or voice output. Now our system provides 65% of correct predicting and we are working on improving its efficiency. Hence we took the idea of implementing the gesture video with the help of hand speak technology which helps the deaf people to view their relevant sign language video based on the text given as input. We include the idea of providing the link to the application which helps in extracting the video. It proves its maximum efficiency.

Sign language is used as a communication medium among deaf and dumb people to convey the message with each other [2]. In order to

bridge the gap in communication among deaf, dumb community and normal community, lot of research work has been carried out to automate the process of sign language interpretation with the help of image processing and pattern recognition techniques. This paper proposes optimized approaches of implementing the famous Viola Jones algorithm with LBP (Local Binary Pattern) features for hand gesture recognition which will recognize Indian sign language gestures in a real time environment. An optimized algorithm has been implemented in the form of an android application and tested with real time data. This implemented algorithm is not a robust and real time. Hence we are using the already recorded video stored in a cloud storage which is considered to be the easiest way of interpreting the users input in relevant manner. This above algorithm does not prove its efficiency in any sort of background but our project overcomes this issue to the larger extent.

A number of developing countries continue to provide educational services to students with disabilities in "segregated" schools. Also all students, regardless of their personal circumstances, have a right of access to and participation in the education system, according to their potential and ability [3]. However, with the rapidly growing population and increasing number of people with blindness along with other disabilities, need for use of technology in the field of education has become imminent. In this project, through the use of speech technology, attempts to provide solutions for some of these issues by creating an interactive system. We took the idea of using voice over text technology from the above proposed system because on considering the deaf people, they either have speech ability or be a dumb which again depends on their birth. It will be a revolutionary change that will benefit hearing impaired people, boost their confidence and put them with regular people.

For the past several decades, designers have processed speech for a wide variety of applications ranging from mobile communications to automatic reading machines [4]. Speech has not been used much in the field of electronics and computers due to the complexity and variety of speech signals and sounds. Our speech-to-text system directly acquires and converts speech to text. It can

supplement other larger systems, giving users a different choice for data entry. A speech-to-text system can also improve system accessibility by providing data entry options for blind, deaf, or physically handicapped users. Voice SMS is an application developed in this work that allows a user to record and convert spoken messages into SMS text message. User can send messages to the entered phone number. Speech recognition for Voice uses a technique based on hidden Markov models (HMM - Hidden Markov Model). It is currently the most successful and most flexible approach to speech recognition. Using the speech recognizer, which works over the Internet, allows much faster data processing.

Text-to-speech (TTS) convention [5] transforms linguistic information stored as data or text into speech. It is widely used in audio reading devices for blind people now a day. In the last few years however, the use of text-to-speech conversion technology has grown far beyond the disabled community to become a major adjunct to the rapidly growing use of digital voice storage for voice mail and voice response systems. This paper presents a method to design a Text to Speech conversion module by the use of Matlab by simple matrix operations.

3. SYSTEM ARCHITECTURE

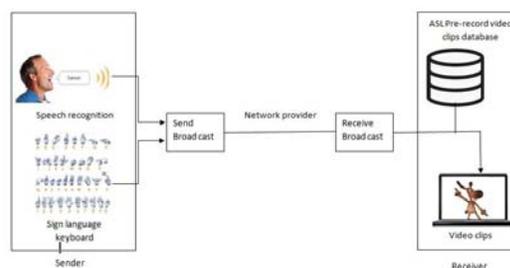


Figure 1. Overall System Architecture

- A deaf person signs through the sign language keyboard displayed in an application as shown in Figure 1.
- Software translates signs into text and ASL video through interpretation process.
- The hearing person read it or view the sign language video extracted through hand speak.

- The hearing person and deaf people speak into microphone which is recognized through Google server.
- Software translates voice into text and ASL video interpreted through JSON (Java Script Object Notation).
- The deaf person reads it and sees ASL video as the sent SMS is stored in the inbox which can be seen at any time.

We have two existing systems,

- Communication through cell (with dialing number)
- Face to face communication (without dialing number).

3.1 Communication through Cell

This happens only between caller and callie as they communicate only through dialling number. When a caller dials the relevant information through text or voice mobile search system require a database larger than the capacity of a given mobile device as it must retrieve the exact information only through cloud. 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 an issue. It can be used only between the caller and Callie. For communication between deaf and hearing person we must dial the number. For daily activities that are for normal face to face communication we cannot use this application.

3.2 Face to Face Communication

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. The 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.

4. PROPOSED SYSTEM

Using this application we paved a way for the deaf person who can easily interact with normal person anywhere. This project also supports Automatic translation, automotive speech recognition, and Speech-to-sign transmission. 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 consider 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 VSR application. Outfit-7 is an application for the mobile phone, with the software, which will convert everything we say in a high pitched voice. Without dialling number we can use this application.

The main important way for communication between deaf has been implemented in our project; it is nothing but ASL (American Sign Language). All letters are signed using only the right hand which is raise with the palm facing the viewer. SE (Sign English) 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. SE uses two kinds of gesture: Sign Words, and Sign Markers.

Each Sign word stands for a separate entry in a Standard English dictionary. In our project we implement the Sign Word concept, which is useful in conversion of Sign Language into words. The sign words are signed in the same order as words appear in an English sentence. 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. 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 dialling number.

5. CONCLUSION

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

dialling number. We can use this application for mobile sign translation using VRS, and with UTF-7 communication can be made without dialling number.

6. FUTURE ENHANCEMENT

In future important journals include Mimix, Outfit – 7, VRS on speech and Audio processing, computer speech and language. It involves both speech recognition and translation components. By using this application deaf people can communicate with normal people anywhere.

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