LITERATURE SURVEY

TOPIC:

Real-Time Communication System Powered by AI for Specially Abled

TEAM:

922119106030-HARIHARAN P

922119106015-BALAJI G

922119106025-DOMNIC VISHAL J

922119106020-DHEENU GOWTHAM S

92219106027-GAJENDRAN B

TITLE:

Literature survey on specially abled.

AUTHORS:

Shrikant Temburwar, Payal Jaiswal, Shital Mande, Souparnika Patil

PUBLICATION YEAR:

Mar –2017

Abstract - One of the most precious gifts of nature to the human race is the ability to express itself by responding to the events that occur in its environment. Every normal person sees, hears, and then reacts to the situations by expressing himself. But there are some less lucky ones who are deprived of this precious gift. Such people, especially deaf and mute, rely on some sort of gesture language to communicate their feelings to others. The deaf, dumb and the blind follow similar problems when it comes to the use of computers. In the era of advanced technologies, where computers, laptops and other processor-based devices are an integral part of everyday life, efforts must be made to make the disabilities in life more independent. Our goal is to design a human computer interface system that can accurately identify the language of the deaf and dumb. With the use of image processing and artificial intelligence, many techniques and algorithms have been developed in this area. Each character speech recognition system is trained to recognize the characters and convert them into the required pattern. The proposed system aims to give speech speechless, a real-time character language is captured as a series of images, and it is processed and then converted into speech and text

of the sign language is an important research problem for communication with the hearing impaired. The system does not require that the hand is perfectly aligned to the camera. The project uses the image processing system to identify, especially the English alphabetical character language used by the deaf to communicate. The system proposed to develop and build an intelligent system that uses image processing, machine learning and artificial intelligence concepts to make visual inputs of hand gestures of sign language and to create an easily recognizable form of outputs

INTRODUCTION Dumb people are usually face some problems on normal communication with other people in society. It has been observed that they sometimes find it difficult to interact with normal people with their gestures. Because people with hearing problems or deaf people cannot speak like normal people, they have to depend on a kind of visual communication in most cases. To overcome these problems, we have proposed a system that uses cameras to capture and convert videos of hand gestures from dumb people who turn into speech for understanding normal people. The primary application for addressing the sign language is the improvement of the sign language. Computer recognition This research makes an Android-based application that can directly interpret Sign language presented by deaf people in written language. Translation process Starts with the detection of hands with OpenCV and translation of and signals The K-NN classification. Tutorial features added in this application with the goal to train intensively to guide the user when using the sign language.

TECHNOLOGIES TO BE USED: 1. Blob Detection: This algorithm helps to draw rectangles around the defective part. The methods aim to detect areas in a digital image that differ in properties, such as brightness or color, compared to surrounding regions. Independent detection of corresponding regions in scaled versions of the same image. A blob is a region of an image in which some properties are constant or approximately constant, all points in a blob can be viewed in a certain sense to be similar to one another.

2. Skin color recognition: Skin detection is the process of finding skin colored pixels and regions in an image or video. This process is typically used as a preprocessing step to find areas that may have human faces and limbs in images.

3. Template Matching: Template matching is a technique in digital image processing to find small portions of an image that match a template image. It can be used in manufacturing as part of quality control, one way to navigate a mobile robot, or as a way to detect edges in images.

METHODOLGY

The methodology follows has following main steps:

1. Generation of the database. Here our system takes the hand movements through the web camera. In this proposed method, 26 combinations of Indian characters are developed by the use of right Hand saved in training database.

2. Image preprocessing and segmentation. The pre-processing takes place on these recorded input gestures. Then the segmentation Hands are performed to separate object and background.

3. Feature Extraction. The segmented hand image is represented with certain features. The characteristics are used for gesture recognition with the template matching algorithm that gives Optimized results.

4. Sign recognition. The given character gesture is recognized with the skin color recognition and the template Matching from the record.

5. Sign to text and Speech conversion. The recognized sign is then mapped into text and further converted into speech With TTS libraries.

6. OVERALL DESCRIPTION: 6.1 PRODUCT PERSPECTIVE: To implement a system for recognizing sign language hand configurations as described which will additionally provide the facility to each individual to define and upload his own sign language into the system since every country or even regional group uses its own set of signs. To develop a tool which will help deaf people in communication. To develop a Sign language, can be translated into text or sound based on images, videos. Signs can be converted to Speech so that there is a two - way communication.

6.2 PRODUCT FUNCTION: It's a Desktop application. User will start video from camera. User will be able to register different signs for further recognition using camera. When user will start recognition activity and give various hand gestures in front of camera, sign will be detected and speech will be produced to announce detected sign.

7. USER CHARACTERISTICS: 1. Systems interface will allow user to start video from camera. 2. User will do different hand gestures in front of camera. 3. User will able to see video, recognized sign on GUI. 4. User will get output in the form of sound which is converted from Speech of recognized sign.

8. CONSTRAINTS: Accuracy of system may vary depending upon light intensity changes. Also accuracy depends upon distance between camera and object.

9. SCOPE: Proposed systems scope is related with education of dumb peoples. Dumb people faces many problems when normal person could not understand their language. They were facing communication gap with normal peoples. For communication between deaf person and a second person, a mediator is required to translate sign language of deaf person. But a mediator is required to know the sign language used by deaf person. But this is not always possible since there are multiple sign languages for multiple languages. So to understand all sign languages, Hand gestures of deaf peoples by normal peoples this system is proposed. System gives output in the form of sound.

CONCLUSIONS The proposed communication system between Deaf and Dumb people and ordinary people are aiming for it when bridging the communication gap between two societies. Several work is done earlier in this area, but this paper adds in complete two - sided communication in an efficient manner because the system is implemented as one Handy mobile application. So, it really serves its needs in all aspects. The above strategies prove to be efficient In terms of time and accuracy. Further improvements can be done in the implementation of the communicator with other sign language such as American Sign Language, Accent recognition for different accents throughout Globe, recognition of emotions in sign language and language Translation

TITLE:

Communication between Deaf-Dumb People and Normal People: Chat Assist.

AUTHORS:

L. Jayatilake, C. Darshana, G. Indrajith, A. Madhuwantha and N. Ellepola

PUBLICATION YEAR:

December 2017

Abstract- Chat applications have become a powerful media that assist people to communicate in different languages with each other. There are lots of chat applications that are used different people in different languages but there are not such a chat application that has facilitate to communicate with sign languages. Sign languages are used by deaf and dump people to communicate among them but those Sign languages vary from nation to nation as American Sign Language, British Sign language, Japanese Sign language etc. The developed system has based on Sinhala Sign language. The system has included four main components as text messages are converted to sign messages, voice messages are converted to sign messages, sign messages are converted to text messages and sign messages are converted to voice messages. Google voice recognition API has used to develop speech character recognition for voice messages. The system has trained for the speech and text patterns by using some text parameters and Signs of Sinhala Sign language is displayed by emoji. Those emoji and signs that are included in this system will pave a new way for the normal people to be more close to hearing disable people and also hearing disable people to be more close to normal people.

INTRODUCTION for years scientists have worked to find a way to make it easier for deaf and dumb people to communicate. Researchers have used image recognition to translate sign language into ‘readable language’ and the tool could one day be used on smartphones. There were some researches about translation of sign language to human readable language. This research was also about finding a proper method to translate sign language to human readable language but in this research, the research team expected to develop a chat application that translates human voice and texts to sign language. This is an android based chatting application that can use anytime anywhere with assist of internet. A sign language is a language which chiefly uses manual communication to convey meaning, as opposed to acoustically conveyed sound patterns. This can involve simultaneously combining hand shapes, orientation and movement of the hands, arms or body, and facial expressions to express a speaker's thoughts. Sign languages share many similarities with spoken languages (sometimes called "oral languages"), which depend primarily on sound, and linguists consider both to be types of natural language. Although there are some significant differences between signed and spoken languages, such as how they use space grammatically, sign languages show the same linguistic properties and use the same language faculty as do spoken languages. Sign languages are different according to the country and nations. The system has developed for Sinhala sign language. The Sinhala Sign Language contains different set of signs and those signs were studied by group member. Voice has translated to the text and then translate to the sign language is another component of this project. That component has

added for make more efficient real time face to face chatting feature to this system. This research not only translates voice and text to the sign language. Totally this research scope was expanded up to four main areas. Those main areas were translating voice to the sign language, translating sign to the voice, translating text to the sign language and translating sign language to the text. Another important aspect of this research was performance and accuracy. The system has focused on voice and text and it was needed to clarify whether voice to sign translation consumes more time. If it does not consume more time, then we needed to research about accuracy of translated sentences and utterances. The main research problem was lacking of any communication media between hard of hearing people and normal people. Accordingly, the identified research questions were how to identify the signs in Sinhala Sign Language, how to design a localized sign language keyboard? How to convert voice or text to the sign language and vice versa. The main objective of this application was, reduce the communication gap between normal people and deaf-dumb people by giving some help to deaf-dumb people to do their works at their convenient and also allowing them to chat with ease by using this tool. The project team searched and found some applications that support some of the functionalities as listed. Examples are Signspeak, V2S, Sign Mobile and Hand Talk. They all were designed for some kind of communication and learning process. There was no chat application to communicate with deaf-dumb people and normal people. Thus, our group has developed an application that can cover the application of all the area of deafdumb people.

LITERATURE REVIEW There are many research have begun carried out in this research area. Oi Mean Foong et al has discussed about sign language translation system using Speech and Image processing technique in “V2S: Voice to Sign Language Translation System for Malaysian Deaf People”[1]. The Advantage is Voice (English Language) to sign language of Malaysia. Main disadvantage is System first needs to be trained with speech pattern based on some generic spectral parameter set. Jonathan Gatti et al have authored “Voice-Controlled Artificial Handspeak System” [2]. Methodology was Prototype. Advantages of this paper robotic hand designed with openSCAD and manufactured with a low-cost 3D printer used, core automation comprises an Arduino UNO controller by a raspberry Pi computer and uses open source speech recognition engine Julius. One and only main disadvantage of this research was robotic hand has its limitations and possible future developments. Tirthankar Dasgupta et al has proposed an application that can be used as an educational tool to learn ISL[3]. This research has used prototype methodology. The system was not only improve information access, but it can also get as main advantage and disadvantages of this research. It was not translate Indian sign language in to the text, system takes only simple English sentences as input, sign synthesis module using an animated avatar has not been developed, and some grammar rules cannot be applied to translate English to ISL, not given clear idea about how system works properly. “Sign Speak: American Sign Language Translation through Sensory Glove.” authored by JanFizza Bukhara, Maryam Rahman, Samna Ishtar Malik, Awaits M. Kamboh, Ahmad Salman [4]. Methodology was to design a glove that would enable deaf and mute people to communicate by translating their sign language gestures into speech according to the American Sign Language, different modules were: glove design, data acquisition system, feature extraction, feature matching, wireless link and android application. There were main two advantages has this research. Those were focused the translation of gestures of the alphabets and also the words, gestures were classified very efficiently and accurately. And also there were many disadvantages. Those were required the user to wear clothes with full sleeves to cover arms. Plus, lighting effects could adversely affect this method, no communication happens between two people, more hardware used (flex sensors, Accelerometer, Contact sensors), only supported Android OS. Dalia Nashat et al has

discussed an android application in “An Android Application to Aid Uneducated Deaf-Dumb People”[5]. Main advantages were, support uneducated DeafDumb people who could not read and write Arabic languages to communicate with others, to learn and to entertain, represent quizzes and games for training deaf and dumb people/kids to identify Arabic and English words, introduce Sign language keyboard. Main disadvantage was, only Support Android OS, no face to face communication happens, educational tool rather than Real world tool, use one sign for the one alphabet. Dr. Sami M.Halawani et al have authored “Arabic Sign Language Translation System on Mobile Device” authored by [6]. Advantages were 3D Animated characters gave more attraction & realistic to the system users, application could work with online & offline. There were more disadvantages. System had not translated sign language in to text, no option of face to face communication, need more database space (Arabic Sign, applications for translating text to sign animation, other external systems or library). Noor Saliza Mohd Salleh et al has proposed “Sign Language to Voice Recognition: Hand Detection Techniques for Vision-Based Approach” [7]. Advantages were, more flexible and useful than prior approach, fast processing. Main disadvantage was video analysis problems. “Sign Language to Speech Translation System Using PIC Microcontroller” authored by Gunasekaran and Manikandan. R [8]. Advantages were, system offered high reliability and fast response, more precised on hand movement, different languages could be installed without altering the code and main disadvantage was high manufacture cost. Sachin Bhat et al has proposed an application on “Translating Indian Sign Language to text and voice messages using flex sensors [9]. Main advantages were, user independent, portable system to convert the sign language to text message form which consumes less power because of the low ultra-power AT89S52 microcontroller was designed, used the simple mobile application and also main disadvantage was higher cost. A. Sujith Kumar et al has discussed mobile chat application on “Sign Mobiles (An android app for especially able People)” [10]. Advantages are enable sign language finger spelling communication, briefly allowed to use mobile communication with face to face chatting, automatic translation and speech recognition. Main disadvantages were large size database was needed to store video clips, mismatch of voice with video clips cannot be handle, it took time to comparing a video clip and voice rather than matching text with signs. A. E. E. El Alf et al has proposed Arabic sign language mobile chat application on “Intelligent Arabic text to Arabic Sign Language Translation for Easy Deaf Communication [11]. Advantages were this knowledge based system has solved number of Arabic language problem such as synonyms, inflectional, derivational, diacritical and plural, allowed finger spelling translation and disadvantages were this system had not allowed to video processing, this system had not translated Arabic language text to Arabic sign language, it was difficult to match grammar rules of Arabic language with Arabic sign language.

METHODOLOGY The research is developed according to the prototype methodology. There was a necessity to run many iterations of the system phases. Therefore prototype methodology was selected to implement this system. Research team identified the research problem firstly. Then the research team gathered requirements about android chat application structures, hardware resources and software resources that were used for develop a chat applications. Then develop the time frame for the system to complete within one year. The initiative states of the system, the research team divided the whole research component into four sub research components. Then the research team researched about Sinhala sign language signs and how those signs were created etc. Then the Gantt chart created that has indicated tasks and allocated time for each task. Then feasibility analysis was done for clarify that this system is feasible for develop to research team. The research group had gone through around twenty research papers and analyzed the details of the similar systems. The research team met a sign

language teacher and had an interview. The information about Sign language words that were gathered in that interview was analyzed. Then research team decided to design emoticons for those signs. The research team needed to observe the idea of normal people about this android chat application.

Then had a survey by creating questionnaires. Around three hundred participants were participate to this survey. 90.9% participants' parentage has given positive response for this project. Therefore the research team was confident to build this application.

CONCLUSION:

The main objective of this research was to implement an android based application for deaf and dumb people to communicate with normal people. One of the area with the greatest potential impact was in the contribution that mobile application can reduce the communication gap between deaf and dumb people with normal people. Recently, communication through mobile phone is considered very important in enhancing better understand in social situation. Even though there are many similar applications are available in the world, most of them do not meet the basic requirements. Some are very much complex, not user friendly and it's difficult for both side understand the application. Most of them don't provide the exact outcome what user wants. The project "ChatAssist" has better solution, it is a simple and understandable chat application, which really suits the deaf people, hearing impaired people and normal people to communicate with each other. The ChatAssist system has four components integrated into a single system, which are Translating voice to the sign Language, Translating sign Language to the voice, Translating text to the sign Language and Translating sign Language to the text. User can choose any chat type to chat with other person.