ASSISTIVE COMMUNICATION FOR BLIND

S Mohammad Asif, Srikanth MM, Sumanth HC,T Munisekhar, Vani Krishnaswamy

School of Computing and Information Technology, REVA University, Bangalore, India
Email: asifshaik471@gmail.com, shrikanthmadar3025@gmail.com, sumanthhc86@gmail.com,
munisekhar74.ms@gmail.com, vanikrishnas@reva.edu.in

Abstract---**One of the foremost precious gifts to somebody's being is a capability to determine, listen, speak and respond in line with the situations. But there are some unfortunate ones who are bereft of this. Making one compact device for people with Visual, Hearing and Vocal impairment could be a tough job. Communication between deaf-dumb and normal person are always a challenging task. This paper proposes an innovative communication system framework for deaf, dumb and blind people in an exceedingly single compact device. we offer a method for a visually handicapped person to read a text and it will be achieved by capturing a picture through a camera and which will be convertedthat text to speech (TTS). The blind people will be ready to read the words using by Tesseract OCR (Online Character Recognition), the dumb people can communicate their message through text which is able to be read out by espeak, the deaf people will be ready to hear others speech from text.**

I.INTRODUCTION

We live in a digital era with advancement in information and communication technology. Sign language is an expressive way of communication between normal and dumb-deaf people so as to enhance the life variety of dumb, deaf and blind people the proposed system is developed.

Approximately 285 million people are visually impaired within the world. during which 39 million are blind
and 246 million have low vision. Blind people can only read Braille script. to enhance the educational process of blind people we've got developed an innovative device for them which capture the image through a camera and convert the image not only into text but also into speech form. By using this device, a blind man can easily be ready to read the text.

About 9.1 billion people are deaf and dumb within the world. They face lots of problem in communication in existence. The deaf and dumb people aren't attached the social world due to their disabilities. Unintentionally, they're treated in an unusual manner by the remainder of the society. language could be a communication skill that's used to convey a meaning of a speaker's thought using gesture. it's a well-structured code gesture; each gesture contains a meaning
assigned to that. The gesture could be a non-verbal communication which incorporates the movement of the hand, and other body Parts. Basically, there's two main language recognition approach namely image- based and sensor based. plenty of research goes on image-based approach due to a plus of no must wear devices like hand gloves and helmet etc. like in sensor-based approach. Gesture recognition is gaining importance in many application areas like human interface communication, multimedia and security.

Normal person face problem in communication with disabled people because they cannot understand linguistic communication. There don't seem to many linguistic communication institutions in our society, So, many of dumb people use usual style of linguistic communication to speak and that they don't have a customized linguistic communication. It is also unfeasible for the masses to find out linguistic communication. Therefore, an oversized communication gap still exists between dumb, deaf and normal people.

Despite the massive number of dumb and deaf people very less research is finished so as to scale back the communication barrier. We propose a system which helps normal and deaf dumb people to effectively communicate with one another. In resolving these difficulties with visually and vocally impaired people. we offer the answer for blind deaf and dumb people by using this device. For blind people, the image is captured using Logitech camera which is converted into text using Tesseract OCR and also the resulted text is converted into speech using espeak which is spelled out by speaker and also the text is additionally displayed. When the dumb people communicating with normal people, the text written by dumb is spelled out by the speaker which might be understandable by normal people. For deaf people the speech is converted into text by employing

a website called speechtexter.com.

In literature survey we have briefly explained about two papers where which are published on the same topic and the advantages and the disadvantages of the papers. In proposed scheme we have explained about our project work flow and overview of our methodology. In the methodology we have explained our project methodologybriefly with the help of flow chart step by step. In results we have given brief explanation about our end product and the last outcome of our project. And lastly, we have given the conclusion and reference papers in the reference in the references section which we have referred for our project.

II.LITERATURE SURVEY

In this chapter we would like to discuss about the authors who have worked on the concepts of converting the text to speech. Few of them are listed below.

The authors in [7] have discussed about designing and implementing Text to Speech converter**.** A Text-to-speech synthesizer is an application that converts text into word, by analyzing and processing the text using toNatural language Processing (NLP) so using Digital Signal Processing technology to convert this processed text into synthesized speech representation of the text. Here, we developed a useful text-to-speech synthesizer within the sort of simple application that converts inputted text into synthesized speech and reads intently on the user which can then be saved as an mp3. file. The event of a text to speech synthesizer is of great help to people with visual impairment and make making through the big volume of text easier.

The authors in [8] have discussed on the brink of design a desktop human computer interface application that's accustomed facilitate communication between normal, "deaf/dumb" and blind people. SVBiComm system helps blind man to listen to voice saying the word gestured by the "deaf/dumb" while the deaf will receive a gesture representing the word said by the blind. SVBiComm works in two directions, the primary direction is processing from video to speech. The animated word gestures are mapped with language mental object into text. Then, the relevant audio is generated using TTS API. The second direction is processing from speech to video. The voice from blind is converted into its corresponding text using Speech-to-Text (STT) API. Then, the tongue is mapped from the database to "deaf/dumb" in an exceedingly relevant language form by employing a 3D graphical model. The advantage of both of those papers is NLP based implementation are high in accuracy whereas it only works for stored samples.

III.PROPOSED SCHEME

In our society there are many people with disabilities. Blind persons can read documents only in Braille Script.The technology is developing day by day but no significant developments are undertaken for the betterment of those people. About nine billion people within the world are deaf and dumb. Communication between deaf and a standard person has always been a challenging task. Linguistic communication helps deaf and dumb people to speak with others. But not all people understand linguistic communication

- ❑ The proposed system consists of:

- ‣ **input** – camera to capture image, keyboard totype a message

- ‣ **output** – speaker and device screen to display the texts and the images.

- ❑ The user can give a reply as a text message and the device does TTS (text-to-speech) conversion, the output is obtained from a speaker.

- ❑ The image is captured through the camera and the reading of a text can be achievedby TTS conversion.

IV.METHODOLOGY

As in our project we are converting text-to-speech or image-to -speech the whole flow of the process is show in Fig1.As shown in the figure we will start the process and then we will chose one function that is image-to- speech or text-to-speech and then the given text or the image is taken as the input and the it will recognize the characters and then forms the sentence and then from that to paragraph. Next paragraph read with the help of text-to-speech function in this we use espeak to convert the text into speech and that will be recorded as the .mp3 file and the file will be played using mp3 player so that the blind people can here to that voice and according to that they can reply for so here made communication easy for the blind people.in the same way the text-to-speech will help for dumb. When a dumb person types his messages, the same text will be taken as the input and the same will be played after converting it into the speech.so that it will help the

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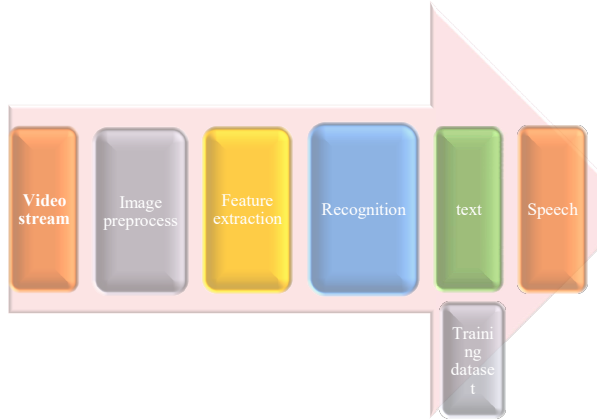**210**

dumb people to convey their message easily.

Fig 1. Block diagram to convert image to speech

when we run the program the camera will be switched on and will capture the image and next it will remove all the unwanted things in image and crops it next it will recognize the characters in the image with help of training dataset it read them and out as .mp3 format file will be played aslike the speech .

Image/Text to Speech using Camera:

Step 1: Start

Step 2: Choose option to convert image to speech

Step 3: Call the function Image-to-Speech ().

Step 4: Capture the required image.

Step 5: Convert image to text using TesseractOCR.

Step 6: Split the text into paragraph.

Step 7: Text is displayed on the screen.

Step 8: Next, call Text-to-Speech () function.

Step 9: Convert text to speech using e-speak synthesizer.

Step 10: Voice is generated.

Step 11: Stop

Fig2.Algorithm to convert image to speech

In this we have given the steps involved in the function which will convert image to speech.

IV. RESULT ANALYSIS

The process is developed for blind those that cannot read normal text. so as to assist blind people, we've got interfaced with the Logitech camera to capture the image by using the OpenCV tool. The captured image is converted to text using Tesseract OCR and save the text to exit.txt. Open the document and split the paragraph into sentences and reserve it. In OCR, the adaptive thresholding techniques are accustomed change the image into binary images and that they are transferred to character outlines. The converted text is read out by the espeak. For blind people, the image is captured using the Logitech camera which is able to be the input for the program as shown in Fig.3. it'll extract text from image and recognize they and it'll be displayed on the screen which is converted into text using Tesseract OCR and therefore the resulted text is converted into speech using espeak which is spelled out by speaker and therefore the text is additionally displayed. After the preprocessing and recognizing the characters this the output we are going to get and it'll be read out with the assistance of the speakers as shown in Fig.4. When the dumb people communicating with normal people, the text written by dumb is spelled out by the speaker which might be
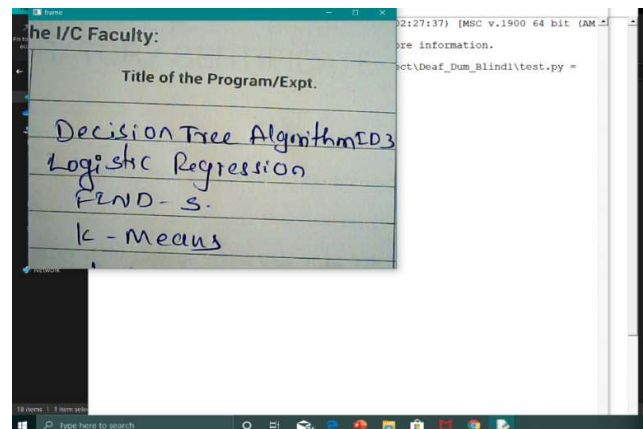
understandable by normal people.

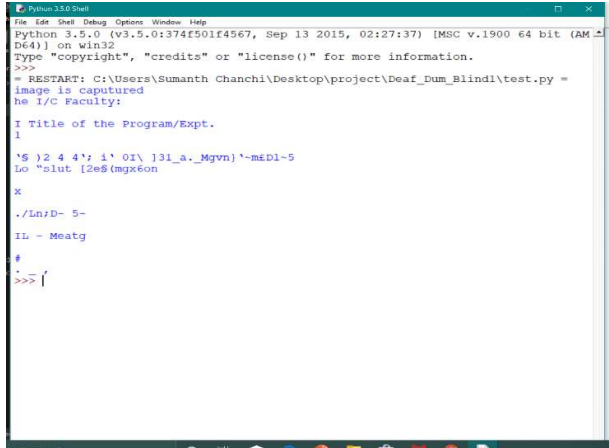Fig3.Capturing Image, here we have captured the image by Logitech camera.

Fig4.Recognition of text and displaying

V.CONCLUSION

In order to resolve this problem for blind users, we've proposed a motion-based method to detect the object of interest, while the blind user simply shows the object for a couple of seconds to the camera. To extract text regions from complex backgrounds, we have used Tesseract OCR to recognize the text and send output to espeak and the output of tesseract OCR will convert text to voice with help of espeak and espeak will give output in .mp3 format and it will be played for blind people. Our future work will extend to process text strings with special characters and to get the proper pronunciation of that character.

REFERENCES

[1] K Naveen Kumar, P. Surendranath & K.Shekar, "Assistive device for Blind, Deaf and Dumb People using Raspberry-Pi", 2017

[2] M Delliraj, "Design of Smart e-Tongue for the Physically Challenged People.", 2013

[3] Fernando Ramirez-Garibay, Cesar Millan Ollivarria, "MyVox—Device for the communication between people: blind, deaf, deaf- blind and unimpaired" ,2014

[4] P. Kumari, S.R.N Reddy ,"PiCam:IoT based Wireless Alert System for Deaf and Hard of Hearing", 2015

[5] R Suganya, T. Meeradevi, "Design of a communication aid for physically challenged.", 2015

[6] L. Anusha, Y. Usha Devi, Implementation Of Gesture Based Voice And Language Translator For Dumb People", 2016

[7] Itunuoluwa Isewon,"Design and Implementation of Text To Speech Conversion for Visually Impaired People",2014

[8] Mariam Moustafa Reda, Nada Gamal Mohammed,"SVBiComm: Sign-Voice Bidirectional Communication System for Normal, "Deaf/Dumb"and Blind People based on Machine Learning ",2018