

MUDRA : A SIGN LANGUAGE INTERPRETER APP

Ms.Anjitha Joy, Mr.Ajin Joseph, Mr.Jaison Mathew, Ms.Riya Rachel Shaji

Mrs.Sneha Thankachan(GUIDE)

Dept of Computer Science, Mar Baselios Christian College Of Engineering & Technology,Peermade,Idukki

Abstract— Communication is the transmission of a message from a sender to a receiver in an understandable manner.As per the census report of india in 2011 about 1.6 millions of people and in the world it is about 460 millions that is 5% of world population is deaf and mute.Sign language is the medium of communication between this deaf and mute community.these peoples convey their messages by the help of movement of hand.Normal peoples cannot understand their grammars.Only trained peoples can understand and easy to communicate with them.

Keywords—Android, open CV,

I. INTRODUCTION

Android is a mobile operating system developed by google,based on a modified version of the Linux kernel.The most of its code is under the Apache License. The Android system lets develop applications in a Java and are running on a Dalvik virtual machine with compilation on execution time.Image processing is a method to convert an image into digital form and perform some operations on it.

II. OBJECTIVE

The main objective of this system is to reduce the communication gap between normal people and the impaired people.They can express their ideas to normal people.There are lots of application was implemented.But they didn't meet all the requirement of impaired people.

Our system uses an Android application. Open Cv (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products.

III. IMPLEMENTATION

Sign language is a boon to impaired people to convey their ideas to the society. In sometimes these people may face many difficulties.Because of this they isolate from the society.The ideas may not understandable to the normal people.To overcome these situation we introduce our system called, MUDRA, A Sign Language Interpreter App.

The proposed system introduces sign language converter using hand gestures recognition that recognize the sign language and convert them to a natural language.The gestures comprises of any gestures made by face or hands. The hand gestures is mapped to its equivalent in natural language and then converted text is sent back to the user device. The system is an Android App.It converts sign gestures into appropriate text on the screen. It is an easy to use and inexpensive approach to recognize single hand gestures accurately. The application uses the camera present in the phone for continuous image capturing and a simultaneous display on the screen. Instead of using external sensors here we are using cameras. This App scans the signs using the camera of the Smartphone. At the time of scanning, it separates background and foreground. Then it changes foreground to white and background to black. Later the operations are performed on foreground. This system will be implemented using client server architecture. On the client machine, there will be an android application which will be used to capture images of the gesture. Once the image is captured, it will be uploaded on the server using the android application. Upon reaching the server, feature extraction of the user-uploaded image will take place.

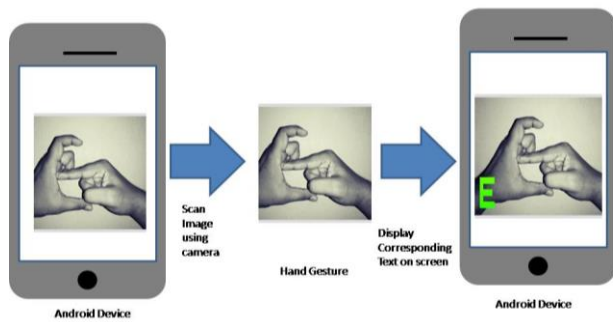


Fig 1: overview of the system.

The above figure shows the conversion of hand gesture to text message. In The android device camera feature is used to capture the gesture. Thus the user can easily use the feature for showing the hand gestures. Later the hand gesture is recognize and it compare with corresponding gesture that stored in the memory. In the database it searches for the corresponding gestures and it outputs a better recognition with great efficiency. Then the corresponding text that consist of the gesture is retrieved from the memory and displayed in the screen.

The figure below represents the System Architecture of our system that basically show each component of the system, how the system works, and the flow of the system and so on. Images that are taken from the web camera goes under preprocessing stages to enhance the feature of an image. Then there is a removal of object and background from the images which later convert into binary form. Feature extraction and reorganization helps to match the images that is stored in database and get the desired output in the form of text and converts that text to speech.

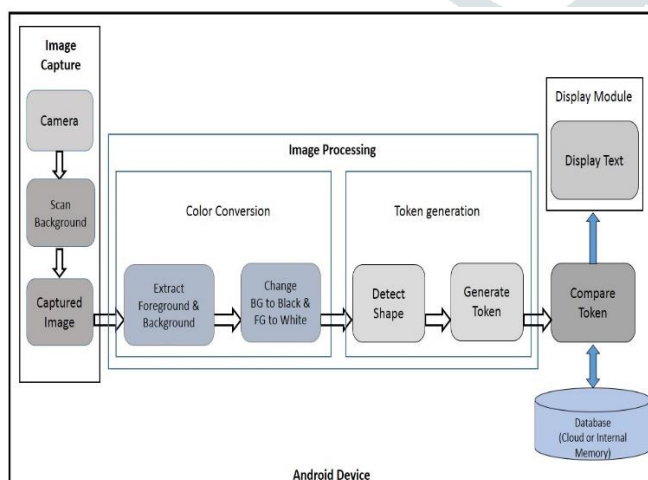


Fig 2 :Architecture of the system

- Training of System

User have to enter number of samples to store in the database. The number of samples should be more than 5 in order to get better accuracy. User have to select the folder where the images will get

saved. Click on start video to open the web camera in order to start the process of database creation. Click capture image to store the number of images in the training folder as per the no. of sample specified. When the number of images will be equal to number of captured image then done storing will get displayed that means database creation is done successfully.

- Image Pre-Processing

The captured images go under pre-processing stage in order to enhance the property of an image. Pre-Processing is basically done to remove the object and background of an image and focus on the hand gestures only. The pre-processed image is then represented in the form of black and white pixels which basically means binarized image.

- Feature Extraction and Recognition

PCA algorithm is used in order to extract the feature of an image. PCA algorithm is applied on the captured images in order to extract the best featured image from the database. PCA converts the images into some independent linear set of variables which refers to the information in the original data which is referred as principal components.

IV. CONCLUSION

There are so many applications were found for impaired peoples to convey their message to others. but these applications never meets all the requirements. So this system helps them. when the impaired person show a gesture it convert to text. so the normal people can easily recognize what they said. This is also a user friendly application. it is used in many areas like gesture controlled robot for physically challenged, gesture controlled doors and vehicles, gesture controlled keyboard and mouse to interact with computer, gesture controlled appliances like air conditioner etc. In future, additional features can be added to it.

REFERENCES

- [1]Deepa Haridas, Drishya M, Reshma Johnson, Rose Simon, Sradha MohanLinu Babu P“Gesture Vocalizer using IoT” DOI 10.17148/IJIREEICE.2017.5424, April 2017
- [2]Mrim Alnfiai, Srinu Sampali, Department of Computer Science, Dalhousie University, “Social and Communication Apps for the Deaf and Hearing Impaired”, 978-1-5386-2752-5/17/\$31.00©2017 IEEE.
- [3]V.Purushotham Vijay Naidu, M.R.Sai Hitesh, T.Dhikhi, “Software assistance to deaf and dumb using handshape algorithm”, Volume 116 No.212017, 371-377

[4] Rucha Ganu, Kunal Kadam, Ankita Bhosekar, Ankita Bhosekar” American Sign Language Interpreter” 978-0-7695-4759-6/12 \$26.00 © 2012 IEEE.

[5]Arslan Arif, Syed Tahir Hussain Rizvi “Techno-Talk:An American Sign Language Translator”978-1-5090-2188-8/16/\$31.00 2016 IEEE

[6]Geethu G Nath , Anu V S,”Embedded Sign Language Interpreter System For Deaf and Dumb People”978-1-5090-3294-5/17/\$31.00 2017 IEEE

[7]Mrs.K.Rekha, Dr.B.Latha,”Mobile Translation system From Speech Language To Hand Motion Language” 978-1-4799-3966-4/14/\$31.00 2014 IEEE

[8]Patil Dikash Y,Jadhav Ashwini A ,Chavan Amruta V,Nikam Shrutika M,”Android Application For Deaf People”,Vol-2,Issue-3,2016,IJIR

[9]Jagdish L.Raheja, A.Singhal, Sadab and Ankit Chaudhary”Android Based Portable Hand Recognition System”,DOI:10.15579/gcsr.vol3.ch1,GCSR Vol 3,pp 1-18,2015

[10] Rupesh Prajapati, Vedant Pandey, Nupur Jamindar, Neeraj Yadav, Prof. Neelam Phadni,” Hand Gesture Recognition and Voice Conversion for Deaf and Dumb”, Volume: 05 Issue: 04 | Apr42018,IRJET.

