A Synopsis on

Interactive and Intelligent Sign Language Converter for specially abled people.

Submitted in partial fulfillment of the requirements
of the degree of

Bachelor of Engineering

in

Information Technology

by

Rikesh Kamra (15104006)

Ankit Gupta (15104004)

Denis Vaghasia (15104020)

Rakesh Sharma (15104017)

Supervisor

Guide: Prof. Kiran Deshpande

Co-Guide: Prof. Vishal Badgujar

Mentor: Prof. Amol Madane

Department of Information Technology
A.P. Shah Institute of Technology
G.B.Road,Kasarvadavli, Thane(W), Mumbai-400615
UNIVERSITY OF MUMBAI
2018-2019

CERTIFICATE

This is to certify that the project Synopsis entitled ***"Interactive and Intelligent Sign Language Converter for specially abled people"*** Submitted by ***"Rikesh Kamra (15104006)", "Ankit Gupta (15104004)","Denis Vaghasia (15104020)","Rakesh Sharma (15104017)"*** for the partial fulfillment of the requirement for award of a degree ***Bachelor of Engineering*** in ***Information Technology.***to the University of Mumbai,is a bonafide work carried out during academic year 2018-2019

(Prof.Vishal B Badgujar)
Co-Guide

(Prof.Kiran B Deshpande)
Guide

Prof. Kiran Deshpande
Head Department of Information Technology

Dr. Uttam D.Kolekar
Principal

External Examiner(s)

1.

2.

Place:A.P.Shah Institute of Technology, Thane
Date:

Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

_____

Rikesh Kamra(15104006)

_____

Ankit Gupta(15104004)

_____

Denis Vaghasia(15104020)

_____

Rakesh Sharma(15104017)

Date:

Abstract

Communication is important as well as very integral part of any working, active and a prosperous action. Without proper communication it is difficult to know everyones liking,hate,comfort, discomfort ,etc and hence makes it difficult to work and process accordingly and hence in a way or two hampers the development of anyone/anything. Some people have hearing and speaking disabilities and hence because of this they are unable to express and communicate in the normal way and express their thoughts/feelings/reviews. These people use Indian Sign language to communicate with everyone but most of people around are unable to understand the Sign language. With the help of this project, we aim to build an application that will be working as a medium or as a translator and translate all the Sign Language to text/audio and vice versa. This application will be using the camera of the mobile device and with which it will record the gestures performed by a person and with help of Image processing these gestures will be converted accordingly and then with the help of Deep Learning these can be then translated properly and the meaning of those gestures will be available in the form of text and audio . Text/audio as input can be converted to sign language as well, with the help of Deep Learning. This application will have a Rich user Interface and easy navigation with plethora of functions, Users will be given full access to learn sign language with help of tutorials provided as well.

Introduction

In daily life each and every human or person express their thoughts, views, needs, complaints by just one medium and that is communication. Communication is the basic medium for exchange of thoughts and as a medium to know other people as well and hence communication lands as very important and should be equal right to each and every human on this earth. Lot of people are unable to keep their points and even express their views on anything because whatever they convey are not understood by many people around. This is because these people communicate with the help of sign language or gestures. Due to this a lot of people feel left out from the society and feel dejected. This not only brings communication gap in the society but also gives these people the thought that whether they equally belong with others. During the research we found out many gesture recognition applications but they were either not updated, slow in conversion, not so accurate or did not translate the required sign language, for example, there is no application which translates Indian Sign Language. So here we bring an application Intelligent and interactive Sign Language Converter for specially abled people that promises to bridge this communication gap and make them feel a part of society, accept their ideas, their thoughts and make this world a better and more comfortable place with equality for everyone. With the help of this project we intend to bridge the communication gap between normal and specially abled people using Indian sign language using a mobile phone which is handy and easily available with most of people. The application will have a Rich user interface and plethora of features and activity available for an user.

Objectives

To create an intelligent and interactive Sign Language Converter that would help and convert all the Indian sign language gestures to text/audio so it can be interpreted by local user and vice versa and to also create a platform where users can come and learn Indian Sign Language

Literature Review

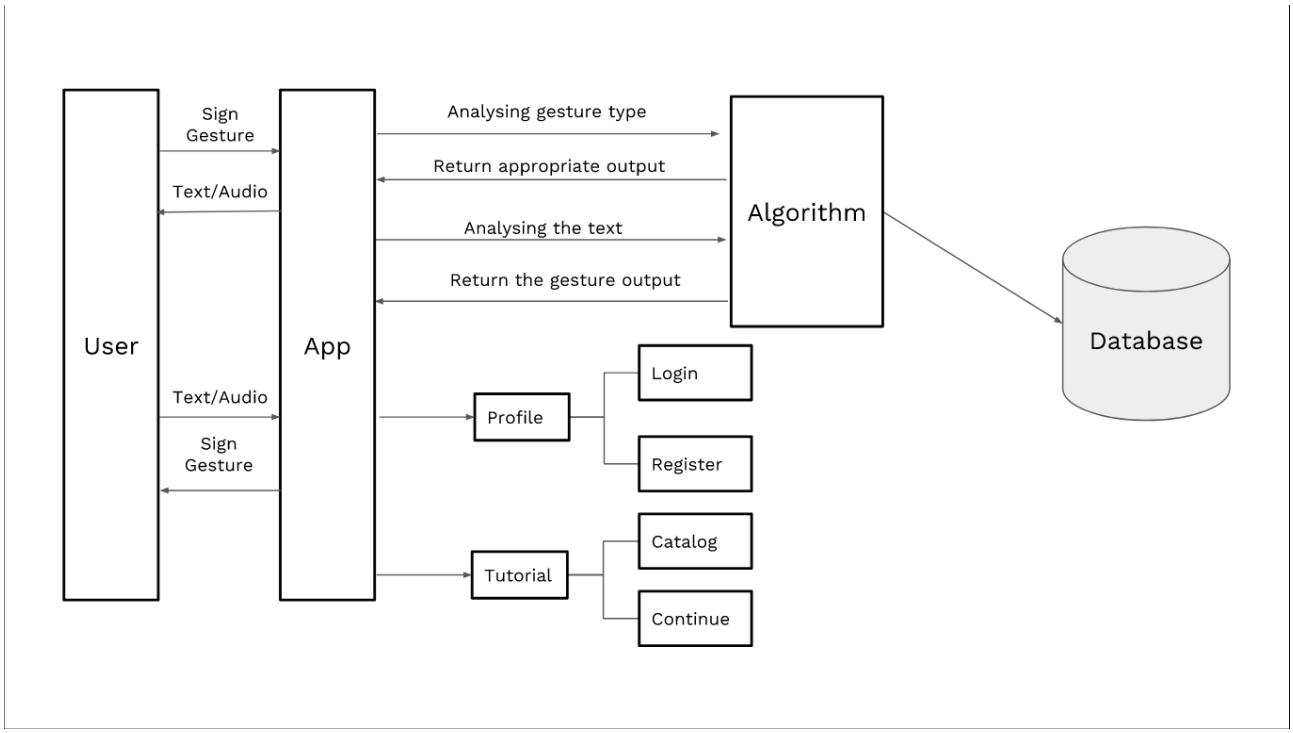
Paper Title	**Aim**	**Merits**	**Limitations**
Real-Time Malaysian Sign Language Translation using Colour Segmentation and Neural Network . IMTC 2007 - Instrumentation and Measurement Technology Conference Warsaw, Poland, 1-3 May 2007.	Automatic sign-language translator provides a real-time English translation of the Malaysian SL.	Using custom made colored gloves makes it easy to recognize the hand positions and hand gestures and also makes it easy to use color segmentation technique	Custom made gloves hinders the natural way of signing.Making gloves for everyone is costly and not feasible.
Spoken language processing techniques for sign language recognition and translation . Human Language Technology and Pattern Recognition, Computer Science Department 6, RWTH Aachen University, Germany, 2008.	A system that recognizes complete sentences in sign language.	Vision based approach which does not require special data acquisition devices	Developing Sign Recognition methods for mobile applications.

Paper Title	Aim	Merits	Limitations
Indian Sign Language Translator Using Gesture Recognition Algorithm. IEEE International Conference on Computer Graphics, Vision and Information Security (CGVIS), 2015.	To develop the application which help the deaf and mute people to communicate efficiently with other people .	Database contain more than the 1,30,000 videos most of the sign gets detected easily **Methods used:** Vision Based Method, YCbCr skin color Approach, Scale Invariant Feature Transform(SIFT)	Since it uses only YCbCr skin color approach it is difficult to understand the sign performed by the people in the low light. Other limitation is that it use SIFT approach to detect and matching of the object which is slower than SURF.
Sign Language Translator for mobile Platform. International Conference on Advances in Computing, Communications and Informatics (ICACCI), 2017.	Developing Sign Recognition methods for mobile applications.	Add gestures in database Recognize the gesture and display the result. Uses all the skin color approach i.e. (RGB, Ycbcr ,HSI) It uses ORB technique.	Since the OpenCV version 2.4.1 is used for computer vision And machine language, which is not much comfortable with android.

Problem Definition

Today we all want to live in a world where at least we can try and convey and explain all our requirements to someone else and get understood. Lot of people are unable to keep their points and even express their views on anything because whatever they convey are not understood my many people around. This is because these people communicate with the help of sign language or gestures. Due to this a lot of people feel left out from the society and feel dejected. We will be using Deep Learning to understand the signs/gesture performed by these users and convert it into strings or etc for others to understand, thus making communication easy and equal for everyone.

Proposed System Architecture/Working



Use Case

Summary

Our application will thus help differently abled people to communicate with other people without ease and successfully bridge the gap between same. Following are the deliverables of our project:

- Gesture to voice/text conversion.
- Gesture learning module.

References

[1] Rini Akmeliawati, Melanie Po-Leen Ooi, Ye Chow Kuang, Real-Time Malaysian Sign Language Translation using Colour Segmentation and Neural Network, IMTC 2007 - Instrumentation and Measurement Technology Conference Warsaw, Poland, 1-3 May 2007.

[2] Philippe Dreuw, Daniel Stein, Thomas Deselaers, David Rybach, Morteza Zahedi, Jan Bungeroth and Hermann Ney, Spoken language processing techniques for sign language recognition and translation, Human Language Technology and Pattern Recognition, Computer Science Department 6, RWTH Aachen University, Germany, 2008.

[3] Purva C. Badhe, Vaishali Kulkarni, Indian Sign Language Translator Using Gesture Recognition Algorithm, IEEE International Conference on Computer Graphics, Vision and Information Security (CGVIS), 2015.

[4] Mahesh M, Arvind Jayaprakash, Geetha M, SIGN LANGUAGE TRANSLATOR FOR MOBILE PLATFORMS, International Conference on Advances in Computing, Communications and Informatics (ICACCI), 2017.