Sign Language Translator

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Abstract

Sign language is used by people who are speaking and hearing disability with uses hand motion. A person with this disability is usually unable to communicate with a person who is unable to understand sign language. It discusses an improved method for sign language recognition and conversion of speech to signs or vice versa. The algorithm devised is capable of extracting signs from video sequences using skin color segmentation. It distinguishes between static and dynamic gestures and extracts the appropriate feature vector.

Introduction

- Communication is the basic form for exchanging thoughts, views, perception and the ideas we think.
- The person suffering from hearing and speaking disabilities knows sign language and whenever they want to communicate with us they do it via gestures i.e. sign language and most of the times we are unaware as to what it means.
- Hence to bridge the gap, we are creating a sign language translator which would not only translate gesture performed by these person and it will convert it into text & audio and also it will convert text/audio from us to sign language.

Literature Review

Paper Title	Aim	Merits	Limitations
[1] Real-Time Malaysian Sign Language Translation using Colour Segmentation and Neural Network	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.
[2] Spoken language processing techniques for sign language recognition and translation	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.

Literature Review

Paper Title	Aim	Merits	Limitations
[3] Indian Sign Language Translator Using Gesture Recognition Algorithm .	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 .
[4] Sign Language Translator for mobile Platform.	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.

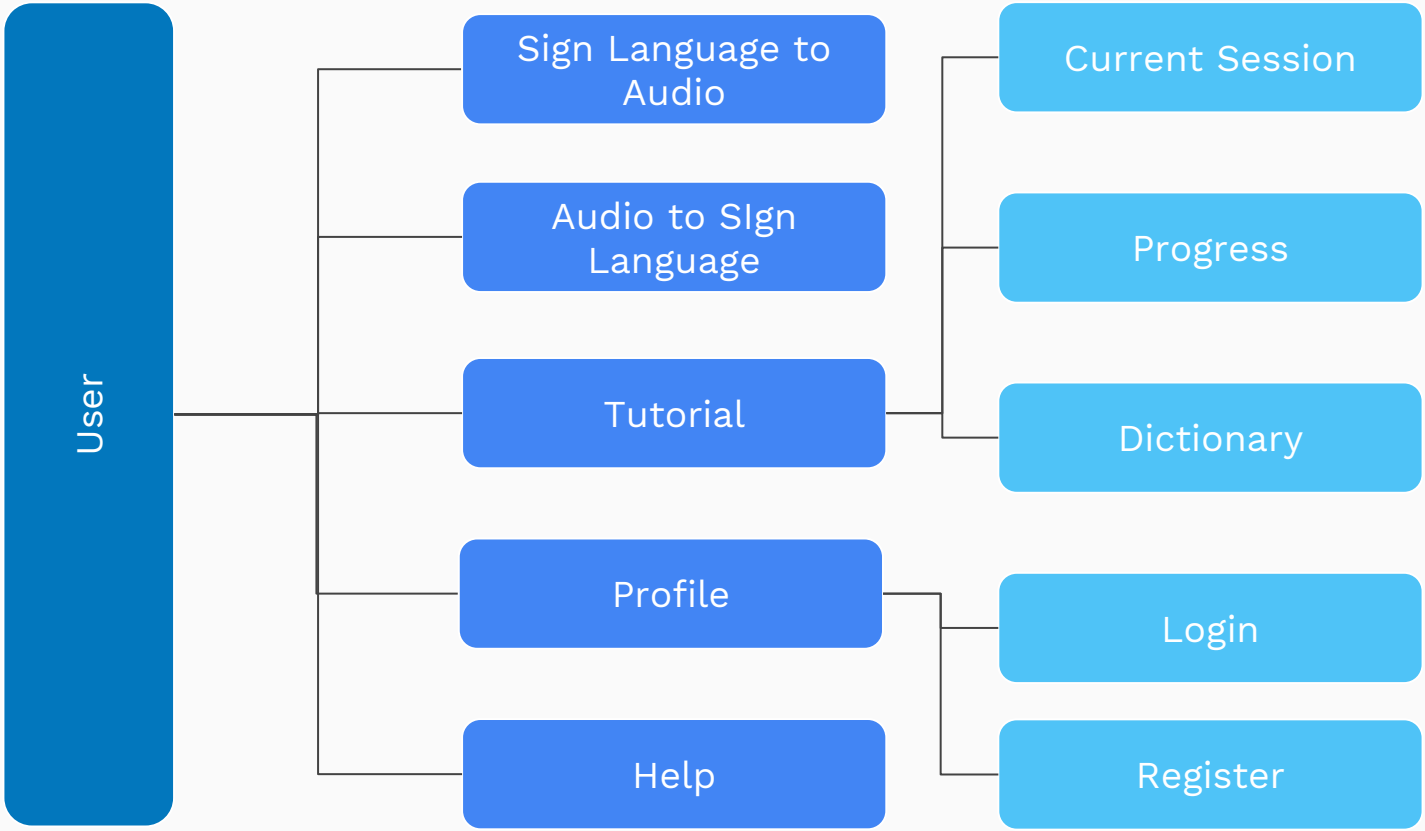
Problem Statement

- 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.
- But is it happening today? 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.

Project Scope

- Can be used in hospitals and railways for emergency and important conversation.
- It can help in Banking sector where employees can have smooth communication with customers.
- Useful for meetings to atleast have basic communication.

Use case Diagram



Project Future Plan

Summary

- Tensorflow lite to train the model for mobile devices
- MongoDB for database
- Skin color segmentation
- Image Processing
- Algorithm search still in process

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.

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THANK YOU!