SIGN LANGUAGE RECOGNITION FOR DEAF & DUMB

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Abstract:

Communication is the main channel between people to communicate with each other. In the recent years, there has been rapid increase in the number of deaf and dumb victims due to birth defects, accidents and oral diseases. Since deaf and dumb people cannot communicate with normal person so they have to depend on some sort of visual communication. Sometimes people interpret these messages wrongly either through sign language or through lip reading or lip sync. This project is made in such a way to help these specially challenged people hold equal par in the society.

INTRODUCTION

The Main challenges that this special person facing is the communication gap between - special person and normal person. Deaf and Dumb people always find difficulties to communicate with normal person. This huge challenge makes them uncomfortable and they feel discriminated in society. Because of miss communication Deaf and Dumb people feel not to communicate and hence they never able to express their feelings. Sign Language Recognition for deaf & dumb (Hand Gesture Recognition and Voice Conversion) system localizes and track the hand gestures of the dumb and deaf people in order to maintain a communication channel with the other people.

EXISTING SYSTEM

In Existing system IOT hand gloves were used, by using hand gloves sensors was used which results in increasing the cost.

PROPOSED SYSTEM

- In proposed system we mainly focus on the cost , so in order to reduce the cost we use Machine learning.
- In machine learning trained dataset was used, while using these exact data output will be displayed and communication is easy.

Methodology:

Step -1 : Take the image as the input from a camera.

Step -2 : Detect the hand gesture which is placed in the Region of Interest(ROI)

Step -3 : Detected hand gesture is feed it to the classifier.

Step -4 : Classifier will categorize according to the getsure.

Step -5 : Based on the accuracy it will find what actually the sign or gesture is representing.

IMPLEMENTATION

OpenCV - For taking the input from the camera.

pip install opencv -python

Keras - To build Convolutional Nerual Network(CNN) model and to train the dataset.

pip install keras

TensorFlow - Keras uses Tensorflow for backend.

pip install tensorflow

Tkinter,PYQT5- For creating GUI application.

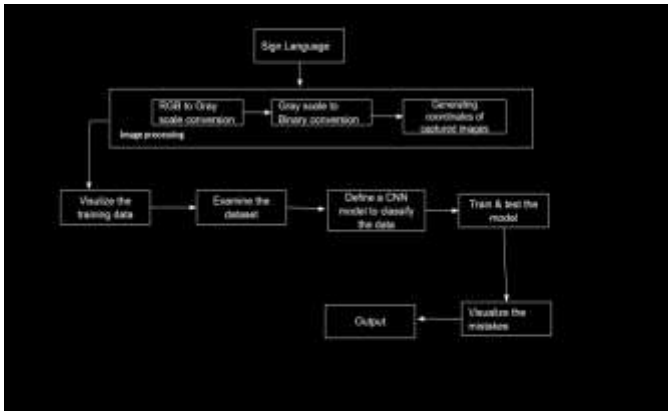
pip install tkinter

pip install PyQt5

Pyttsx3 - offline TTS (text-to-speech)assistance for python

pip install pyttsx3

System Architecture:

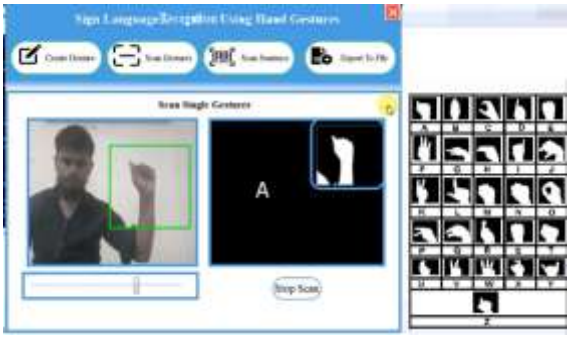


SAMPLE RESULTS

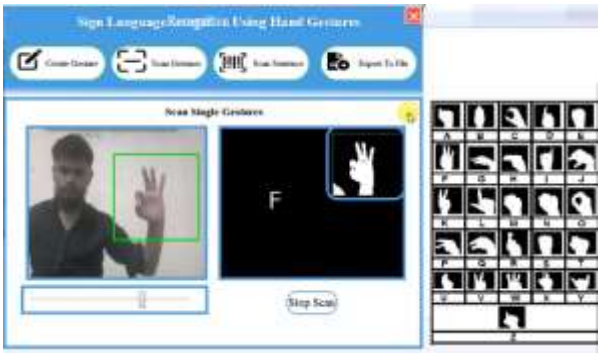
Dashboard with simple gesture animation

Single Gesture

Adjust Camera Light as needed



Placing the hand gestures inside the rectangle box

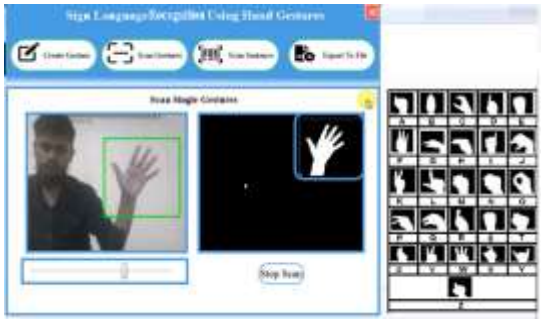


Single gesture Output

Custom gesture generator

Assigning label to the gesture

Gesture saved successfully

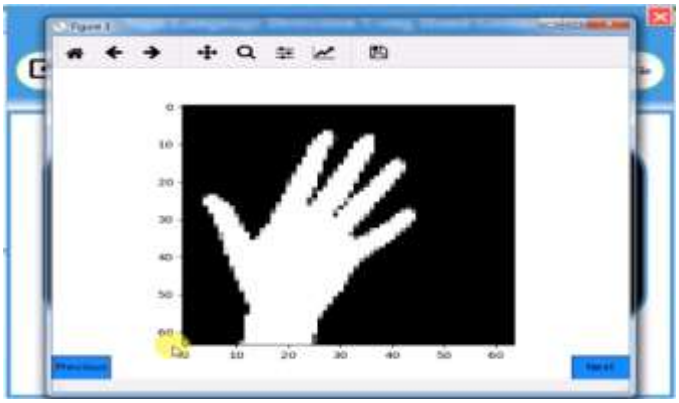


Scanning and testing new generated gesture

Sentence Formation, focusing on the top right window pressing c to form sentence

sentence saved temporarily

Export with TTS assistance and gesture viewer



gesture viewer sample

File saved successfully

No content available

CONCLUSION

Sign language recognition system has been developed from classifying only static signs and alphabets to the system that can successfully

recognize dynamic movements that comes in continuous sequences of images.

With these we can remove the communication barriers between normal people and physical disable persons(deaf & dumb).

Refferences:

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- https://www.quora.com/What-are-some-problems-faced-by-deaf-and-dumb-people-whileusing-todays-common-tech-like-phones-and-PCs
- https://www.nidcd.nih.gov/health/american-sign-language