Hand Sign Interpreter for Speech Impaired People

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Abstract: **In Our areas, Countries and all over the world millions of people are deaf and dumb. So, this people are facing to much problem to share their thought, ideas and knowledge to the normal person. & Normal person also can't understand their feelings. so the Hand sign interpreter play a major role in the daily activities of human life which are helpful for deaf & dumb people to express their thoughts and feelings.**

Keywords: **Hand Sign, Speech Impaired**

1. Introduction

Communication is most important part of human life. Around the world 300 millions of people suffering from disability & maintainability. In the recent year, many number of hearing disabled and speech impaired ratio has risen rapidly due to disease, road accident or birth defects.

A person who is not able to speak or he is lost their ability in accident or faces a very critical issues in communicating his thoughts, knowledge, ideas, feelings to the society so, we understand their issues & design a system called as a Hand sign interpreter for speech impaired people. In proposed system we have made glove, to wearing these glove the speech impaired people are easily communicating with the normal people. This system knows as a sign to voice which is capable of recognizing hand movement by transferring digitized image of hand sign to voice.

Fig. 1. Hand Sign Interpreter

A. Recognition rate

Sign to Voice System Recognition Rate Table 1 given below:

Table 1
Sign to Voice System Recognition Rate

Data	No. of Samples	Recognized Samples	Recognition Rate (%)
Training	50	40	80.0
Testing	20	15	75.0
Total	70	55	78.6 (Average)

B. Performance analysis

Fig. 2. Hand detection

C. Image processing

The input images are captured by a web camera. we have designed our System on detecting the image as part of our image processing. The system is used to capturing a hand image from signer with a webcam setup towards certain angle with black background. The next process will convert the RGB image into grey scale with either black (0) or white (1).

The edge of each object is then computed against the black background. The object can then be segmented and differs greatly in contrast to the Image backgrounds.
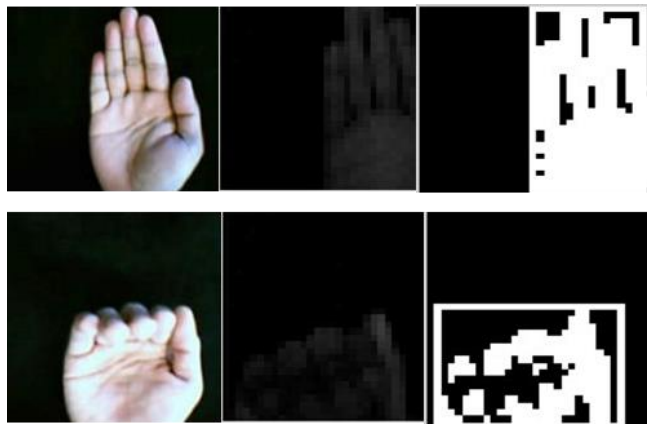

Fig. 3. Hand Image detection

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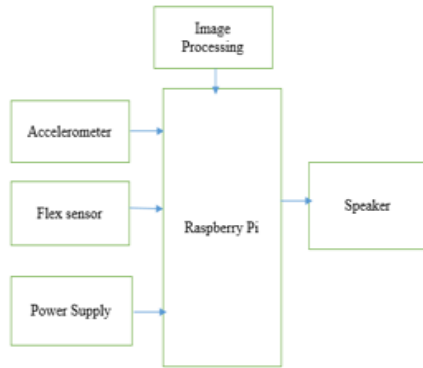
559

2. Block diagram

Fig. 4. Block diagram of hand sign interpreter

Raspberry Pi module is used to subsist this project work and this goes about as heart of this project work, which is utilized to deliver the output of the proposed work. Accelerometer sensors are the motion sensors Gesture based structure is a large scale microcontroller based structure being intended to streamline interaction among the dumb, deaf and blind peoples and their interaction with the normal persons. The proposed system can be impetuous reconfigured to work as a "smart device". The associate signals are passed to the Raspberry Pi board utilizing the image processing, here the image processing is interfaced with the Raspberry Pi to pass the motions.

A. Raspberry Pi

Features of Raspberry Pi

- *Operating Systems:* Raspbian, RaspBMC, Arch Linux, Rise OS, Open ELEC Pidora
- *Video Output:* HDMI Composite RCA

B. Flex sensor

If the fingers are bend the resistance of flex sensor will changes, there property.

Fig. 5. Flex sensor

3. Conclusion

Hand is the richest source for communication between the people. Speech impaired people uses sign languages to interact with people. To reduce the communication gap between speechless people and normal people. The above survey also shows some drawbacks such as in many systems image processing is used which is very tedious process. In some papers bulky and complicated hardware is used which is difficult to carry and also less portable. In some cases, optical fiber is used as a sensor but optical losses can be observed. To avoid all this, we are going to design a system using flex sensors& image processing technique. Also the system will become less complicated and user friendly.

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