

Implementation of Dumb Sign to Speech Using Mat Lab

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ABSTRACT

The aim of our project is to use computer technology to facilitate communication between two persons who cannot converse directly. A vocally disabled person using sign language will not be able to communicate effectively with other hearing members of the society. There is need of a system, which can perform translation between the two different modes of communication involved. Our project helps in bridging communication gaps between the dumb community and other people. The aim of our project is to use computer technology to facilitate communication between two persons who cannot converse directly. A vocally disabled person using sign language will not be able to communicate effectively with other hearing members of the society. There is need of a system, which can perform translation between the two different modes of communication involved. Our project helps in bridging communication gaps between the dumb community and other people.

I. INTRODUCTION

Persons who are born deaf or who lose their hearing at a very early age are unable to speak. They become dumb because, being deprived of hearing they are unable to imitate the sounds, which constitute speech. There are individuals who can hear but cannot speak. Our project is to bridge gap by introducing computer in the communication path. Therefore, for the benefit of blind people the sign language is automatically recognized and translated to speech. In the other direction, the recognized speech will be converted to text and displayed on the LCD for the benefit of the deaf.

II. LITERATURE REVIEW

In the paper [] recognition experiments on 16 types of gestures defined for remote work, the fine tuned composite HMM achieves the best performance of

96.88% recognition rate and also the highest reliability.

In gesture vocalize [] uses data glove, which can detect almost all the movements of a hand. This data glove is equipped with two types of sensors. The bend sensors and accelerometers as tilt sensors. It converts some specific gestures into human recognizable speech. This system is beneficial for dumb people and their hands will speak having worn the gesture vocalize data glove.

Flex sensors [] are sensors that change in resistance depending on the amount of bend on the sensor. They convert the change in bend to electrical resistance, the more the bend, and the more the resistance value. They are usually in the form of a thin strip from 1" to 5" long that vary in resistance from approximately 10 to 50 kilo ohms. They are often used in gloves to sense finger movement. Flex sensors are analog resistors.

The main objective of this paper [] is to develop a system that can convert sign language into speech so that deaf people are able to communicate efficiently with normal people.

III. METHODS AND MATERIAL

The main working principle of this project is conversion of the standard sign language of the dumb to a voice signal, which serves as a mouthpiece for dumb people. These gestures are the standard American gestures for the dumb and are accepted in the world today.

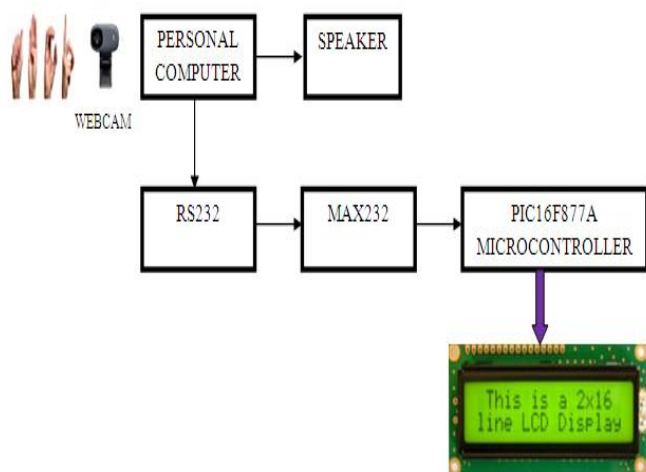


Figure 1. Block diagram of Dumb Sign System

The methodology of our project is carried out in three steps. First step is to input the real time hand gesture using web camera which captures the hand gesture made by the vocally disable person. Second step is to compare the real time hand gesture with the existing data base. The computer uses MATLAB version 7.5 for image processing. The last step is to display matched character on LCD and spell the character-using speaker.

The PIC16F877A microcontroller is connected to HD44780 LCD in 4-bit interface data, only four bus lines (DB4 to DB7) are used for data transfer. Bus lines DB0 to DB3 are having no connection with microcontroller. The data transfer between the HD44780U and the PIC16F877A is completed after the 4-bit data has been transferred twice. As for the

order of data transfer, the four high order bits (for 8-bit operation, DB4 to DB7) are transferred before the four low order bits (for 8-bit operation, DB0 to DB3). Any character on HD44780 LCD is displayed by sending its respective ASCII code. Hence to display 'A' on LCD microcontroller has to send 65h as data.

IV. RESULTS AND DISCUSSION

Dumb sign system has been shown in fig2 for American Signing Language (ASL) without invoking complex hand models. The results obtained indicate that the system is able to recognize signs efficiently with a good percentage of success.

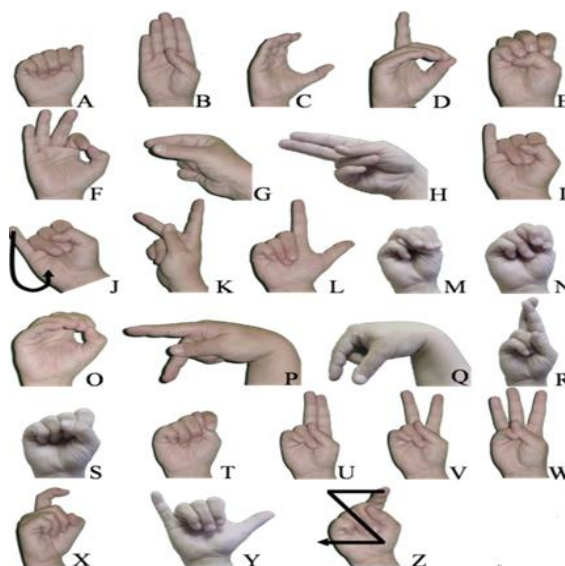


Figure 2. Hand Gestures of American Sign Language

Fig3 shows snapshot of the display unit, which displays the matched character. The experience gained from studying ASL will also contribute to the study of other sign languages and may be useful for the interpretation of a large set of virtual reality commands.

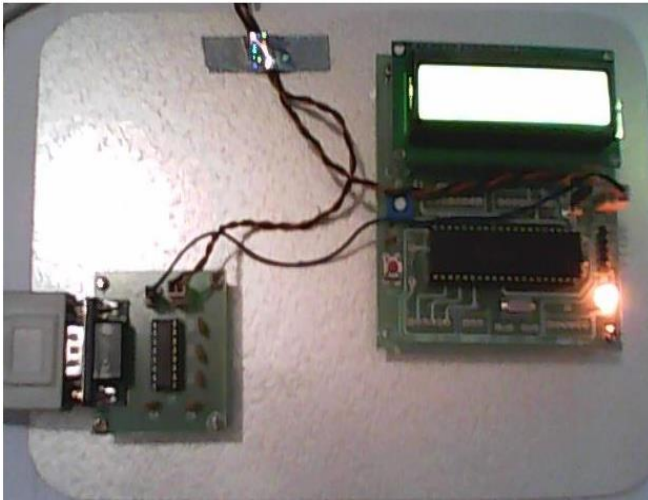


Figure 3. Snapshot of the Display Unit

The advantage of the system lies in the ease of its use. The original contributions of this work are system level techniques and optimizations for the achievement of real time gesture recognition.

Several new directions have been identified through which this work could be expanded in the near future. The techniques developed are not specific to ASL and so the system could easily be adapted to other sign languages or for other gesture recognition systems. A number of experiments will be used to evaluate and validate the proposed framework. One aspect of communication, which could not be handled in implementation of dumb sign to speech using MATLAB, is two-way communications.

V. CONCLUSION

Deaf and Dumb people rely on sign language interpreters for communication. However they cannot depend on interpreters in everyday life mainly due to the high costs and the difficulty in finding and scheduling qualified interpreters. This system has been shown for American Sign Language (ASL) without invoking complex hand models. The design and working of a system, which is useful for dumb, deaf and blind people to communicate with one another and with the normal people. The dumb people use their standard sign language, which is not easily understandable by common people, and blind

people cannot see their gestures. This system converts the sign language into voice, which is easily understandable by blind and normal people. The sign language is translated into some text form, to facilitate the deaf people as well. This text is displayed on LCD.

VI. REFERENCES

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