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Expressive and Deployable Hand Gesture Recognition for Sign Way of Communication for Visually Impaired People

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ABSTRACT

This work is mainly focuses the sign way of communication is one of the most effective communication tool for the people who are not able to speak or hear anything. It is also useful for the person who are able to speak but not able to hear or vice versa. Sign language is boon for the deaf and dumb people. Sign language is the combination of different gesture, shape and movement of hand, body and facial expression. With the help of sign language, these physical impaired people express their emotions and thoughts to other person. Hence sign language recognition has become empirical task. Since sign language consist of various movement and gesture of hand therefore the accuracy of sign language depends on the accurate recognition of hand gesture. This work present various method of hand gesture and sign language recognition proposed in the past by various researchers.

Keywords : Sign Language Recognition, Sign Language

I. INTRODUCTION

In this work, a special device is designed to make effective communication between the dumb and visually impaired person. In an emergency situation and in need of any usable things, the dumb person cannot communicate, for this purposes this system has been proposed. The visually impaired person cannot visualize things but they can communicate with the voice whereas for the dumb person, they can visualize but they can't speak. When these two persons are living in a same room, there won't be any interaction between them and communication lags. According to dumb people for each gesture there will be a separate meaning whose message templates will be taken and kept in a database. The gestures are taken as a snap and that were compared to gestures which are stored in a database. First the images are taken as a snap and compare with gestures stored in the database and finally for the matched gestures, the

II. EXISTING SYSTEM

In the current system, a glove with attached flex sensor are worn on the hand. The sensor attached with glove capture the hand movement and position. In this method hand detection is not required. One of the advantage of this method that it provides accurate position, orientation of the hand, fingers of the palm. The demerits of this

method that it requires the user to connected with the computer physically which make it very uncomfortable technique. This method is also expensive due to the use of sensory gloves.

Disadvantages

- It is difficult to understand these language therefore often these physically challenged has to keep the translator along with them to communicate with the world.
- It is too expensive due to the use of flex sensor.

III. PROPOSED SYSTEM

In the proposed system, We recommend that the Gesture of human body part is one of the important tool for representing the expression and it is the way to establish a communication between human and computer in virtual environment. This sign way of communication is used to capture the gesture and posture of the hand. In this work we establishing an approach ie., Vision based approach. This approach requires camera for capturing the hand gesture or body part gesture this gesture in the form of video or images is then given to the computer for recognition purpose. This approach is most suitable for real time application has many challenges like background problems, variation in lighting condition, color of skin etc. Recognition Time, Computational complexity, robustness are some of the constraint poses by the system.

Advantages

- It is simple, natural and it directly interact the user with the computer. This technique uses some of the characteristics of images like color, texture for analyzing the gesture of hand or other body parts.
- It is used for extracting, segmenting or detecting the hand object from the image

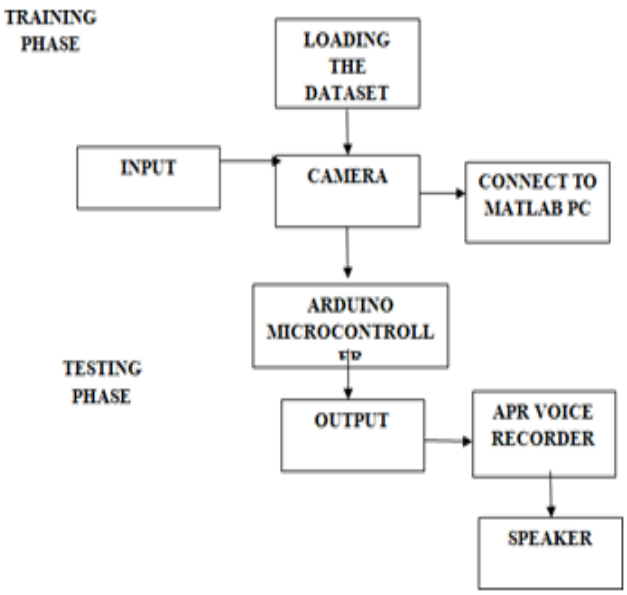

Fig.3.1. System Architecture

IV. MODULES

A. Feature Extraction

From the training and test images first the face region is detected and cropped . Then Gabor filter is applied tom extract features from hand region. The extracted features are concatenated to form vectors.

In machine learning, pattern recognition and in image processing, **feature extraction** starts from an initial set of measured data and builds derived values.

B. Distribution-To-Classifier Mapping

In the training images first SVM classifier is applied to obtain individual classifier parameter then using regression mapping function is learned.

C. Algorithm

Input:Ds, … . . Ds ,Xt and appropriate parameters .1..N

Phase 1.Learning User-specific Source Classifiers Compute θi ,$\forall i = 1$ … … N using (2)

Phase 2.Learning a Distribution-to-classifier Mapping Create training set $T = \{(Zi, \theta i)\}N$ where $Zi = Xs$ *or* $Zi = Xi.i=1 \quad i \quad s$

Compute the source kernel matrix K, $Kil = k(Zi, Zl)$ using 19 . Given K, T compute $f(.)$ solving 3 $\forall k = 1 \dots \dots K + 1$

Phase 3.Computing target classifier

Compute target kernel vector Kt, $Kt = k(Zi, Xt)$

Using Kt compute $\theta t = f(Xt)$

D. Target Classifier

From the training images kernel function is extracted and then applied to mapping function to get classified output. Targets recognition in radar images presents an essential task for monitoring and surveillance of sensitive areas such as military zones. The fundamental problem in radar imaging is related to the recognition of objects in radar images.

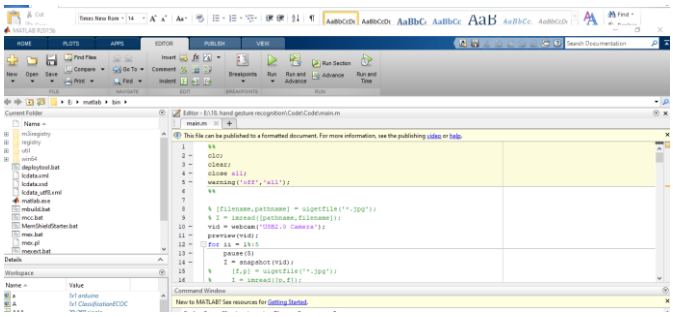

Fig.4.1. a Saving the code

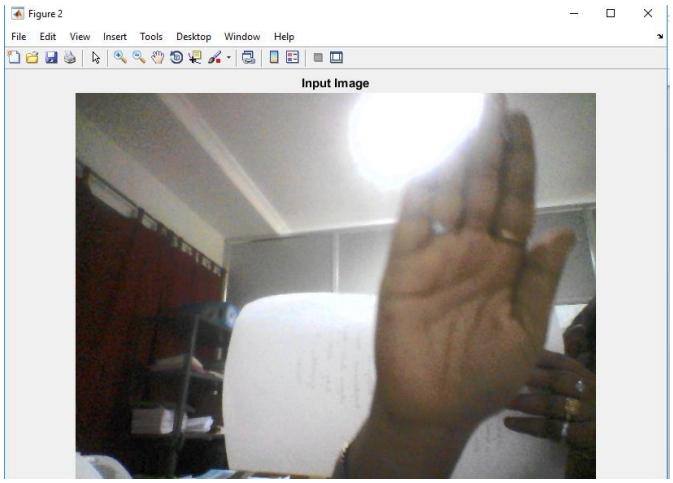

Fig:4.1. b Input Recognition

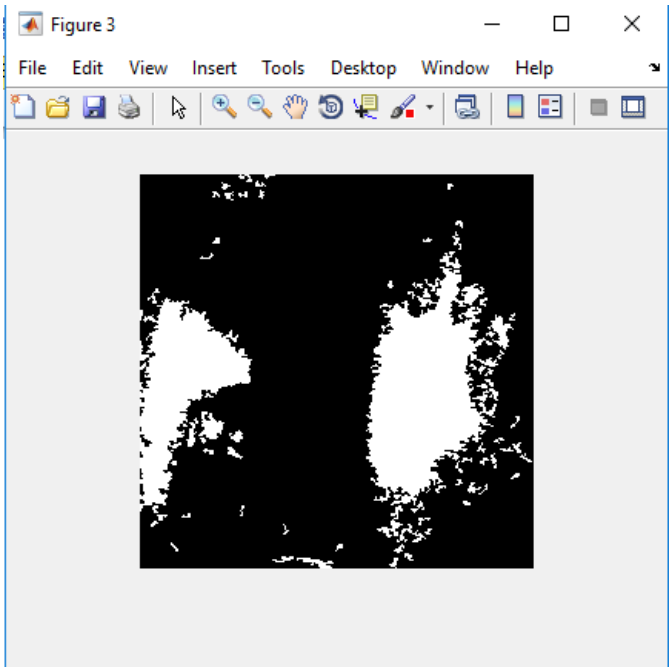

Fig:4.1. c Feature Extraction

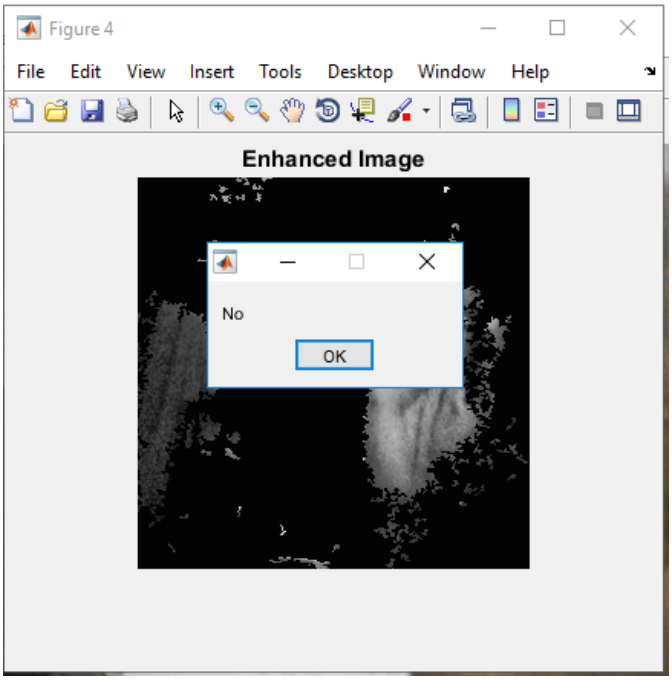

Fig: 4.2 Converting images to messages

V. CONCLUSION

This work is started with the combination of Neural Networks. As we defined the working of orientation histograms, which is essential for classification that's why we will used it. In additional approaches of pattern recognition that orientation histograms have been used special

conduct of comparing and classifying were utilized. It is an efficient algorithm. Another advantage of using neural networks is that we can illustrate conclusions from the network output. It is finally declaring that there is a robust conclusion at the end of the work. This is possible only for the first part of the work. Regardless of how many times you run the program the output vector will always be the same. This is not the case with the perceptron. Apart from not being 100% stable there are so many parameters (e.g. number of layers, number of nodes) that one can participate with that finding the optimal settings is not that straight forward. As mentioned earlier it all comes down to the application.

VI. FUTURE ENHANCEMENTS

The future scope of the work is to enhance the recognition capability for various lightning conditions and achieving more accuracy. Implementing and identifying the more number of gestures. The miniature of the system should be done.

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