Hand Gesture Recognition for Devnagari Sign Language
Gaurav Pandit¹, Nitin Parandwal², Sandip More³, Rupali Deshmukh⁴
Professor⁴
Department of ENTC Engineering
DIT College, Maharashtra, India

Abstract:
Sign language is widely used in hearing impaired people as communication media. Devnagri Sign Language Translation System using histogram matching algorithm is proposed in this paper; for recognizing Devnagri Sign Language alphabets, the steps of algorithm are Image capturing, Image Pre-processing, Hand region extraction, Feature extraction and histogram matching. Image is captured in RGB color space using general Laptop camera mounted on top of the laptop. In image pre-processing morphological operation like blurring, noise removing is done. In region extraction stage, hand region is extracted and then edge detection is done. The third stage is feature extraction; in this the histogram of cropped image is taken. The histogram obtained in this stage is compared with the histogram of image in the training dataset and similarity factor is calculated. Perfect match is obtained for highest similarity factor. In this paper hand gestures for Devnagri Sign Language (DSL) which includes 13 vowels (“swars”) and 33 consonants (“Vyanjan”) are taken.

Key Words: Devnagri, Sign language, hand gesture, Histogram.

1. INTRODUCTION
Sign language is a type of language that uses hand movements, facial expressions and body language to communicate. It is used by the deaf and people who can hear but cannot speak. Sign Language is a structured language where each gesture has some meaning assigned to it used by Cloth-eared sign user. Sign language is only the way of communication for Cloth-eared sign user. Sign Languages are the basic means of communication between Cloth-eared sign user. Static morphs of the hands, called postures, together with hand movements, called gestures, and facial expressions form words and sentences in sign Languages, corresponding to words and sentences in spoken languages.

2. FLOW OF HAND GESTURE RECOGNITION
Flow contains different stages like capture image, process image, extract image, generate feature vector and histogram matching. After the image is captured then the further processing includes filtering of binary image. The extracted features obtained after binary filtration and feature matching are compared for both the input and training set images. An image is captured in RGB color space with resolution of 160 × 120 using Laptop camera. The flow of hand gesture recognition system algorithm is presented as shown in Fig 1.

2.1. Input:
Initially input is taken from user it is gesture image. The input image capture using laptop camera.

2.2. Pre-processing:
Pre-processing is done at the time of the inputting the image. It includes the loading the input to the system. The system takes this input and made it for the feature extraction.

2.3. Skin Detection:
To identify and isolate the user's hand from a picture containing only his/her hand. We used a color characterization method which is based on RGB as well as on the HSV color models.

2.4. Feature Extraction
During the feature extraction phase the parameters of input image are extracted for the recognition. This parameter includes the values stored for the corresponding image.

2.5. Pattern Matching/Recognition:
The parameters obtained in the feature extraction phase are compared with our database. The database already contains the parameter set for corresponding image. So the input parameters are matched with predefines parameters and correct output is recognized.

3. SYSTEM IMPLEMENTATION
The flow of hand gesture recognition system implementation is presented as shown in Fig 2.
4. BLOCK DIAGRAM OF SIGN LANGUAGE RECOGNITION

The flow of sign language recognition is presented as shown in Fig 3.

![Block diagram of Sign language recognition using skin filtering](image)

Figure 3. Block diagram of Sign language recognition using skin filtering

5. CONCLUSIONS

Deaf sign users are totally depends on the sign language translator for communication. So they cannot be relying on the translator in each and every day. Also the cost of the translator is very high which difficult for each deaf sign user for every day. This system will help deaf sign user in improving their quality of life significantly. With the help of this system deaf person’s life is become easy and signer independent. The vocal people from society can also learn the sign language and contribute to communicate with the deaf people. The offline detection of sign language will work based on the database which is already made by us. The system was designed for recognition of Marathi sign language. And system was capable of handling static alphabets. We have tried to increase the recognition rate of the previous work. We have performed experiments only with the static hand gesture recognition.

6. REFERENCES


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7. BIOGRAPHIES

Nitin Parandwal, DIT, PIMPRI, PUNE

Sandip More, DIT, PIMPRI, PUNE

Rupali Deshmukh Professor, Dept. of ENTC Engineering, DIT

Gaurav pandit, DIT, PIMPRI, PUNE