Marathi Sign Language Recognition using Dynamic Approach

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Abstract- *Communication between deaf-dump and a normal person have always been a challenging task. About 9 billion people in the world come into this category from which India constitutes 2.4 million of deaf-dump population which is quite large number to be ignored. These people lack the amenities which a normal person should own. This decreasing a ratio of literate and employed deaf. As deaf-dump people use sign language for their communication which is difficult to understand by the normal people. There-fore we propose the Marathi sign language recognition system which aims at eradicating the communication barrier between them by developing system which will translate hand gesture into textual and vocal format without any requirement of special sign language interpreter. The cost of interpreter is very high which cannot be possible for each deaf. This system can also be proved useful for solving same problem of two Persons which knows two different languages. The first step of system to Create the database of Marathi sign language. We compile the sensor based dataset. In dataset hand movements are captured using two DG5-V hand gloves. Data labelling is performed using a camera to synchronize hand movement with words. The output of system is displayed using speaker and LCD. In this way we are trying to help to improve quality of life of the deaf community.*

Keywords- DG-Data Gloves, RGB-Red Green Blue, LCD-Liquid Crystal Display

I. INTRODUCTION

Each country has its own defined sign language and used for communication with their community. Similarly Indian people uses Different sign language for communication one of this is Marathi Sign language. Marathi sign language alphabets contain the vowels and consonants. When two person are communicating their body language plays an important role to understand their thoughts. In our proposed system we are implementing the Marathi sign language reorganization. This system is designed to recognize the 43 Marathi sign which consist of vowels and consonants. When the Particular sign is recognized then system will generate text and voice of recognized sign.

II. THE EXISTING MODEL

Priyanka lokhande [1] proposed in this recognition of sign language through the embedded system in this embedded system translating the hand gesture into a proper word and voice which is define at the time of registration is used they are uses static approach for this.

Rini Akmeliawati and Yang quan[2][3] Proposed that the sign language video are captured through the video camera and stored in system and then this video images are converted into bitmap image and using the image processing technique particular sign are recognize and produce sentences for this video.

In[4] describes segmentation and detection of hand from video frame using skin color model followed by hand feature extraction. in this they are tracking the hand movement and hand gesture features for any Indian sign language .

S.R.Waghmare, P.K.Patil[5] describe that the four approaches for sign recognition which is Skin filtering, hand cropping, feature extraction and classification.

III. PROPOSED SYSTEM

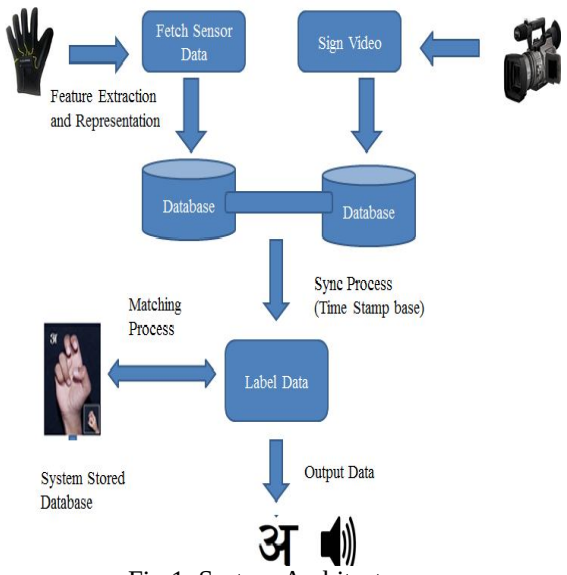

Fig 1: System Architecture

A. Sign Video

Input image is captured from web camera. When user gives the input sign he must give in proper form so the detection and processing of image will be easy.

B. Feature Extraction

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

C. Pre-processing

Pre-processing is done during the inputting the text or image. It includes the loading the input to the system. The system takes this input and made it ready for the feature extraction.

D. Fetch Sensor Data

Input is fetched from the hand gloves input are in the form of bending movement of data which is used to store prepare the database and recognition process.

E. Database of Image and Hand Gloves

Database of image and hand gloves are stored separately at the time of registration process. Database of video camera are store in the form of images and database of hand gloves are stored in the form of hand movement.

F. Labeled Data

After the comparison process whatever result is produced that is in the form of labeled data which is used for displaying the final output are in the form of text and voice

G. Image Processing

The sign language recognition done using cameras may be regarded as vision based analysis system. The idea may be implemented using a simple web camera and a computer system. The web camera captures the gesture image with a resolution of 320x240 pixels. The captured image is then processed for recognition purpose.

H. Gesture Capture Using Web Camera

The first step towards image processing is to acquire the image. The acquired image that is stored in the system windows needs to be connected to the software automatically. This is done by creating an object. With the help of high speed processors available in computers today, it is possible to trigger the camera and capture the images in real time. The image is stored in the buffer of the object. Image acquisition devices typically support multiple video formats. When we create a video input object, we can specify the video format that you want the device to use. Some image acquisition devices use these files to store device configuration information. The video input function can use this file to determine the video format and other configuration information. The imaqhwinfo function is used to determine if our device supports device configuration files. If the input is an RGB image, it can be of class uint8, uint16, single, or double. The output image, I, is of the same class as the input image. If the input is a color map, the input and output color maps are both of class double. The acquired image is RGB image and needs to be processed before its features are extracted and recognition is made.

I. Processing

The captured image is a RGB image. This image is first converted into gray scale as some of the preprocessing operations can be applied on gray scale image only.

Figure 2: Input Image in the Form of Gray-Scale the Form of Gray-Scale

IV. EDGES & PEAKS DETECTION

Edge detection is an image processing technique for finding the boundaries of objects within images. It works by detecting discontinuities in brightness. Edge detection is used for image segmentation and data extraction in areas such as image processing, computer vision, and machine vision.

Figure 3: Detected Finger Peaks

V. SYSTEM MODULES

Two modules will be incorporated.

- Registration
- Recognition.

Registration Module

In registration module we are storing the information related to the particular images which is use by mute people.

Firstly system tacks the input from the webcam or video camera and then processes this image.

After getting the result of image processing whatever result is produced this is stored into the system database.

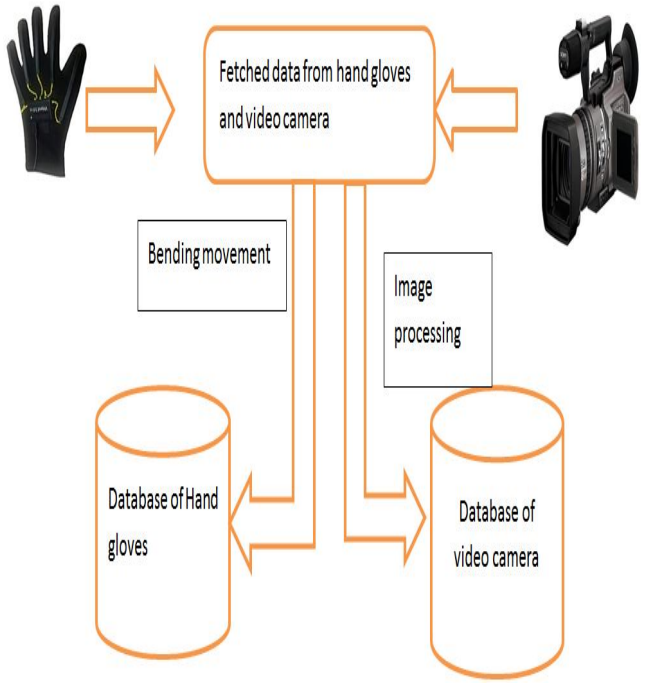

Figure 4: Marathi Sign Language Registration Process

B. Recognition Module

In recognition process camera capture the image and then complete image processing process is done.

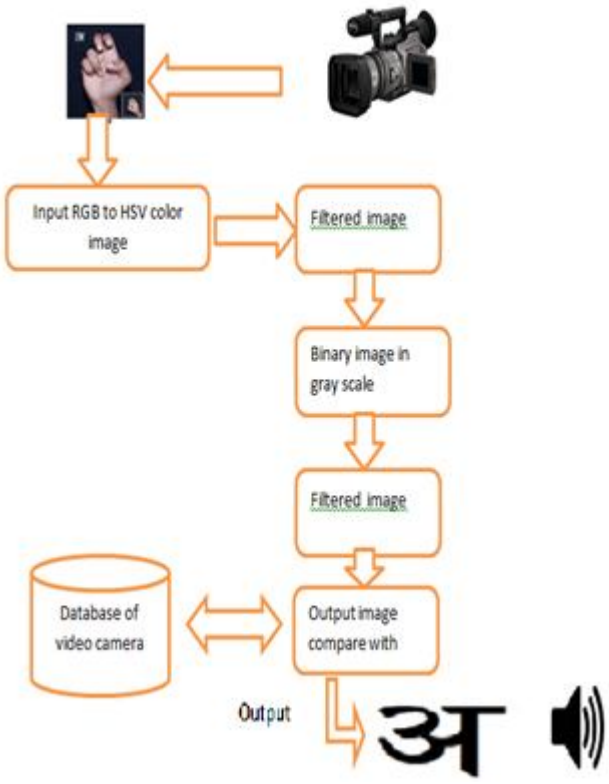

Figure 5: Marathi Sign Language Recognition Process

VI. CONCLUSION

This project is useful for deaf and dumb people those cannot communicate with normal person. It is also useful for speech impaired and paralyses patient means those do not speak properly Sign language recognition and translation is an active area of research. People with limited fluency in sign language can easily communicate with hearing impaired people with the converter that has been proposed in this paper. As this converter recognizes the signed images made by the signer and converts them into text as well as speech without any use of data gloves or other equipment. Thus, interaction gets simplified between people with or without hearing or speech impairments. For further work, videos of hand gesture could be captured and recognized through the implementation of the same algorithm.

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