Learning Techniques for Deaf and Dumb People using Hand Recognition and Text to Voice Conversion

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Abstract- As we are able to communicate with one another .It's not the same with Deaf and Dumb People. They do communicate within their people. But won't be able to communicate with normal person. For that if so we come in a situation where we need to communicate .it would take long time to learn their language .For convenience we have design a software where a Deaf and Dumb People will be able to communicate with us .by just performing hand gestures in front of camera in turn it will capture image and get you audio. Else you can type a text and in turn you get audio, else u can type a text and it will display you they image. In this manner you can convey your message to DADP and visaversa.Here we also provide learn by detection. This software may also teach you some basic notations so that there will be no confusion with images. Images are standardized.

Index Terms- Localization; Segmentation; Blob analysis, DADP, Pixel, and CBIR

1. INTRODUCTION

This project emphasis on communication between a DEAF and DUMB People and normal people. It's very difficult to learn their language. People who are unable to speak can get ,what we are able to convey. But when it come to us it's not possible to get them. For this purpose we have develop this software so that we could get what they are upto, what they want to convey. Our basic idea was to communicate with them. For that purpose we have develop three modules.

1. Text to Voice
2. Text to image
3. Learn By Detection

These three modules will surely help us to communicate with (DADP).in this system we will store images. Images will be standardized. Whatever we will type text we will either generate voice or image depending on the module selected. The system has also added videos, pictures for better understanding. For this software you just need to install on your computer. There is no login procedure, login is only for admin.This system can be used for teachers, news reporters etc.people those using should at least have basic knowledge of computer. Various algorithms are used. In this we gona perform

localization, segmentation pixel analysis. In hand gesture your movements need not be static it may be dynamic in such case detecting image and getting correct output is little trouble some. But in case of Static image it's not hard and fast rule. There are basic problems faced is

1. Camera
2. Distance
3. Intensity
4. Static and dynamic movement

These are not problems but we need to take a great concern for correct output.

2. RELATED WORK

Various computer vision based man-machine interface researches were developed by using cameras of single lens[1], multi-lens [2], depth perception lens [3], or infra-red lens[4]. Different lens give different information. The more information utilized, the higher recognition accuracy would be. However, these cameras may require special installations and cost much for the information extraction. According to The survey given in [5], there are other different methodologies used for human gesture recognition ranging from principle component analysis [6], hidden Markov model [7], particular filtering [8], and finite state machine [9] to neural networks [10]. In the following, we will brief some researches in hand gesture recognition for device control and discuss the feasibilities of proposed hand gestures for operation.Wu [11] developed a hand gesture

recognition system for Media player control. The system firstly separated the left arm by background subtraction and detected the straight line by both Hough transform and Radon transform. The disadvantage of this method was the non-instinct of defined hand gestures. Lai [12] designed and implemented an interactive biped robot which could be controlled by hand gestures. The number of fingers and angles between fingers were used to classify nine types of static hand gestures. To Overcome the effect of lighting, they utilized scroll bars to manually set the scope of skin color in *YCbCr* space. Tu [13] presented a face based hand gesture recognition system for human-computer interaction by a single camera. Hand region was assumed to appear by the side of face. Eleven static hands gestures were defined to control the computer. Back Propagation neural network was utilized for hand gesture recognition. However, users need to remember the meaning of each hand gesture which may be confused due to similar shape. Some systems have limitations that user sat in front of Camera within a specified distance. Here, we try to relax these limitations. Firstly, we propose a face based adaptive Skin color model for hand region segmentation. Secondly, the adopted dynamic and static hand gestures are simple and intuitive.

3. WORKING MODULES

We have Text to voice conversion, Text to image, image capturing and comparing.

3.1. *Text to voice Conversion*

In this module we are going to type text and in return we are going to get voice .This will be helpful for Conveying message In this images are given letters these are stored in are database. When a text is typed the voice command gets generated. There is amplitude it will give speed of the voice. In this you can type a sentence also.
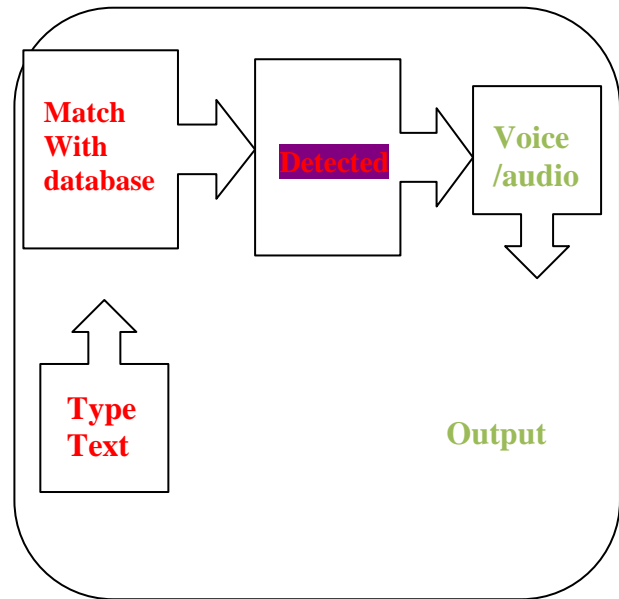
Text Inserted = Gives you voice/audio.

Fig. 1: Block Diagram for Text to voice

3.2 .Text to image

In this module we are going to type a text and for that text we are going to get image. The image will be stored in our database. Each letter will be given specified image .so that there is no confusion. User need to study these images so as to convey message.

Text inserted = Image Related to That Text is Displayed.

3.3. *Learn by Detection*

In this module images are stored in database. The user perform hand gesture in front of camera .Image is captured and it matches with the image stored in database and give us output in audio as well as provide us with an image.

Gestures perform = Matches with Database and gives The correct answer.

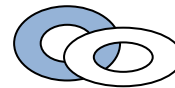## 4. ALGORITHMS USED

Following are the basic algorithm used.

4.1. Localization.

Images are either static or dynamic .for static image we do not have problem .while dynamic image to localize is problematic. Thus to locate an image the gesture should be proper it should be within camera distance .illumination should be proper.

4.2. Pixel matching.

In   this input that is hand gesture are divided into pixel alike pixel form an image.

Fig. 2: Pixel analysis

4.3. Color Analysis

Skin color detection plays an important role in image processing application ranging from face detection, face tracking, gesture analysis, content –based image retrieval (CBIR) system and to various   human computer interaction domain.
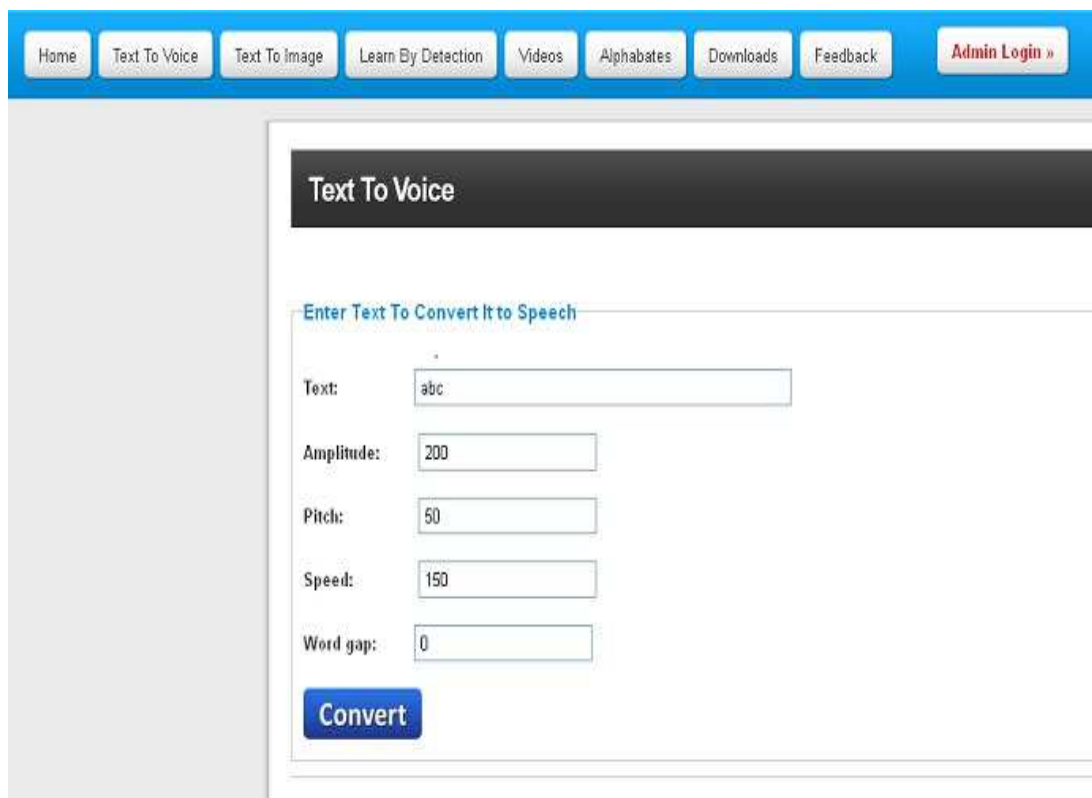
5. RESULTS / OUTPUTS

Fig.3: Home page/Module 1

This *is our home page .where you can login for any of three modules. Here it represents Text to voice module.* When a Text is typed you get audio. Example…..”HELLO” is typed it get prounced as “HELLO”.

Fig.4: Home page/Module 2

This is our second module. When Text is inserted we get image. This image convey you the message.
In this module for "H" a particular image stored in Database .similar for other alphabets.
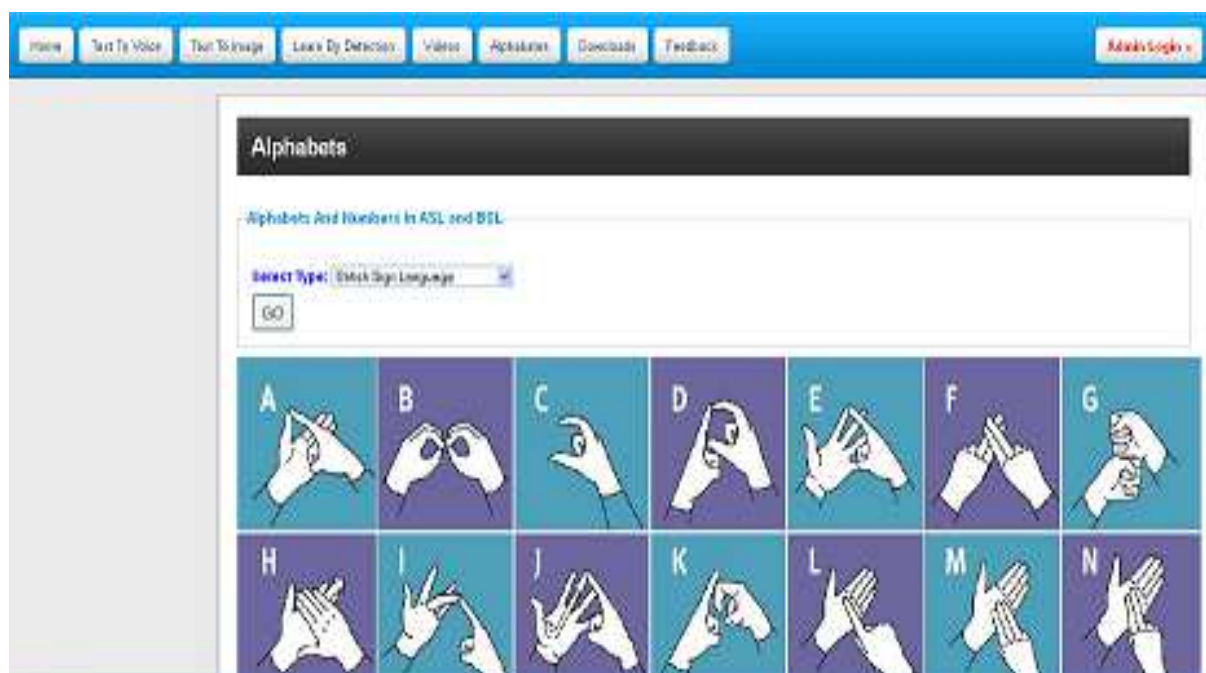

Fig 5. This represents stored database for learning and image matching process
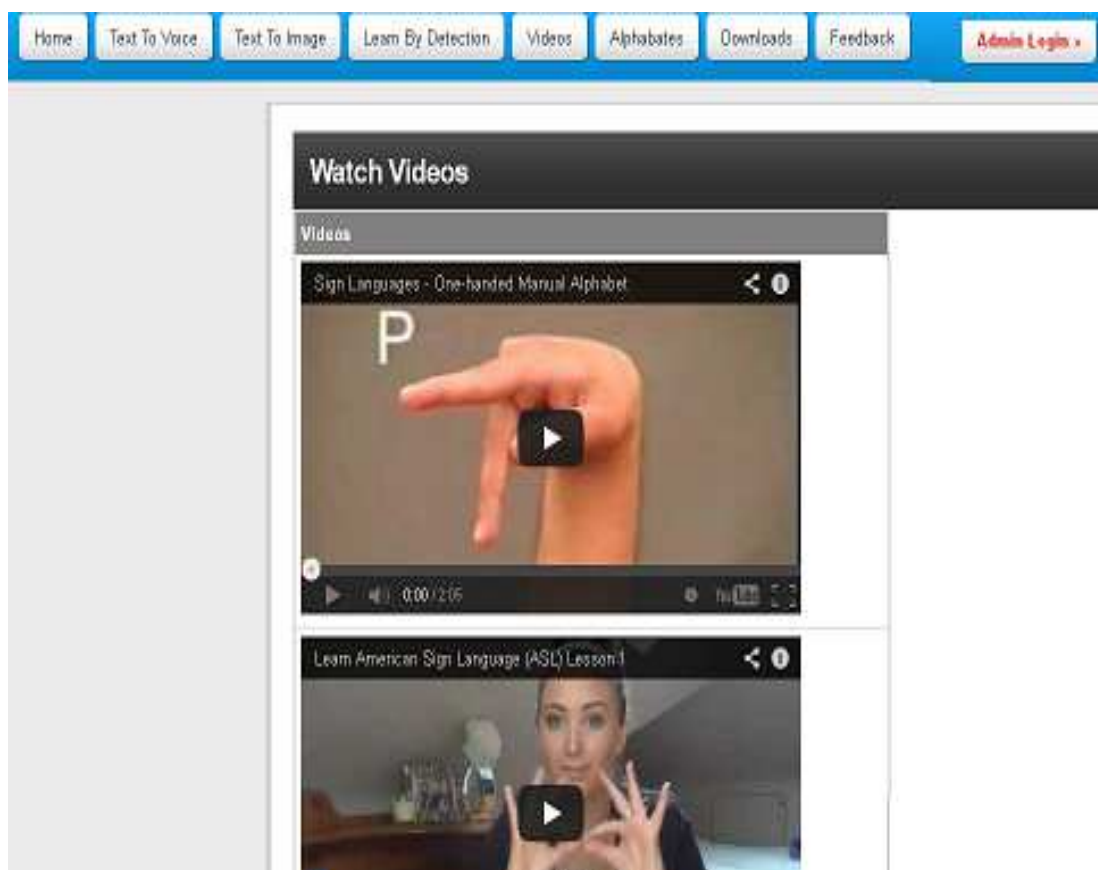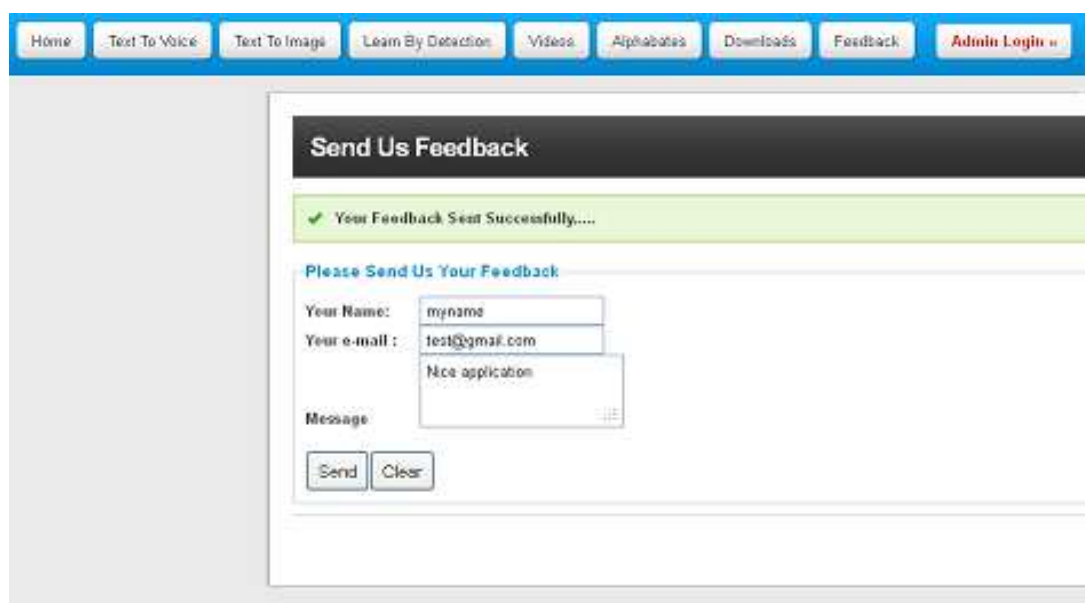
Fig.6 .For learning purpose videos uploaded

Fig. 7: Feedback module

In this module a user can tell what problem faced, what changes need to be done, what new can be added. This module will be examined by the admin only.
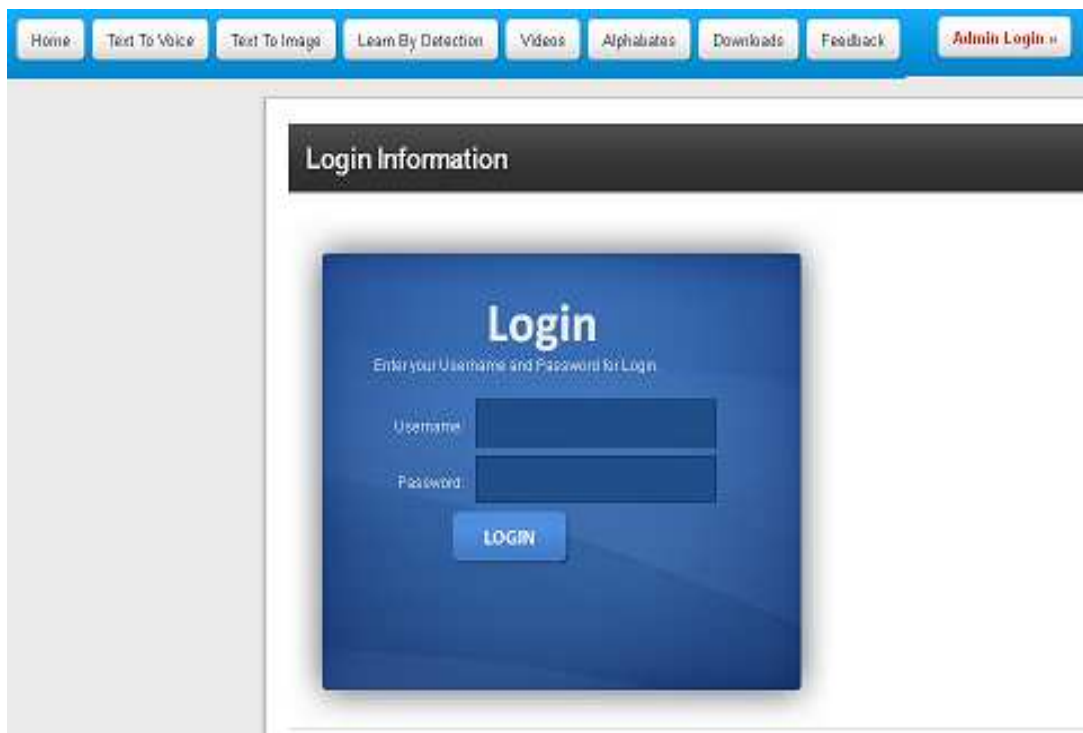
Fig.8: login page

Both the pages are handled by the Admin. System has login page for the Admin only not the user. For this page admin can add image, video. The images and videos will be standardized by Admin only.
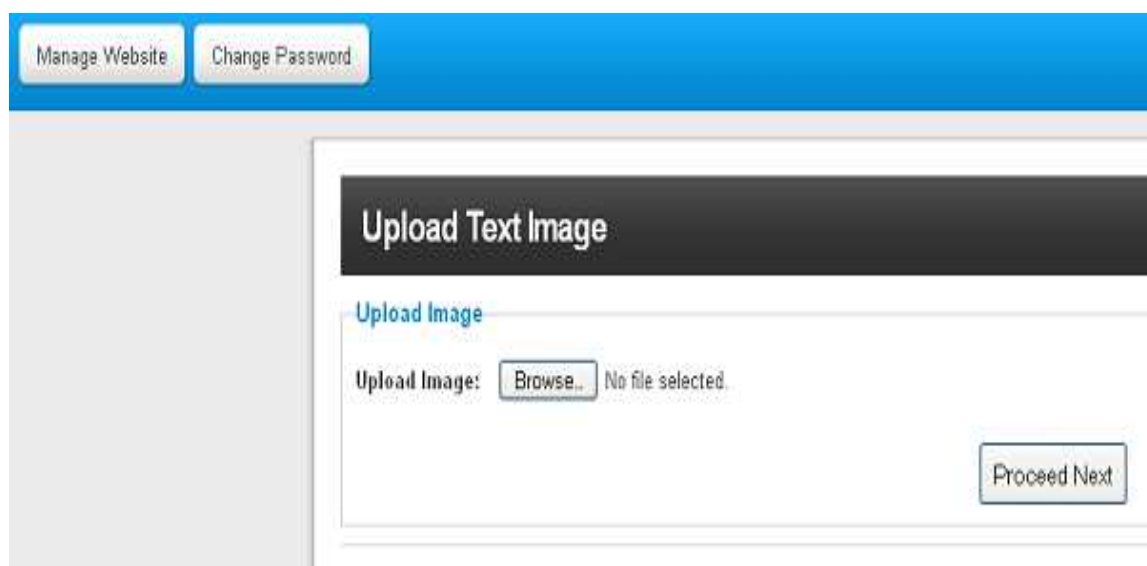

Fig.8

5. CONCLUSION

This is a Real-Time application. This will be prominently used by the Reporters, Docters, and Teachers etc .So as to communicate with (DADP) and convey their message to the world or can be used to help them. As we are able to convey are emotion by are words it is not the same with DADP .for this purpose we have develop this system. This will be useful for both people normal as well as DADP.There are images, videos, hand gestures. Which are useful for learning purpose.

6. FUTURE WORK

As this application is not yet been implemented in INDIA. Further more research are going on. Likewise we can also use this system in a mobile phone where DADP can learn gestures as well as use it for communication. The other way it can be through hand gloves, where you can use sensors and voice also. So that the gestures can be understood. We can also implement this using robot Where the robot will convey or communicate with DADP thus we can come to know what they want to convey message. This system can also be implemented through a wheel chair with a computer mounted on it. It can also be implemented through Head cap sensors. Work is in still progress .as the devices are costly it is not affordable.

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