



# Hand Gestures Recognition and Voice Conversion for Deaf and Dumb

D.Phani Kumar | G.Siva Naga Mallika | Nandani Kumari | T.Polaiah

Department of Computer Ccience and Engineering, Godavari Institute of Engineering and Technology(A), JNTUK, Kakinada.

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## ABSTRACT

*Sign language performs a main function for dumb humans to talk with everyday people. It is very challenging for those human beings to deliver their message to ordinary people. As regular humans are now not skilled on sign language, it is very difficult for dumbin emergency time to convey message. So the solution for the trouble is converting their sign language into voice such that normal people can understand and will help them. There exists couple of essential strategies handy to notice hand movement or gesture such as imaginative and prescient and non-vision approach will convert the detected gesture into voice. In vision-based method digital camera is used for gesture recognition. In this assignment non-vision based method will be implemented.The majority People who are dumb are deaf also. So, the regular people's voice can be transformed into their signal language.*

**KEYWORDS:**Deaf and dumb,Sign language, Hand gesture, SVM Algorithm,Convolution Neural Network, Gesture recognition.

## 1.INTRODUCTION

Nowadays all of us usually apprehend about new science that enhances our style of livingthat makes our subsistence easier. Evolution of new machinery has revolutionized the life of human beings. Human race has put a lot of tools in science and they are no longer in a temper to pass the pedals away from this gear. There is big lookup on quite a number technological know-how area namely Machine Learning, Artificial Intelligence, Smart devices and many more. These new technologies helped to come up with new innovations and that made one's life easier. There has been a very much less lookup for dumb and deaf people. This theme has got lesser interest as in contrast to different sectors. The major difficulty that is faced by these distintive people is the verbal exchange space between special category of people and normal people. Dumb and Deaf humans

continually encounters a lot of difficulties to talk with ordinary person. This massive mission makes them uncomfortable and they experience discriminated in society. Because of omit conversation dumb and deaf humans sense no longer to talk and subsequently those people are in no way capable to express their feelings.

Hand Gesture Recognition [7] and Voice Conversion (HGRVC) machine localizes the hand movements of the deaf and dumb people in order to hold good communication channel with the different people. The identification of hand gestures can be accomplished the usage of camera. [8] The photos are transformed into widespread computation with the help of pre-processing. The aim of the task is to enhance a device that converts the hand gestures into text and voice. The focal point of this mission is to region the images in the database and with database matching the photo is transfigured into

text. The detection entails commentary of hand movement. The approach offers result in textual content structure as well as voice also that helps us to minimize the conversation space between dumb and deaf people. Totally the paper is segregated into 5 sections. The first area contains all the researches associated to topic. Second area is about the technique that focuses on hand gestures. Third part is the working part of the device. Fourth area is the result/output part of the device and the final part narrates about the conclusion and precision of the system.

## 2. EXISTING SYSTEM

In existing system we use a machine learning model which will predict hand gesture and the detected hand gesture will be converted into voice so we can understand what deaf and dumb people are saying. We use SVM algorithm in this project but SVM is not accurate in identifying hand gesture in python.

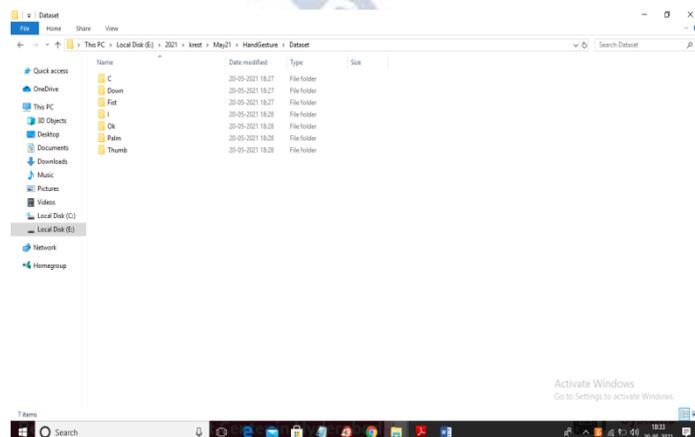
## 3. PROPOSED SYSTEM

In this proposed system the hand motion or gesture of dumb people will be detected and it will be converted into audible voice and text will also be displayed on the screen. We are using deep learning Convolution Neural Network to train hand gesture images and then this trained model can be used to predict those trained hand gesture from webcam.

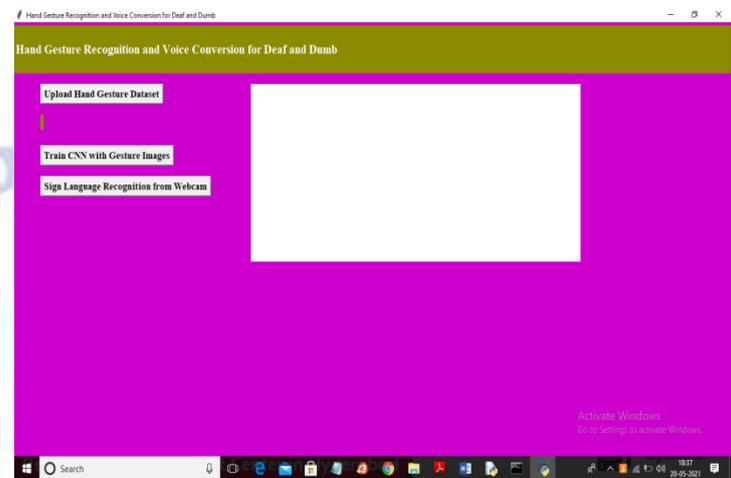
When we run project for each prediction following modules get executed

- 1) Extract image from webcam
- 2) Convert the input recognized image to binary/ grey format and remove the background objects.
- 3) Extract features from image
- 4) Recognition and play audio

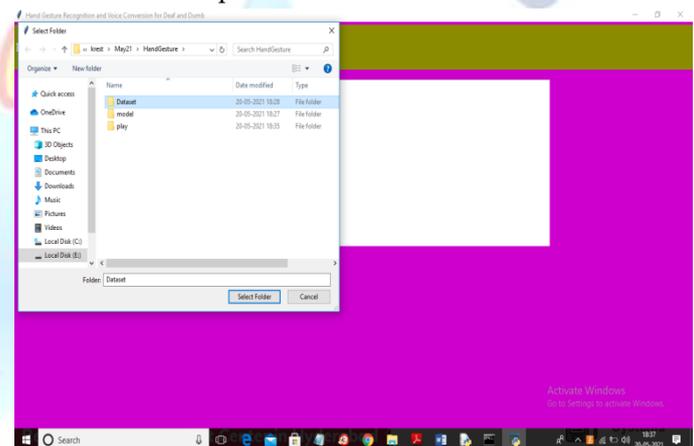
## 4. RESULTS AND DISCUSSION



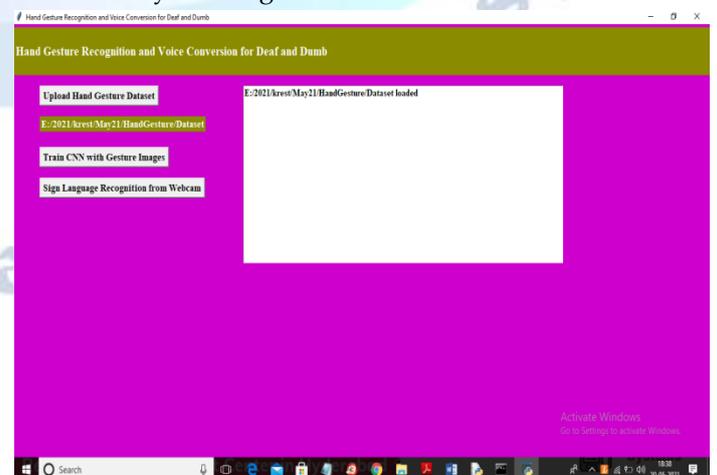
**Fig 1:**In the above dataset we have seven different types of images such as thumbs up, down, C, I, OK etc. This is computer program so it can predict 8 times correctly out of 10. Just we need to show gesture in webcam properly.



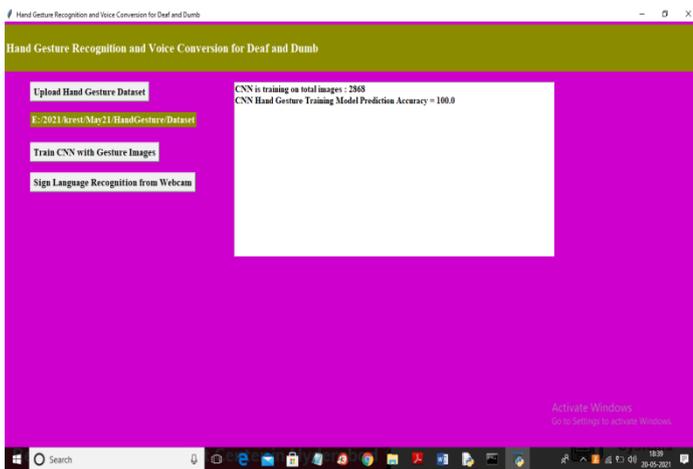
**Fig 2:**In the above screen click on 'Upload Hand Gesture Dataset' button to upload dataset



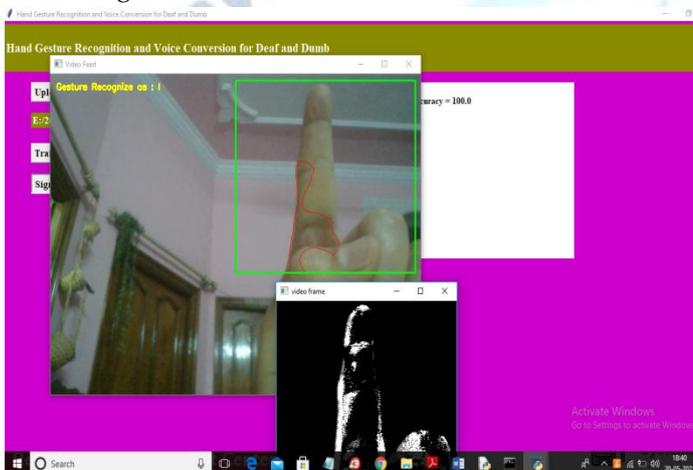
**Fig 3:**In the above screen select and upload Dataset folder and click on **Select Folder** button to load the dataset and you will get the below screen.



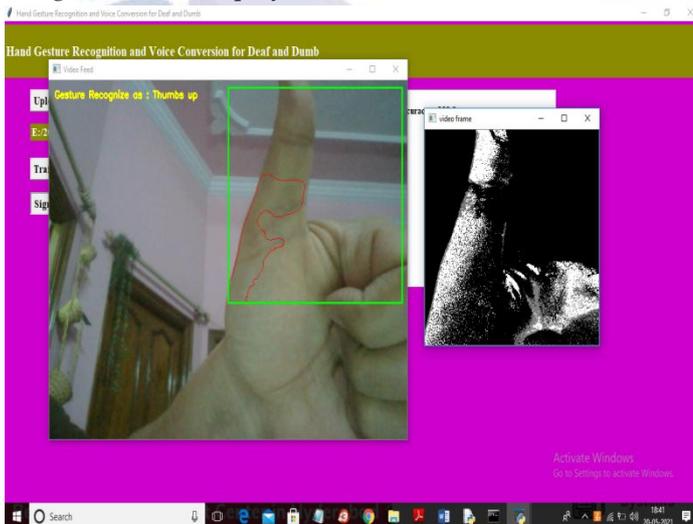
**Fig 4:**As shown in the above screen dataset is successfully loaded. Now click on 'Train CNN Gesture Images' button to train Model.



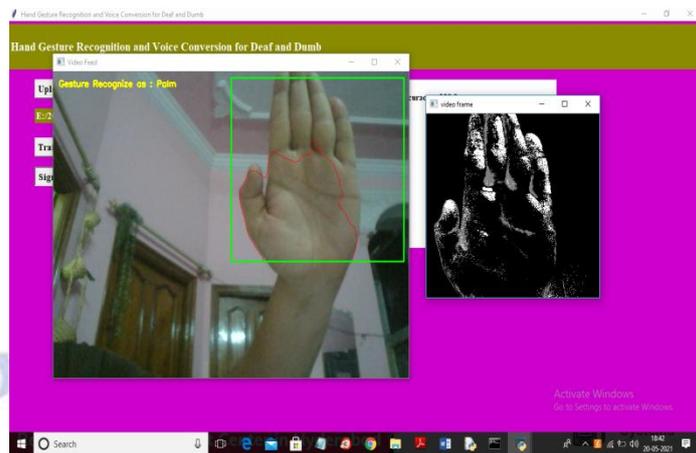
**Fig 5:** In the above screen CNN model generated and now click on 'Sign Language Recognition from Webcam' button to get below screen.



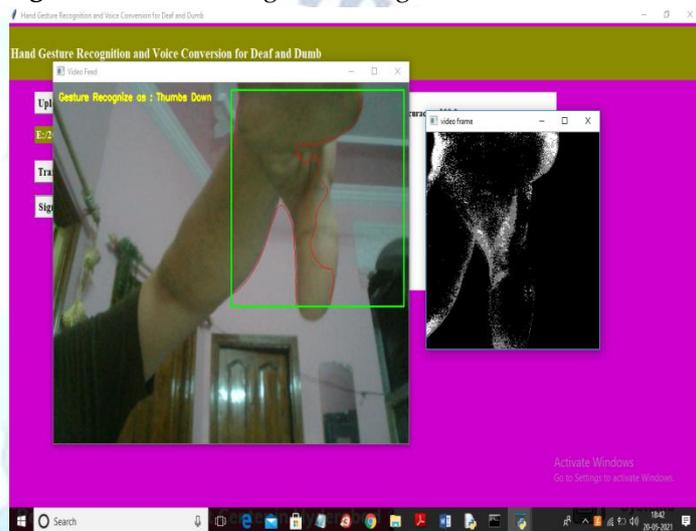
**Fig 6:** In the above screen just show ur hand gesture in green colour rectangle box then application will recognize and then play it as voice



**Fig 7:** The above recognized image is Thumbs Up



**Fig 8:** The above recognized image is Palm



**Fig 9:** The above recognized image is Thumbs Down Here just you need to show gesture properly as shown in above screen and while adjusting your hands u may get wrong prediction but when u correct u correct ur gesture then prediction will go accurate.

## 5. CONCLUSION

Image processing was used to successfully recognize the hand gestures and convert those gestures into audible voice and as well as text also which will be effectively useful for deaf and dumb people. This method will take input as image and gives output as text and speech. This system's execution comes up with 90% accuracy and it will work successfully in the most of test cases.

### Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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