Hand Sign Recognition using Deep Learning based on Machine Learning

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ABSTRACT

Addressing the issues of People with Hearing and Vocal Impairment through a single aiding system is a tough job. A lot of work in modern day research focuses on addressing the issues of one of the above challenges but not all. The work focuses on finding a unique technique based on the machine learning that aids the mute by letting them hear what is represented as text and its sound. The proposed system achieved the technique that takes the sign image through a web camera and applies to the image processing then analysis what exactly want to the mute people at end the text available to voice signals. All these three solutions were modulated to be in a single unique system. All these activities are coordinated using the Ubuntu system using python. The vocally impaired people are helped by the process in which the image to text and text to speech is given using machine learning.

Keywords: Image Processing, Tensor flow Algorithm, CNN Algorithm Process, Languages and compilers, Classification, Verification.

ARTICLE INFO

I. INTRODUCTION

Approximately 285 million people are judged to be visually impaired worldwide in which 39 million are blind and 246 are said have low vision. Approximately 90% of this world's vocally impaired is from the dispirited income people and 82% of people living with blindness aging persons and above. The numbers of people visually impaired from eye related diseases have been brought down in the past 20 years according to global estimated work. In which 80% of all visual restitution can be prevented or cured. India is considered to be the home for the world's largest act of blind people. In this world, about 37 million are blind, in which 15 million are from India. There are so many researches have been getting along in this universe, but the visual impairment could not be broken for good. In lodge to facilitate these people we have developed the assistive device for blind people who does not want the assistance of other neighbours.

Dumber people can simply tilt the message by sign language which could not be understandable by other people. By this system we provide the solution for blind, deaf and dumb people. For blind people the image is converted to voice by using Tesseract software, the deaf people received their content by message as soon as the opposite person speaks out it displayed as a message. The dumb persons conveyed their message through text instead of sign language which is delivered via e speak. We have provided necessary steps to resolve the problems of those masses.

The motivation for a hand gesture recognition is to assist handicapped users. We can provide quality assistance to the physically challenged users, also for senior citizens by devising Image Processing techniques.

It is manual operation. Person's actions are difficult to understand. Sometime persons action or gestures are difficult to recognized as it is tough job. Then in that case communication getting difficult and more inconvenient. Conveying information to be taken more time. It is difficult as well as very time consuming. These are main problems which create disturbance in communication.

II. LITERATURE SURVEY

[1] Sunitha K. A, Anitha Saraswathi.P, Aarthi.M, Jayapriya. K, Lingam Sunny, "Deaf Mute Communication Interpreter-A Review", International Journal of Applied Engineering Research ,Volume 11, pp 290-296 , 2016.

Sunitha K. A1 et al. aims to cover the various prevailing methods of deaf-mute communication interpreter system. The two broad classification of the communication methodologies used by the deaf –mute people are proposed that are Wearable Communication Device and Online Learning System. Under Wearable communication method, Glove based system are used, Keypad method and Handicom Touch-screen. The Online Learning System has different methods like SLIM module, TESSA, Wi-See Technology, SWI_PELE System and Web-Sign Technology. [1].

[2] Mandeep Kaur Ahuja, Amardeep Singh, "Hand Gesture Recognition Using PCA", International Journal of Computer Science Engineering and Technology (IJCSET), Volume 5, Issue 7, pp. 267-27, July 2015.

Ahuja and Amardeep presented a scheme using a database-driven hand gesture recognition based upon skin color model approach and thresholding approach along with an effective template matching.Template based matching technique is developed using Principal Component Analysis (PCA) for recognition. [2].

[3] Sagar P.More, Prof. Abdul Sattar, "Hand gesture recognition system for dumb people",International Journal of Science and Research (IJSR), Volume 3, Issue 2, April 2015.

Sagar P.More & Prof. Abdul Sattar have presented the static hand gesture recognition system using digital image processing. For hand gesture feature vector SIFT algorithm is used. The SIFT features have been computed at the edges which are invariant to scaling, rotation, addition of noise.[3].

[4] Pratibha Pandey, Vinay Jain, "Hand Gesture Recognition for Sign Language Recognition: A Review", International Journal of Science, Engineering and Technology Research (IJSETR), Volume 4, Issue 3, March 2015.

Pratibha Pandey & Vinay Jain have presented various method of hand gesture and sign language recognition in the past by various researchers. With the help of sign language, these physical impaired people express their emotions and thoughts to other person. [4].

[5] Nakul Nagpal,Dr. Arun Mitra.,Dr. Pankaj Agrawal, "Design Issue and Proposed Implementation of Communication Aid for Deaf & Dumb People",

International Journal on Recent and Innovation Trends in Computing and Communication ,Volume: 3 Issue: 5,pp- 147 – 149, May 2015.

Nakul Nagpal et al proposed a system to aid communication of deaf and dumb people communication using Indian sign language (ISL) with normal people where hand gestures will be converted into appropriate text message. Authors design an algorithm to convert dynamic gesture to text at real time.[5].

III. PROPOSED SYSTEM

The great challenge lies in developing an economically feasible system so that physically impaired people can communicate easily.

- Datasheet of all the hand gestures will be made beforehand.
- Then, using python programing the real time picture of sign will be captured and will be compared with the datasheet. (photo captured will be converted into binary image)
- Then python will give the output based on Ubuntu system will be in accordance with the matched picture.
- At the end there is a sound that is being used to generate the voice message.
- There is a speaker through which message can be easily heard.
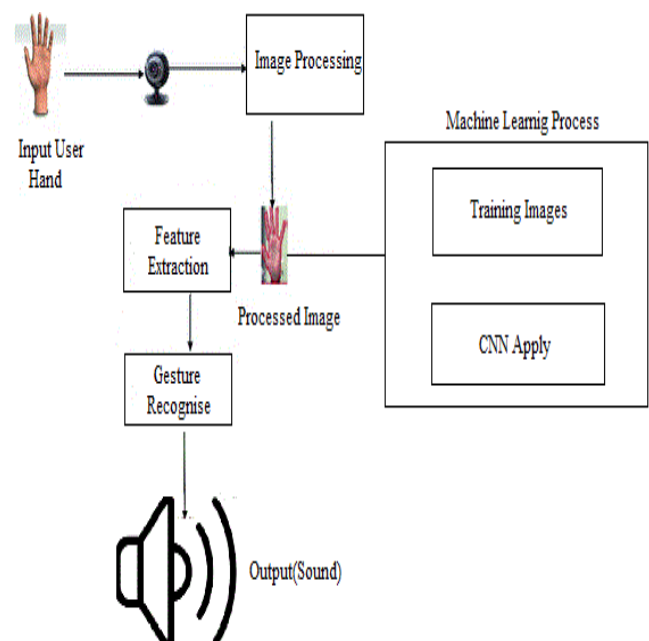

Fig1. System Block Diagram

Basic working algorithm of overall system is as follow

- Classify dataset under labeled folders such as had sign images

- Read dataset
- Read features of all images and label (here name of dataset folder) of it
- Store it in model file
- Get input image
- Read features of input image
- Compare features of stored features
- Show label as prediction of nearly matched features.

IV. CONCLUSION

The implementation of the proposed system aims to translate gestures into speech (voice). The scope of the project 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.

REFRENCES

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[8] Hee-Deok Yang, "Sign Language Recognition with the Kinect Sensor Based on Conditional Random Fields" 2014.