



**PARISUTHAM INSTITUTE OF TECHNOLOGY AND
SCIENCE ,THANJAVUR**

LITERATURE SURVEY

**Real-Time Communication System Powered by AI for Specially
Abled**

TEAM MEMBERS:

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Paper title : Deaf and Dumb Gesture Recognition System

Publication : IJRASET Publications

Author name : Vaibhav Shah

Published on : 12 April 2022

Methodology : Convolution Neural Network

CNN (Convolution Neural Network) feature Comparison: A very known Deep Learning Algorithm “Convolution Neural Network” it is used to extract very high-level data representations of the image content. Rather than pre-processing the data to derive features like textures and shape, CNN takes the image’s raw pixel data as input and learns how to extract these features and ultimately conclude what object they represent. Within Indian Sign Language (ISL), every letter has some symbol. For our machine to understand we take a large amount of images. CNN divides the recorded video in multiple images, these images will be gathered and will assign importance to various aspects/objects in the image and be able to differentiate one from other. Hereafter, the arrangement of images will be done according to the most informative image and they will be organized in a proper sequence and the software will be trained and written - using CNN. These images now are further extracted into frames. These extracted frames will be then compared with the trained model. If the match is found, then the corresponding output will be displayed. Whereas, if the match is not found, then the gesture will not be identified.

Paper title : Sign Language Recognition for The Deaf and Dumb

Publication : IJERT Publications

Author name : Reddygari Sandhya Rani , R Rumana , R. Prema

Published on : 1 November 2021

Methodology : Dataset generation, Gesture classification

Dataset generation

It is required to make a proper database of the gestures of the sign language so that the images captured while communicating using this system can be compared. Steps we followed to create our data set are as follows. We used Open computer vision (OpenCV) library in order to produce our dataset. Firstly, we captured around 800 images of each of the symbol in ASL for training purposes and around 200 images per symbol for testing purpose. First, we capture each frame shown by the webcam of our machine. In each frame we define a region of interest (ROI) which is denoted by a blue bounded square as shown in the image below. From the whole image we extracted our ROI which is RGB and convert it into grey scale Image. Finally, we apply our gaussian blur filter to our image which helps us extracting various features of our image.

Gesture classification

The approach which we used for this project is. Our approach uses two layers of algorithm to predict the final symbol of the user.

Algorithm Layer 1:

1. Apply gaussian blur filter and threshold to the frame taken with open cv to get the processed image after feature extraction
2. This processed image is passed to the CNN model for prediction and if a letter is detected for more than 50 frames then the letter is printed and taken into consideration for forming the word.
3. Space between the words are considered using the blank symbol.

Algorithm Layer 2:

1. We detect various sets of symbols which show similar results on getting detected.
2. We then classify between those sets using classifiers made for those sets only.

Paper title : Sign Language Recognition based on Hands Symbols Classification

Publication : ICCCA Publication

Author name : Naresh Kumar

Published on :17 January 2019

Methodology : TensorFlow

TensorFlow is a free and open-source software library for dataflow and differentiable programming across a range of tasks. It is a symbolic math library, and is also used for machine learning applications such as neural networks. It is used for both research and production at Google. Features: TensorFlow provides stable Python (for version 3.7 across all platforms) and C APIs; and without API backwards compatibility guarantee: C++, Go, Java, JavaScript and Swift (early release). Third-party packages are available for C#, Haskell Julia, MATLAB, R, Scala, Rust, OCaml, and Crystal. "New language support should be built on top of the C API. However, not all functionality is available in C yet." Some more functionality is provided by the Python API. Application: Among the applications for which TensorFlow is the foundation, are automated image-captioning software, such as Deep Dream.

Paper title : Translation of Sign Language for Deaf and Dumb People

Publication : International Journal of Recent Technology and Engineering

Author name : Suthagar S., K. S. Tamilselvan, P. Balakumar, B. Rajalakshmi, C. Roshini

Published on :17 January 2019

Methodology : Otsu algorithm

The Recognition of sign language involves pre-processing level and classification level. Pre-processing level involves gray scale conversion, noise reduction, background subtraction, brightness normalization and scaling operation. The gesture image made by deaf and dumb people is segmented using Otsu algorithm. After the segmentation is done, the database stored is compared with the segmented image taken for testing and the corresponding output will be displayed. It represents the input gesture images for Alphabets such as “A”, “B”, “Y”, “J” and shows the corresponding output for input gesture image

Paper title : Smart communication assistant for deaf and dumb people

Publication : International Journal for Research in Applied computer science

Author name : Ajabe Harshada

Published on : 15 July 2021

Methodology : Convolution Neural Network

CNN for dynamic gestures to achieve faster results with high accuracy. Communication is the medium by which we can share our thoughts or convey the messages with other person. Nowadays we can give commands using voice recognition. But what if one absolutely cannot hear anything and eventually cannot speak. So the Sign Language is the main communicating tool for hearing impaired and mute people, and also to ensure an independent life for them, the automatic interpretation of sign language is an extensive research area. Sign language recognition (SLR) aims to interpret sign languages automatically by an application in order to help the deaf people to communicate with hearing society conveniently