SIGN LANGUAGE RECOGNITION USING ANDROID

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ABSTRACT

The conversation is a very consequential aspect of human life. We meet many people in our day-to-day life with whom we verbalise about arbitrary things, we do consequential discussions on office matters with colleagues. But the conversation only commences when the two persons verbalising between understand each other's language. We live in a society where many people are incoherent and auditorily impaired and are unable to verbalise or heedfully auricularly discern a single word. So how they manage to convey their message to the other person via actions, becomes very arduous to explicate as well as understand the language they utilise to express their feelings. So keeping this in mind we culled this project topic of denotement language apperception which is an android predicated application that avails to apperceive the designation made in front of the camera and show the denouement detected on the screen. This project is made utilising a coalescence of two different technologies that is android and python which is a great amalgamation for implementing a vigorous project.

Keywords: Sign Language, Deaf And Dumb, Conversation, Dataset.

I. INTRODUCTION

The purpose of any language is to convey the message between sender and receiver. In India, there are 270 different languages utilised for communication by people of different cultures. We additionally have a language for auditorily impaired and incoherent people and the language is kenned as dactylology, which is utilised as a symbolic language to express feelings and conceptions of auditorily impaired and imbecilic people. Many sign languages are there for example American Dactylology (ASL), British, Australian, and Incipient Zealand Dactylology (BANZSL), Chinese Dactylology (CSL), French Dactylology (LSF), Japanese Dactylology (JSL), Syllabary Arabic Dactylology (SASL), Spanish Dactylology (LSE), Mexican Dactylology (LSM)
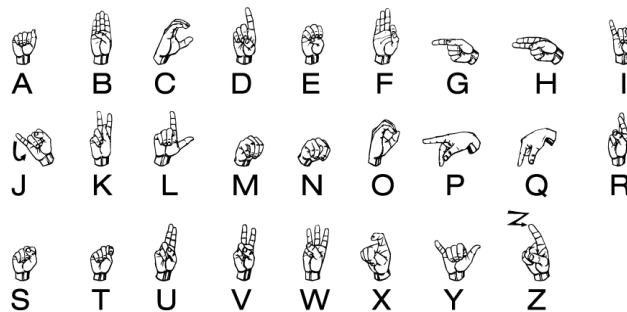

Fig 1: Sign Language Symbols

II. LITERATURE SURVEY

Auditorily impaired Mute Communication Interpreter- A Review [1]: This paper aims to cover the sundry prevailing methods of auditorily impaired-mute communication interpreter system. The two broad relegations of the communication methodologies utilised by the auditorily impaired mute people are – Wearable Communication Contrivance and Online Learning System. Under the Wearable communication method, there are Glove predicated systems, the Keypad method, and Handycam Touch-screen. All the above-mentioned three sub-divided methods make utilisation of sundry sensors, accelerometer, an opportune micro-controller, a text to verbalization conversion module, a keypad, and a physical contact screen. The desideratum for an external contrivance to interpret the message between an auditorily impaired mute and non-auditorily impaired-mute

people can be overcome by the second method i.e., the online learning system. The Online Learning System has different methods. The five subdivided methods are- the SVELTE module, TESSA, Wi-Visually perceives Technology, SWI_PELE System, and Web- Sign Technology.

An Efficient Framework for Indian Dactylology Apperception Utilising Wavelet Transform [2]: The proposed ISLR system is considered as a pattern apperception technique that has two consequential modules: feature extraction and relegation. The joint utilisation of Discrete Wavelet Transform (DWT) predicated feature extraction and most proximate neighbour classifier is utilised to perceive the denotement language. The experimental results show that the proposed hand gesture apperception system achieves maximum 99.23% relegation precision while utilising cosine distance classifier.

Hand Gesture Apperception Utilising PCA in [3]: In this paper authors presented a scheme utilising a database driven hand gesture apperception predicated upon skin colour model approach and thresholding approach along with an efficacious template matching with can be efficaciously utilised for human robotics applications and homogeneous other application. Initially, the hand region is segmented by applying the skin colour model in the YCbCr colour space. In the next stage, thresholding is applied to the dissever foreground and background. Determinately, a template predicated matching technique is developed utilising Principal Component Analysis (PCA) for apperception.

Hand Gesture Apperception System For the Incoherent People [4]: Authors presented the static hand gesture apperception system utilising digital image processing. For hand gesture feature vector SIFT algorithm is utilised. The SIFT features have been computed at the edges which are invariant to scaling, rotation, and addition of noise.

An Automated System for Indian Dactylology Apperception in [5]: In this paper, a method for automatic apperception of designations on the substratum of shape-predicated features is presented. For segmentation of hand region from the images, the Otsu's thresholding algorithm is utilised, which culls an optimal threshold to minimise the within-class variance of threshold ebony and white pixels. Features of segmented hand regions are calculated utilising Hu's invariant moments that are limited to Artificial Neural Network for relegation. Performance of the system is evaluated on the substructure of Precision, Sensitivity, and Specificity.

Hand Gesture Apperception for Dactylology Apperception: A Review in [6]: Authors presented sundry methods of hand gesture and dactylology apperception proposed in the past by sundry researchers. For auditorily impaired and incoherent people, Dactylology is the only way of communication. With the avail of denotement language, these physically impaired people express their emotions and celebrations to others.

Design Issue and Proposed Implementation of Communication Avail for Auditorily impaired & Incoherent People in [7]: In this paper, the author proposed a system to avail communication of auditorily impaired and imbecilic people communication utilising Indian dactylology (ISL) with mundane people where hand gestures will be converted into a congruous text message. The main objective is to design an algorithm to convert dynamic gestures to text at genuine-time determinately after testing is done the system will be implemented on android platform and will be available as an application for keenly intellective phone and tablet pc.

Genuine Time Detection and Apperception of Indian and American Dactylology Utilising Sift In [8]. The author proposed a genuine time vision-predicated system for hand gesture apperception for human-computer interaction in many applications. The system can perceive 35 different hand gestures given by Indian and American Dactylology or ISL and ASL at a more expeditious rate with virtuous precision. RGB-to-GRAY segmentation technique was acclimated to minimise the chances of erroneous detection. The authors proposed a method of improvised Scale Invariant Feature Transform (SIFT) and the same was habituated to extract features. The system is a model utilising MATLAB. To design an efficient utilizer-convivial hand gesture apperception system, a GUI model has been implemented.

A Review on Feature Extraction for Indian and American Dactylology in [9]: Paper presented the recent research and development of denotement language predicated on manual communication and body language. Dactylology apperception systems typically elaborate three steps: preprocessing, feature extraction, and relegation. Relegation methods utilised for apperception are Neural Network (NN), Support Vector Machine (SVM), Obnubilated Markov Models (HMM), Scale Invariant Feature Transform (SIFT), etc.

Sign Pro-an Application Suite for Auditorily impaired and Incoherent. in [10]: The author presented an application that avails the auditorily impaired and incoherent person to communicate with the rest of the world utilising dactylology. The key feature in this system is the authentic time gesture to text conversion. The processing steps include gesture extraction, gesture matching, and conversion to verbalization.
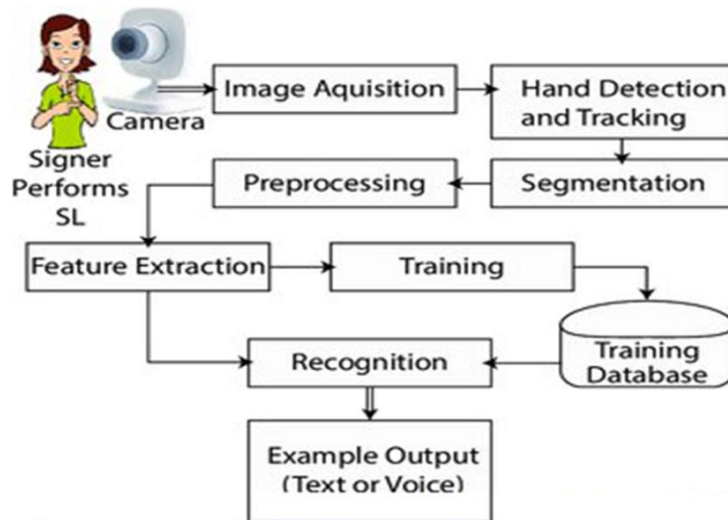
III.   PROPOSED METHODOLOGY

Fig 2: System Architecture

The proposed system is working with two different technologies, the first one is android and the second one is python. Both the technologies have different roles abaft this project. The working of python is defined below:

Step 1: Firstly the image is taken as an input from the mobile camera to the system, after that the hand gesture is captured utilising Open Computer Vision(OpenCV). OpenCV is a highly used python library for operating over images. It is able to integrate multiple operations to any image and get the output.

Step 2: After the hand gesture is recognised it will send the origin image for the segmentation process. Image segmentation is a method where an image is divided into sub parts which helps in reducing the complexity of the image to make further processing or analysis of the image simpler.

Step 3: In this step the preprocessing of the image is done. Image processing is a process where the image gets resized, rotated, and re-arranged. It is the steps taken to format images before they are used by model training and inference.

Step 4: Features of the images are extracted here in this step and combined together with the most relevant options. Feature extraction is a component of the dimensionality abbreviation process, in which an initial set of the raw data is divided and truncated to more manageable groups.

Step 5: Now the training of the images used for datasets begins, training of the dataset includes the feeding of information to the dataset.

Step 6: Now after the training step the dataset is ready to perform recognition using multiple similar images to obtain the result.

Step 7: After the recognition of static hand gesture detection of sign language is performed and in the final phase the result is shown on the screen with a letter detected.
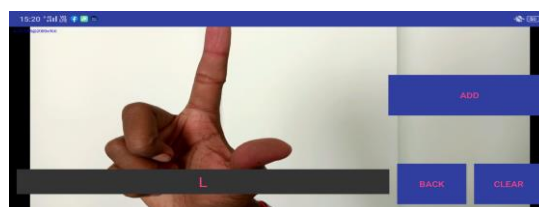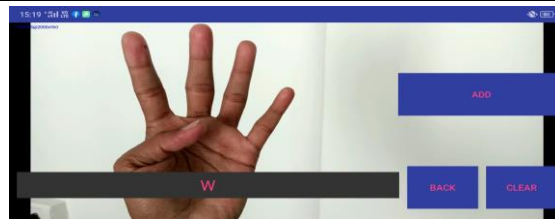
IV.   RESULT

Fig 3: Sign L detected

Fig 4: Sign W detected

V.　CONCLUSION

In this report, a functional authentic-time vision-predicated American dactylology apperception for Auditorily impaired and Incoherent people has been developed for asl alphabets. System is able to ameliorate the prognostication after implementing two layers of algorithms in which the verification and prognosticate symbols are more homogeneous to each other. This way the symbols or sign made with hand gestures is recognised and the results are seen on the screen.

VI.　REFERENCES

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