IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

SIGN LANGUAGE DETECTION USING DEEP LEARNING

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Abstract: Sign language is a somewhat complex language for normal people as they are no longer aware. Therefore, this can be quite difficult when a person is trying to talk to someone with physical disabilities such as the mute and the deaf. So, imagine a technique that will allow you to recognize sign language. without knowing the actual language. This can help people recognize those who are facing physical challenges, a set of rules that uses image processing to detect how the hands are aligned, where this alignment is diagnosed from predefined data sets that we create, and the textual content is diagnosed and then immediately displayed on the screen. it will make them less difficult to see.

I. INTRODUCTION

Deep Learning is playing one of the key roles in today's artificial intelligence tech, and AI was repeatedly criticized by people who are afraid to bring it in market, but AI is redefining people's lives. This project is all about using this tech to help physically challenged people, creating a Deep Learning Model by training it with different types of datasets consisting of various sign languages.

A. Convolution Neural Network

The Convolutional Neural Network (CNN) is an artificial neural community with organic inspection. In comparison to conventional machine learning problems, CNN will get hold of authentic picture's constituent values rather than function vectors.

B. Problem Statement

Deaf people related to mannequins cannot hear or speak clearly, so sign language is the most practical tool. Therefore, there is a utility that supports mobile utilities or web applications, which is more useful. Smooth operation means the use of separate tools, which makes this method impractical and low cost. Not to revise any of the current designations. Therefore, switching to APIs or web/mobile applications is the most practical way to gain access from people all over the world.

II. LITERATURE SURVEY

Deaf Interpreter-Overview: This document introduces various winning strategies for the deaf interpreter system. The portable communication method is mainly based on the device using rectangular gloves. These entries will be entered into the Handicom tool and touch screen method microcontroller, text to speech module, data entry tool and touch screen. The second method, online learning devices overcomes the need for additional external tools to interpret the information between deaf parents and non-deaf parents.

There are special technologies in the information superhighway education system. Five subdivision methods: instant messaging module SL, TESSA, Wi-See technology, SWI_PELE system and Web signature technology. Inexpensive framework for comb conversion for transmitting Indian speech recognition patterns: Take the developed ISLR device as an example, its reputation has two main modules: feature extraction and category. The amazing sharing of Transformed Ridge Reshaping (DWT) is mainly based on feature extraction, and the nearest neighbor classifier is assigned to a known language. Experimental results show that in the Cos mode distance classifier, the projected gesture reputation device can achieve a maximum classification accuracy of 99% and 23%. Reputation is mainly based on the control of the shadow version. Coupling threshold technology and powerful instance matching have been successfully used in human AI packages and similar skill packages. When using the shaded version, the arm area is first divided into shaded YCbCr areas. Later, a threshold will be set to distinguish the foreground from the background. After all, this example mainly relies on the exact matching method, namely the reputation-based pattern subject analysis (PCA). The stupid author's parents abused the static call of the device's virtu Al Photo technology based on gestures.

The SIFT feature vector method is an abbreviation for hand movement. The SIFT alternative method is calculated on edges with constant rectangularity to scale, rotate, and add noise. An automatic Indian language recognition system, used for the specific purpose of this document, in the form of a conceptual computer character reputation. The table is mainly based on alternatives. To segment the arm area of the image, the Otsu threshold method was used, in which an additional precise threshold was selected to minimize the pixel elegance deviation in the black and white doorway.

III. METHODOLOGY

The planned system consists of two main stages:
1) Creating the Dataset 2) Training the Dataset

1) The block diagram (Fig. 1) shows the planned operation of the system. The selection of a hand is a very important criterion for the algorithm to distinguish between hand gestures. These traits have managed to adapt to a completely different hand and gestures for a completely different ensemble. Method The algorithm recognizes the hand and masks the hand in two different colors., black and white and RGB versions. So, when we try to create a dataset, we capture the hand movement and create different images. By recording in different lighting conditions and orientations, the algorithm can learn efficiently when not many data sets are available on open-source platforms such as Kaggle. After that we need to run the algorithm into the record directory and the rest will build a model through the convolutional neural network and of the efficiency with which we are training. Therefore, in our case, the epochs should not be more than seven. Intensive training has produced incorrect results.

2) We have created a dataset of 26 English alphabets with Indian characters. The videos were recorded on a camera, so each video frame was dimmed to a hundred frames and set to 100 frames, increasing the urgency of 250 frames for each character. The data was then divided into 4,800 images training.

3.1 Feature Extraction

All our images, which are marked by KERAS for each letter, are now loaded into the algorithm for the training. Here the algorithm will now retrieve all images in the respective array and then prepare the training for CNN after the training we create the ROI box, in which the hand is recognized as a contour as a foreground object (hand), so that the threshold value of contour is not equal to zero.

3.2 Sign Recognition

Computer Vision OpenCV can acknowledge the orientation of hand within the Range of Interest (ROI) and then an output with corresponding letter is shown based mostly on the hand orientation. Before this the algorithmic program is trained with the datasets and trained a model, therefore equally we will do with differing types of sign languages and can be used sporadically.

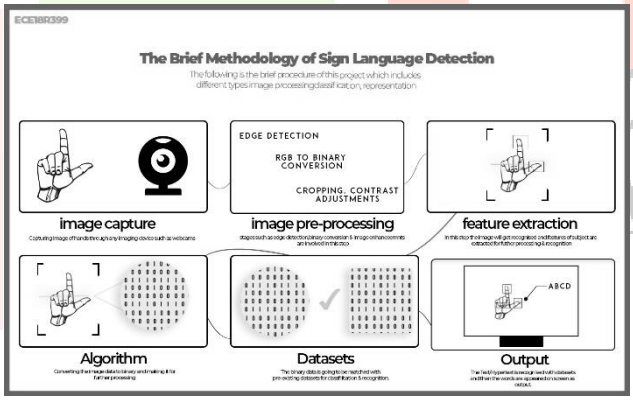

Figure 1 (Up) & Figure 2 *Indian Sign Language* (Below)

IV. RESULTS

4.1 Summarization & Results

S. No	Model Simulated for Sign Languages		
	Name	*Source*	*Epochs*
1.	American Sign Language	Kaggle	5
2.	Indian Sign Language	Kaggle	5

Table 1

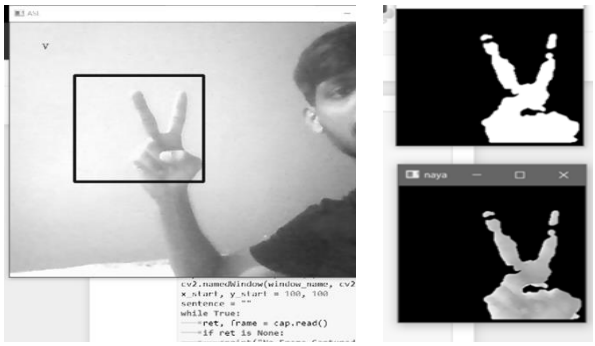

Figure 3

By training the image data set without any enlargement, the training accuracy achieved was high (around 99%), but the important time output did not correspond to the mark. I had predicted wrong most days because the real-time hand gestures weren't exactly centered and aligned vertically. To overcome this disadvantage, we tend to train our model by enlarging our data set with accurate and pixel clear images from readily available datasets from Kaggle (Table 1) and our own datasets and the results are as Fig 3.

4.2 Future Work

Possible extensions to the present project would be extending the gesture recognition system to all or any or any alphabets of the sign language and totally different non-alphabet gestures furthermore. Having used Python because the platform for implementation, we've got an inclination to feel that we tend to will to boot improve upon the speed of our fundamental measure system by committal to writing in C. The framework of this project will be extended to several different applications like dominant golem navigation exploitation hand gestures. The training accuracy dropped to eighty-nine; However, the time predictions were mostly correct. Offline tests with around 9000 enlarged images showed a training accuracy of 92.7%. (As the number of parameters to be trained increases) However, training images with a massive size are directly proportional to the performance of the system machine.

REFERENCES

[1] Singha, J. and Das, K. "Hand Gesture Recognition Based on Karhunen-Loeve Transform", Mobile and Embedded Technology International Conference (MECON), January 17-18, 2013, India, pp. 365-371.

[2] Bhuyan, M. K.,Kar, M.K., and Neog, D.R. "Hand Pose Identification from Monocular Image for Sign Language Recognition", IEEE International Conference on Signal and Image Processing Applications, 2011, pp. 378-383

[3] Singha, J. and Das, K. "Indian Sign Language Recognition Using Eigen Value Weighted Euclidean Distance Based Classification Technique", International I Journal of Advanced Computer Science and Applications, Vol. 4, No. 2, 2013, pp. 188-195.

[4] Admasu, Y. F. and Raimond, K. "Ethiopian Sign Language Recognition Using Artificial Neural Network", 10th International Conference on Intelligent Systems Design and Applications, 2010, pp. 995-1000.

[5] Chou, F. H., and Su Y. C. "An encoding and Identification Approach for the static Sign Language Recognition", IEEE/ASME International Conference on Advanced Intelligent Mechatronics, July 2012, pp. 885- 889.

[6] Gweth, Y.L., Plahl, C. and Ney, H. "Enhanced Continuous Sign Language Recognition using PCA and Neural Network Features", IEEE, 2012, pp. 55-60.

[7] Starner, T. and Pentland, A. "Real-Time American Sign Language Recognition from Video Using Hidden Markov Models", IEEE, 1995, pp. 265-270.

[8] Paulraj, M. P.,Yaacob, S.,Azalan, S. Z. and Palaniappan, R. "A Phoneme Based Sign Language RecognitionSystem Using Skin Color Segmentation", 6th International Colloquium on Signal Processing & Its Applications (CSPA), 2010, pp. 86-90.

[9] Liang, R. H. and Ouhyoung, M. "A Real-time Continuous Gesture Recognition System for Sign Language", IEEE International Conference on Automatic Face and Gesture Recognition, 1998, Japan, pp.558-567.

[10] Tsai, B. L. and Huang, C. L. "A Vision-Based Taiwanese Sign Language Recognition System", IEEE International Conference on Pattern Recognition, 2010, pp. 3683-3686.

[11] Ghotkar, A. S., Khatal, R., Khupase, S., Asati, S. and Hadap, M. "Hand Gesture Recognition for Indian Sign Language", International Conference on Computer Communication and Informatics (ICCCI), Jan. 10-12, 2012, Coimbatore, India.