IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

Survey on Sign Language Detection Application

Mr. Suraj Adsul, Mr. Amit Dighe, Mr. Saurabh Wankhede, Ms. Sonam Borhade
Department of Computer Engineering,
Sinhgad Institute of Technology and Science, Narhe, Pune, Maharashtra, India

Abstract: *Neural networks, as its name suggests, is a machine learning technique which is modeled after the brain structure. It comprises of a network of learning units called neurons. These neurons learn how to convert input signals (e.g. picture of a cat) into corresponding output signals (e.g. the label "cat"), forming the basis of automated recognition. A convolutional neural network (CNN, or ConvNet) is a type of feed¬forward artificial neural network in which the connectivity pattern between its neurons is inspired by the organization of the animal visual cortex.*

Keywords: CNN, Sign Language, Gesture Recognition, OpenCV, ROI, Relu, Silhouette, Pooling, Histogram.

I. Introduction

Deep Learning is a subfield of machine learning concerned with algorithms inspired by the structure and function of the brain called artificial neural networks. There have been several advancements in technology and a lot of research has been done to help the people who are deaf and dumb. Aiding the cause, Deep learning, and computer vision can be used too to make an impact on this cause. This can be very helpful for the deaf and dumb people in communicating with others as knowing sign language is not something that is common to all, moreover, this can be extended to creating automatic editors, where the person can easily write by just their hand gestures. In this sign language recognition project, we create a sign detector, which detects numbers from 1 to 10 that can very easily be extended to cover a vast multitude of other signs and hand gestures and can also include the alphabets. We have developed this project using OpenCV and Keras modules of python.

II. Related Work

1. Alaa H Al-Obodi, built a saudi sign language recognition system.
2. Sadhana Bhimrao Bhagat, proposed vision based sign language recognition.
3. Sanjay Kumar Nayak, proposed Hand Gesture Recognition using Computer Vision
4. Akshay Goel proposed Sign Recognition and Speech Translation Using OPENCV

III. Literature Review

Our proposed system is Sign language detection application using CNN. In our system we use CNN i.e. Convolutional Neural Network algorithm for training the dataset and extraction of data through input.In our system we take live input through the camera and the sign is detected and then output is shown as its meaning. Various existing techniques and algorithms are described in following table.

Sr No.	Paper Title	Advantages	Disadvantages
1	A new framework for sign language alphabet hand posture recognition using geometrical features through artificial neural network	Accuracy of 99 percent, the proposed model is efficient, precise and robust	Higher time complexity due to iterative nature of algorithms
2	Real time Finger Tracking and Contour Detection for Gesture Recognition using OpenCV	Interaction with machines by the users can be through facial expressions, head, voice, hand, touch, etc.	Requirement of more analysis for specific features.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

3	Sign Language Translator Application Using OpenCV,	Accuracy of over 80% and reaches accuracies of over 95% on segmented sign recognition	Non-adaptive filter is also more useful then adaptive filter
4	Study of vision based hand recognition using indian sign language	The dataset has been collected for alphabet from the video by extracting frames and for numbers	It has been created manually from deaf and dumb students of NGO
5	ASL Recognition with MediaPipe and Recurrent Neural Networks,	Accuracy of 92%, in real time, and with a mobile phone or computer camera	The approach introduced in this paper is totally depending on the shape parameters of the hand gesture
6	Sign Recognition and Speech Translation Using OPENCV	A way is suggested to convert ASL into human understandable language	This approach removes the dependent features of image
7	Hand Gesture Recognition using Computer Vision,	The methods of analysing, modelling and recognizing hand gestures in the context of the HCI is provided	None found yet
8	A Survey on Sign Language Recognition Systems	Two methods. First one is sensor based technique,second approach involves computer vision based methods.	There is less accuracy89.78 percentage.
9	Vision based sign language recognition: a survey	Real time images will be captured first and then it stored in the directory and on recently captured image and feature expulsion will take place	The method has been developed with respect to the single user
10	A Saudi Sign Language Recognition System based on Convolutional Neural Networks	Constructed a dataset of 40 Saudi signs with about 700 images for each sign.	Requirement of more analysis for specific features.

Table 1: Literature Review

IV. CONCLUSION

With this application a person will quickly adapt various gestures and their meaning as per ASL standards. They can quickly learn what alphabet is assigned to which gesture. Add-on to this custom gesture facility is also provided along with sentence formation. A user need not be a literate person if they know the action of the gesture, they can quickly form the gesture and appropriate assigned character will be shown onto the screen.

REFERENCES

[1]. Hoshang Kolivand, Saba Joudaki, Mohd Shahrizal Sunar, David Tully ”A new framework for sign language alphabet hand posture recognition using geometrical features through artificial neural network” ,International Journal of Engineering Research and Technology (IJERT), (19 August 2020)

[2]. Ruchi Manish Gurav, Premanand K. Kadbe ”Real time Finger Tracking and Contour Detection for Gesture Recognition using OpenCV” ,International Journal of Engineering Research and Technology (IJERT), (2016)

[3]. LTriyono, E H Pratisto, S A T Bawono, F A Purnomo, Y Yudhanto and B Raharjo, “Sign Language Translator Application Using OpenCV”, International Journal of Computer Science and Telecommunications, (2017)

[4]. Archana S. Ghotkar and Dr. Gajanan K. Kharate, “STUDY OF VISION BASED HAND GESTURE RECOGNITION USING INDIAN SIGN LANGUAGE ”, International conference on emerging trends in science (2014).

[5]. Antonio Domenech L. ,” ASL Recognition with MediaPipe and Recurrent Neural Networks ”, International Journal of Artificial Intelligenceand Interactive Multimedia, Vol. 2, No 2.,(28. July 2020)

[6]. Akshay Goel1, Raksha Tandon2, Mandeep Singh Narula3, “Sign Recognition and Speech Translation Using OPENCV”, AIEEE, Vol. 15 No. (Nov 2020)

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 3, May 2022
Impact Factor: 6.252

[7]. Ashutosh Samantararay, Sanjay Kumar Nayak, Ashis Kumar Mishra, "Hand Gesture Recognition using Computer Vision",(2013).

[8]. Shruty M. Tomar, Dr. Narendra M. Patel, Dr. Darshak, G. Thakore "A Survey on Sign Language Recognition Systems", Conference: 2013 Fourth International Conference on Computing, Communications and Networking Technologies (ICCCNT) ,(3 March 2021).

[9]. Sadhana Bhimrao Bhagat, 2 Dinesh V. Rojarkar, "Vision based sign language recognition: a survey ", (January 2017)

[10]. Alaa H Al-Obodi, Ameerh M Al-Hanine, Khalda N Al-Harbi, Maryam S Al-Dawas, and Amal A. Al-Shargabi, " A Saudi Sign Language Recognition System based on Convolutional Neural Networks", (2020)