



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 4, April 2023

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

 9940 572 462

 6381 907 438

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Sign Language to Text Conversion

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ABSTRACT: Sign language is one of the oldest and most natural form languages of communication, but most people don't know it and it's very difficult to find an interpreter, so we came up with a real-time method using neural networks. sign language. In our method, the hand is first passed through a filter, and after applying the filter, it passes through a classifier that predicts the hand movement class. Our method provides 95.6% accuracy for the 26 letters of the alphabet.

KEYWORDS: CNN, Tensorflow, Artificial Neural Network (ANN)

I. INTRODUCTION

American Sign Language is the predominant sign language Since Deaf and Mute (referred to here as D&M) people have only communication disabilities, and because they cannot use spoken languages, sign language is their only means of communication. Communication is the process of exchanging ideas and messages through various means such as speech, signals, behavior and visuals. D&M people use their hands to express various gestures to express their thoughts to other people. Gestures are non-verbally exchanged messages and these gestures are understood by sight. This non-verbal communication of deaf and mute people is called sign language. Sign language is a language that uses gestures instead of sound to convey meaning combining hand shapes, orientation and movement of hands, arms or body, facial expressions and lip patterns. Contrary the to popular belief, sign language is not said to be international. These differ from region to region.

II. RELATED WORK

For interaction between normal people and D&M people a language barrier is created as sign language structure since it is different from normal text. So, they depend on vision-based communication for interaction.

If there is a common interface that converts the sign language to text, then the gestures can be easily understood by non-D&M people. So, research has been made for a vision-based interface system where D&M people can enjoy communication without really knowing each other's language.

The aim is to develop a user-friendly Human Computer Interface (HCI) where the computer understands the human sign language.

There are various sign languages all over the world, namely American Sign Language (ASL), French Sign Language, British Sign Language (BSL), Indian

Sign language, Japanese Sign Language and work has been done on other languages all around the world



III. METHODOLOGY

First, we capture each frame displayed by our machine's web camera. In each frame, we define a region of interest (ROI), which is marked by a blue bounded square, as shown in the image below:

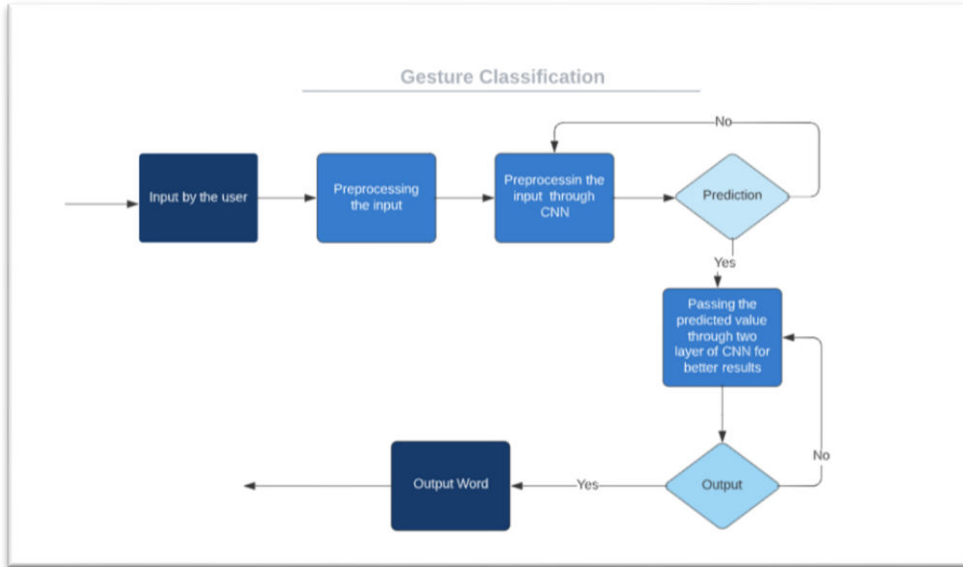


Then, we apply a Gaussian blur filter to our image which helps us extract various features of our image. After applying the Gaussian blur, the image looks like this:

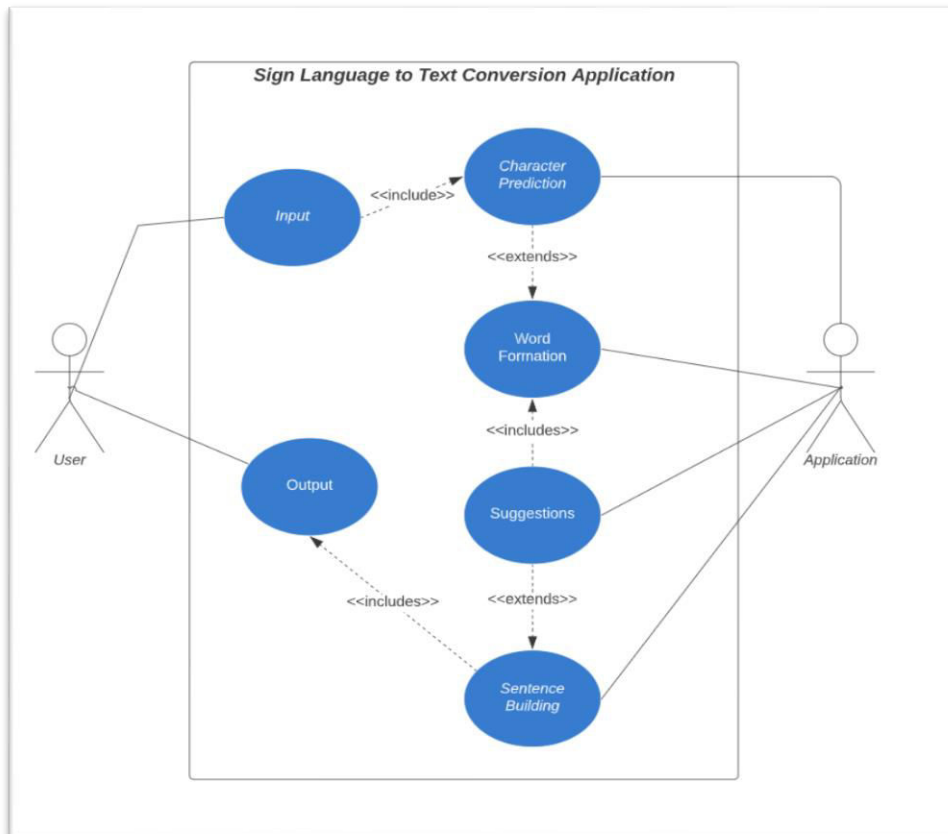




The flow chart for gesture classification is as follows:



The Application Working Diagram is as follows:





IV. CONCLUSION

This report creates a real-time visualization that D&M people use to recognize American Sign Language for the original alphabet.

We achieved final accuracy of **98.0%** on our data set. We have improved our prediction after implementing two layers of algorithms wherein we have verified and predicted symbols which are more similar to each other.

This allows you to identify almost any character if the character is displayed correctly, there is no background noise, and the lighting is sufficient.

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