# Recognition of Hand Movement for Paralytic Persons Based on a Neural Network

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## ABSTRACT

*Report in 2010 according to word health organization, there are more than 17,000,000 people infected with stoke yearly in all countries of the world as a result of the brain injury and prevent damage to the blood supply to the brain which leads to the injury that the patient is suffering of total paralysis or paraplegia and not able to do regular activities itself. Paralysed person loss of muscle function in part of body.it happens when something goes wrong with messages pass between brain and muscles in their body and in india the stroke rate is higher compared to other countries. To help the stoke patients out of its researchers have found a solution by creating hand gesture or sign that will help them perform daily functions easily and to for well communication with normal person. If paralysed patient wants to eat or something else, the system helps him to achieve what he wants. This method is the good way to help to the stroke patients and what they need , they want to eat or want to say something when the patient unable to walk due to stroke, and what feeling in complete paralysis, except his hands The Hand Gesture (HG) has become an alternative input devices such as a mouse and keyboard. The main aim is to read and detect the hand gesture by using high resolution cameras and process the image using convolution neural network by the process of edge detection. The proposed model is built by using convolutional neural network (CNN).*

**Keyword:** *Hand gestures, CNN, Edge Detection*

## 1. INTRODUCTION

Humans are able to understand and recognize body and sign language. The hand gesture is a mode of communication in which the motion of the hand can be recognized. The aim of hand Movement recognition of a paralytic person can be done through edge detection. In this way, we can easily recognize the hand gesture of a paralytic person. Hand signal is considered a issue since motions move among people and for the same individual depending on various settings. It keep track of various hands parameters and provides data to analysis it and monitor system.It is depend on gestures language Interpreter of the patient. The difficulties in this innovation are lightning conditions and quick hand developments. The practical implementation of hand Movement recognition requires devices like high-resolution cameras to track hand movements. In this process, we must deal with many problems like identifying gestures, illumination changes, hand movement, complicated background, and selfocclusions. This paper describes the hand movement recognition of a paralytic person using a convolution neural network where the system gets trained by both the input and the output based on edge detection. The system is

trained with a real-time dataset obtained from the high-resolution cameras. Input from the high-resolution cameras is compared to the training set given to the system. This system have general facility due to its depend on monitoring the patients in different regions. If paralysed patient wants to eat or something else, the system helps him to achieve what he wants. . This method is the easiest way to help the patients and what they need ,when the patient unable to walk due to stroke, and what feeling in complete paralysis, except his hands. Then the system completely depend on hands movements.The details of system consist of digital camera connects with active system to monitor closely the SP.The idea of he system is to monitor the patient's hands.

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## 2. LITERATURE SURVEY

Basically a disable person or paralysed person can not from one place to another place. The paralyse person is weak that can't press any button and most of them can't walk and many researchers with researches to help these persons to do his daily jobs. The system has come up with many functionalities which describes a neural network using simple pixel counting analysis back propagation learning , artifial neural network, MATLAB with GUI, python and all othermethods for this purpose. It is an desktop software and which has intension todetect of the hand gesture of a paralytic person where he/she is bedriddenand can only move their hands by this method,it can help them in their day today activities. The some related system has introduced a continuous hand motion acknowledgement framework. Such framework comprises three phase-picture obtaining include extraction and acknowledgement. The program is developed in Matlab for a neural network to recognize the number of fingers in front of a web camera. All these gesture images are strored in the database. This software trouble free to use in hospitals or at home. It can be customized as per the need. It can be used in private and government Hospitals The proposed system is very secure. Results will be very precise and accurate and will be declared in very short time span.

Many softwares of hand gesture recognition have been introduced in many latest years. Below, review some of them

Bhushan Bhose et al [1], describes a Neural network using simple pixel counting analysis. This recognizes the number of fingers in front of the web camera and does counting analysis. The hand signal acknowledgment framework has advanced enormously in an ongoing couple of years. This is a direct result of its capacity to cooperate with machine productively and made simpler for the confined to bed patient to utilize. The literature review conveys many methods used by the authors such as simple pixel counting analysis, back propagation learning, artificial neural network, MATLAB with GUI, python and all other methods for this purpose.

D. Gawande et al.[2], presented neural network-based hand gesture recognition. Here, the Neural network is been classified by backpropagation learning algorithm and edge detection. The neural system is based on the order by utilizing back engendering learning calculation. American sign language is recognized. Edge detection is used. It can be used in only high-level computation and not in a low-level computation model.

Tasnuva Ahmed al. [3] he had introduced a continuous hand motion acknowledgment framework. This framework comprises three phases: picture obtaining, include extraction, and acknowledgment. The program is developed in Matlab for a neural network to recognize the number of fingers in front of a web camera. Web camera gives images of lower quality. A simple pixel counting analysis algorithm is used. Run time errors are more due to Matlab so we are switching to python.

Do-Chang Oh and Yong Un Jo (2021): Classification of Hand Gestures Based on Multi-channel EMG by Scale Average Waavelet Transform and Convolutional Neural Network.

## 3. SYSTEM ARCHITECURE

In this fig there are steps that we are going to use for Recognition of Hand movement. Firstly , by high resolution camera image wiil be capture than data preprocessing , hand tracking and color detection, feature extraction, and then finally filtering and Gesture will be recognize.

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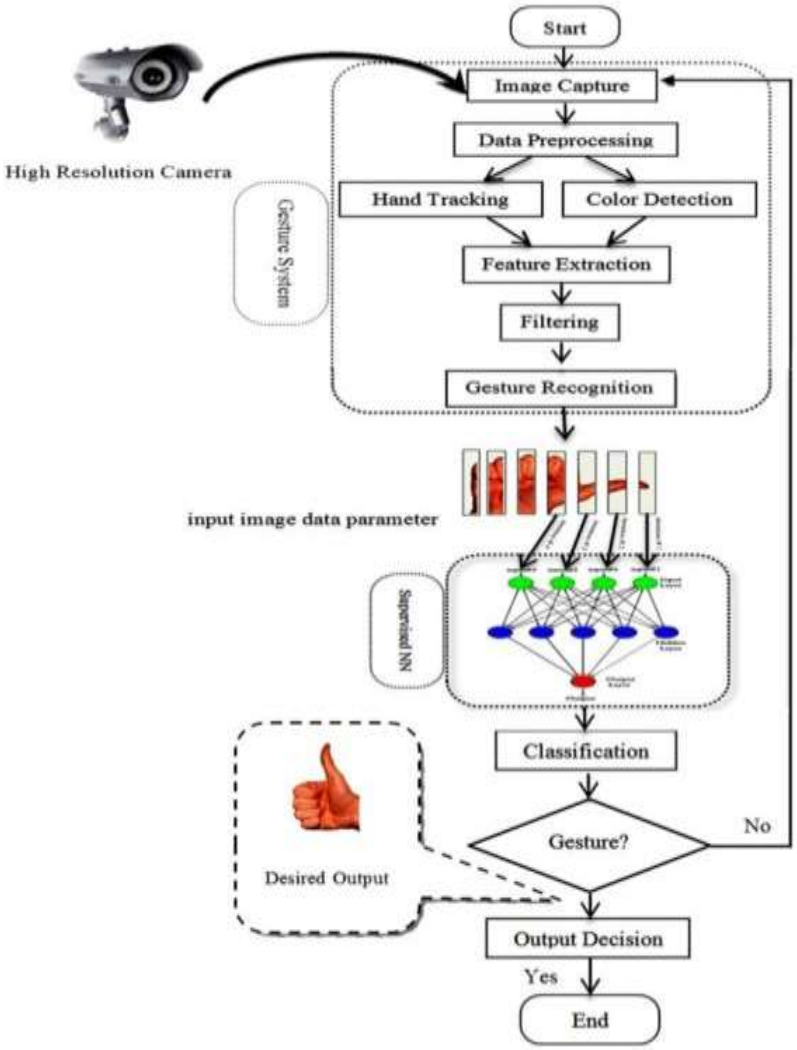


**Fig- 1: System Architecture**

### 1.1 High Resolution Camera

The images of the hand movement are gathering from High resolution camera. This image is in RGB form. Color transformation structure for the RGB image is created, and then, RGB form image will be convert into grayscale format.

### 1.2 Data Pre-processing

It is step in which the data gets transformed, or Encoded ,to bring it to such a state that now the machine can easily parse it i.e.Hand tracking and color will be detected. Image is extract done using the smoothing filter. Image enhancement is carried out for increasing the contrast.

### 1.3 Convolution Neural Network

We propose a convolution neural network methodto recognize hand movements of human task activities from a camera image. To achieve thi robustness performance , the skin model and the calibration of hand positon and orientation are applied to obtain the training and testing data for the CNN

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### 1.4 Feature Extraction

Feature extraction plays an important role for identification of an Hand signals.In many application of image processing feature extraction is used. Color, texture, morphology, edges etc.This is the feature which can be used in Recognition of hand movement.

## 4. CONCLUSIONS

In this paper, we center around the idea of hand movement recognition. Data pre-processing step gives the most noteworthy presentation. Edge recognition is utilized to make the framework too touchy to even consider shifting close by position in info pictures. This technique can be made a technique which is especially faraway patients . At this time, this technique can be controlled by remote. So in any case of disaster like earthquake , if the person is in danger and can't get a help , he can show HG algorithm the system that will interpret it and send it as a signal to transceiver nearby and it will forward the signal toward the rescue team in the control room.The performance of the proposed method depends upon the result of hand detection. If there are moving objects with the color similar to that of the skin, the objects exist in the result of the hand detection dataset and then the performance of the hand gesture recognition. However,the machine learning algorithms can discriminate the hand movement from the background. A neural network is one of the most efficient ways to reduce the rate of errors. The main idea of this research is to implement a system that will help to communication between normal people and paralysed or deaf people who can not talk if they need help and want something from normal people, using hand gestures as the control commands they can easily communicate.and understand together. In the future, the hand signal acknowledgment calculation will be improved.

## 5. REFERENCES

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