



## HUMAN BEHAVIOR RECOGNITION BASED ON CONVOLUTIONAL NEURAL NETWORK (CNN)

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**Abstract:** Individually working up on collection of human behaviour identification structure supported the Convolution Neural Network created for the precise behaviour of human in publicly places. Essentially, a video with some behaviors of human information sets are divided into pictures. Subsequently, we have a tendency to method all the pictures by using a vigorous mechanism called background subtraction which detects the changes in order of images that helps in finding many applications. For instance the coaching information set area unit are up skilled with an outline of CNN model, and the deep learning networks are made of random Gradient descent used for updating the framework of our model. Ultimately, assorted behaviors with samples area unit are systematized and known with the acquired system replica. Therefore, area unit will equate the present thought ways. Upshot displays that Convolutional Neural Network will analyse the human behaviour model mechanically and determine the behaviour of human without any metadata.

**Keywords:** Human Behavior recognition, Convolutional Neural Network.

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### I. INTRODUCTION

A short time ago, with fast expansion of science and technology and video signal assorted technology, human behavior identification supported laptop vision has attracted a lot of and a lot of attention supported. On considering Behavior hiring in laptop vision to find, track, analyze and monitor human activity.

A broadcast image supported is that the automation within the field of self-regulating management as well as pattern recognition. Intelligent watching is geared towards the victimization of the personal computer outside image data into a digital signal, and so through a sequence of computation rather than human brain process and awareness of perceptible data, thus on notice the intelligent recognition and instinctive analysis of observance image.

Nowadays scientists in addition as researcher's reception far and wide with regard to interpretation as well as acknowledgement of human identifications in broadcast police work have settled heaps of labor. The recognition

or identification strategies are often classified within 2 categories: Behavior recognition technique supported identical framework including Behavior identification technique in view of state-space representation. Recognition behavior technique supported identical matching alludes with the primary that will setup an honest depiction example series that indicates unchanged prescribed behavior of the material, later it will go with object broadcast image series detection within the

example and if the matching is successful the behavior is suppose to possess identical features, then the example either recognition are resolved but previously mentioned behavior is poor.

The technique of human behavior identification supported representation of state-space that describes a particular masquerade report, there upon the reports are joined by the method out of chance. A short time ago, Machine learning by neural networks could be a study that is highly regarded, Because Deep learning is used for solving complicated problems when a data set is

dissimilar and correlated. Here pictures are often directly used because the computer file divert and bypass knowledge remodeling then eradicate the complicated method within ancient identification algorithmic program.

Classification of machine learning called Deep learning implicated with many algorithms which fascinated several analysts to review in scope of laptop illusion was more productive. Particularly a short while ago, algorithms based on deep learning algorithms are used for specified sort of semantic networks. success applied in numerous departments likewise image recognition, speech recognition, step by step expanded to analysis on behavior identification with statistic. During documentation a technique supported Convolutional Neural Network has been projected. The unsupervised learning system is been accomplished through the human behavior knowledge collection and semantic network otherwise called as deep learning network is validated. The experimental results show that the network will establish numerous behavior adequately, as a substitute with rate of recognition that is enhanced.

## II. LITERATURE SURVEY

Now a days we have many approaches for human behavior detection. Advanced techniques of object detection using deep learning, which can detect powerful process and process of image data with minimal delay. In this section, we focus primarily on object recognition techniques to take advantage of intensive learning.

[1]Lecun et al. The main goal is to implement a back-propagation (BP) algorithm using a multi-level network to detect handwritten zip codes without reducing its computing power.

[2]In 1998,LeNet-5 model was proposed by LeCun et al. which is the formal formation of the CNNs.

[3]Girshik et al. Although DPM has 43% MAP in Pascal VOC2007, Clumsy Part Models (DPMs) can be made into CNN.

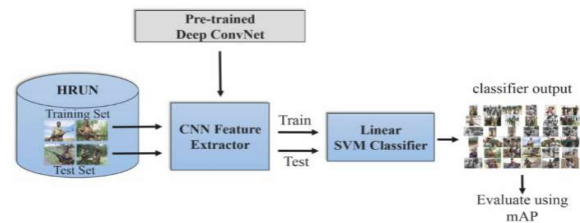
[4]The spatial pyramid pooling network (SPP-NET) uses CNN to improve R-CNN by sharing calculations. The SPP method abolishes the crop or warp image normalization process to resolve data loss and storage problems caused by image distortion and spatial pyramid pooling to replace the last deposited layer before the fully connected layer.

[5] This method effectively solves the problem of duplicate calculations of decision layers and speedups 100 times greater than R-CNN during testing. SPP-Net also has several disadvantages: Like R-CNN, SPP-Net is also multi-platform. During training and facilitation, the pipeline must be written to disk.

## III. PROPOSED SYSTEM

We scheduled a system that will detect the suspicious behavior of common people such as walking, having a fight within exceedingly group, revolutionary team like terrorist attack applying CNN Algorithms. Once it record each and every uncertain behavior of people or any threatening object that cause harm to the people it will take picture and it will generate the alert that can make the person to escape from the suspicious activity. Uttermost of our practice will be concentrated on ML known as machine learning to train the system to spot varied suspicious scenarios. CNN model is used to learn visual representation on human behavior based on image processing stages. CNN works by placing image as input. CNN's algorithms can be applied on these images. Image can be reduced into pixels and perform feature extraction. Here we can identify the threats happening to the blind people by detecting the threatening objects, and we can alert them and it can be used as a surveillance.

## IV. SYSTEM ARCHITECTURE

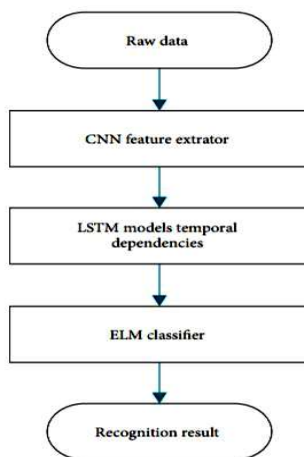


**Fig 1 : Overall Behavior Recognition structure**

In this system design first block explains regarding coaching sets and check set. In terms of selecting segmentation of image size, very depends on what kind of classification you're interested, supported your task you opt to settle on that network to use then supported your modify the image size. If we would like to use CNN for a classification task you ought not to have necessary to segmentation and a unreal box round the concerned region can be enough. The CNN is best for image classification. you've got to involved regarding what technique you're mistreatment to coach the CNN that's the foremost vital. For each info, information is kept principally in 2 classes. Model is trained on coaching set and are tested on new information that are accessible in Testing set. The info isn't tagged in Testing set. In trendy approach information are kept in coaching set and Testing set. Linear SVM is used for consecutive to separate the information.

### V. METHODOLOGY

There are lots of methods to detect the human behavior recognition. We planned a system which is ready to process off-line further online video surveillance for detecting suspicious activities supported a personality's behavior. We have to collect the data in a certain order, human gestures like walking, sitting, standing, running etc are included in the collected at Feature extraction starts from an initial set of measured data and builds derived values intended to be informative. Image based human behavior detection can automatically give difference between normal human behavior and intense human behavior within the scope of video surveillance by detecting important characteristics just like the speed of the anatomy during movement, the dynamic characteristics of limb changes, and so the motion trajectory. This technology has been widely utilized in intelligent video surveillance systems. The collected data can be reduced into pixels. Convolutional network structure during this paper, a whole of seven layers, a connecting layer and an output layer. First, the input video data in accordance with the strategy of section second of the processed image, then a convolution of adjacent four successive images, the second layer is the largest under sampling layer, layer convolution kernel after de convolution on a layer of feature map through the 3 volume layer finally fully connected layer processing using softmax regression model classification. Validation and testing can be done on trained dataset to give the actual output.



**Fig 2 : Model of Convolution layers, Models and ELM Classifier**

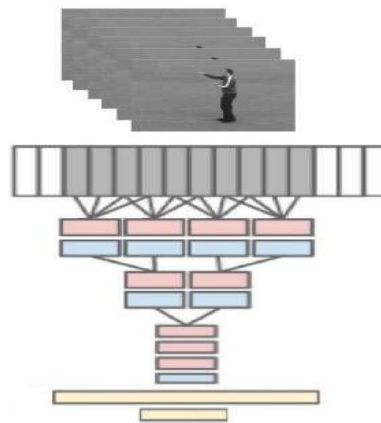
### VI. APPLICATIONS

- To notice the weird crimes in specific setting.

- Maybe utilized in jewellery retailers ,Colleges, ATM s.
- Used for police investigation suspicious behavior.
- It will assess the emotional and physiological states of their babies and oldsters throughout play.

### VII. RESULT ANALYSIS

Throughout this paper convolutional network structure has seven layers together with five volumes of sediments from three sampling layers and connecting layer associate degree an output layer. First we should input video data with the action of second section of the processed image then a convolution of next four another images. In this process second layer is the largest layer, finally fully connected layer processing will be done by using softmax regression model classification.



**Fig 3: Convolutional Neural Network structures**

A broadcast is splitted into coaching set by validating every video. The training set is trained to construct the network and then it is shared to test set. Finally all together forms the behavior. At the identical time, between walking, running and jogging that is enclosed by a video frequency and height variations, In order to upgrade the difficulty of popularity for this technique the popularity rate remains good.

(%)	boxing	clapping	waving hand	jogging	running	walking
boxing	83	17				
clapping	8	92				
waving hand	11		89			
jogging				94	3	3
running				3	96	1
walking						100

Fig 4: Algorithm with Recognition Rate

### VIII. CONCLUSION AND FUTURE WORK

Here in the present paper work, we are using a deep learning based technique to attain the human behavior detection. In this project we use CNN model as a deep learning method. It helps to detect a real time human behavior. Anyhow we use Graphics processing unit or Central processing unit accelerations can be used during testing and training process, hence time is saved by using this acceleration. However with the different hyper parameters can affect the final result. So we should decide a proper hyper parameter to fine tune the model. In future work we should be extent the CNN detection method and finally we will implement deep learning which shows the abilities to detect human behavior and classifies each

[7] R. Girshick. Fast R-CNN. IEEE ICCV, pages 1440–1448, 2015.

object into the right class to achieve higher performance of human behavior detection with the help of deep learning techniques.

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