International Journal of Technical Innovation in Modern Engineering & Science (IJTIMES)
Impact Factor: 5.22 (SJIF-2017), e-ISSN: 2455-2585
Volume 4, Issue 09, September-2018

DETECTION OF MOVING OBJECT USING HYBRID APPROACH

[1]Lovepreet Kaur, [2]Supreet Kaur

[1,2]*PURCITM, Punjabi University, India*

ABSTRACT- ***This research work represents a method for detection of moving objects. The main focus of this research paper is to reduce the time and improve the accuracy of object detection with the help of various approaches. In this research work Back propagation method, FCDH, CDH and NN is being used to improve the accuracy and time of object detection. Moreover, precision and mean square error are two parameters which have been also used in this work. The proposed work has been tested with different complex scenes of some benchmark, openly accessible video arrangements. It shows the better execution of the cutting-edge foundation subtraction methods accessible in the writing regarding order precision measurements. Although, detection of real shapes of the objects is really difficult dare due to various problems like vegetation, ripple water, fountains, illumination variation, cloudy situations and bootstrapping problem. To resolve the effect of the problems and researchers have proposed various approaches.***

INDEX TERMS-Back propagation, fuzzy color dimensional histogram, and neural network.

I. INTRODUCTION

Video Supervision has been in use for monitoring secure sensitive areas for banks, stores, traffic monitoring on high-ways, shopping malls which are rushed. MOD (Moving Object Detection) algorithm is used to identify a moving object like vehicles and human etc. Various techniques that are used to identify the moving objects like Gaussian Mixture Model, Temporal Differences and Optical-Flow etc. On the other hand, there is few drawbacks of these techniques are as follow: (i) Gaussian Mixture Model: There are small modification is requiring for superior output in real-time video especially in traffic video surveillance system (like cloudy, sunshine, night, windy). (ii) Optimal Flow: Algorithm the main condition is that the camera should be motionless. If the camera is moved then result may be false.

To overcome these problems we use different techniques in this research are as follow:

(i)Background Subtraction Method: It is a new technique for tracking objects from static digital cameras. The experiments in BGA (background subtraction algorithm) are still outlying form being resolved due to the subsequent details: (i.)Dynamic backgrounds like sea waves, moving curtains and water flowing etc. (ii.)Pixel feature of foregoing instance might similar to build the background subtraction algorithm [2].

(ii)Color Dimensional Histogram: Color dimensional histogram is an original characteristics are that it quality amounts the perceptually uniform color dimensional between binary (1, 0) pixels. The color dimensional is evaluated in a small local features and edges of RR*RR which is defined by:

$$\text{Dd (mm,nn)} = \frac{\sqrt{\sum_{pp=mm-\left[\frac{RR}{2}\right]}^{mm+\left[\frac{RR}{2}\right]} \sum_{qq=nn-\left[\frac{RR}{2}\right]}^{nn+\left[\frac{RR}{2}\right]} \sum_{chh} \left(II(mm,nn,chh)-II(pp,qq,chh)\right)2\ )}}{RR*RR} \quad \text{..... (i)}$$

The Color Dimensional dd, is fuzzified acc. To the Gaussian filtration membership method.

$$\mu dd(mm,nn) = e^{-\frac{1}{2}\left(\frac{dd}{\sigma}\right)2} \quad \text{..... (ii)}$$

Where $\sigma$is the SD (Standard Derivation) [3].

(iii)Fuzzy Color Difference Histogram (FCDH)

We implemented a robust fuzzy color difference histogram by identifying the fuzzy clustering technique and color dimensional histogram which is defined below:

The clustering method is used to identifying the Neural Network local histogram XX = { xx1,xx2 ,……xxn} into cc clusters or groups, each centroid at VVi. The containers are implemented to individual group/ cluster using Fuzzy membership method. It is verified by iteratively optimizing the cost function.[4].

(iv) Neural Network

Neural Network is a classification method has been distributed into sub-problems. Various types of NNs have been designed. In Back Propagation Neural Network is used to verify the unique feature in the form of clusters. Neural Networks are accomplished so that a each input leads to a target consequence by maintaining the values of the connections between inputs or objects.

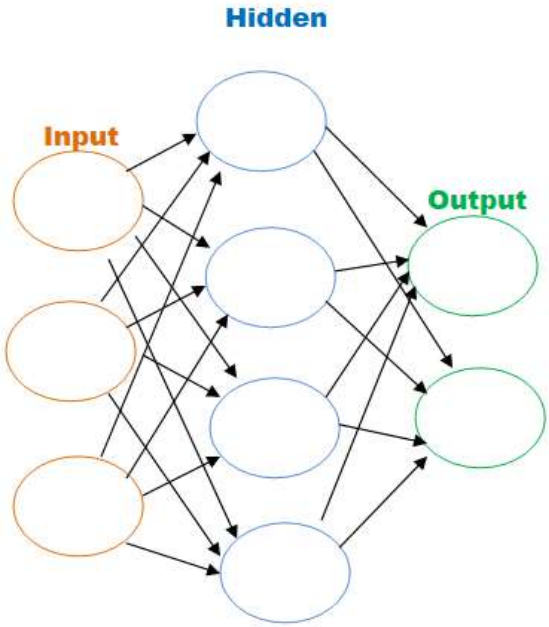

Figure 2.2 Neural Network

(v)Back Propagation Neural Network

Back propagation is a technique used in ANN(artificial neural networks) to factor out a gradient that is needed in the calculation of the weights to be used in the network.[1] It is mostly in use to train deep neural networks,[2] a word invoke to neural networks with more than one hidden layer.[3]

II. MAJOR PROBLEMS IN MOVING OBJECT DETECTION

There are many problems which we face in moving object detection are as follow:

(i) Illumination Issue (ii) Dynamic background (iii) Occlusion (iv) Shadow Presence(v)Motion of the camera (vi) Video Interference

The main problem is occlusion that could define in a real time scenario. In a congested situation, all these occlusions might affect the accuracy of the method. The issue becomes more difficult due to the illumination alters in the scene. Different lighting situation might affect the visibility of an object and even modify the appearance of the object. The way of light are placed in a scene, might cause an object to different look. It isn't easy for one to develop a reliable real time ordinary detection and tracking method i.e., is able to address all these problems. Though, various researchers have employed dissimilar to identify this particular issue, there is still no defining method in terms of accuracy, time and speed.

III. METHODOLOGY

The flow chart summarized the current research work ,divided into different sections and blocks. The methodology of current work mainly include these steps.(i) video upload (ii) frame extraction (iii) pre-processing of video (iv)object detection(v)classification (iv)evaluate parameters. Below is the flow chart of this research work

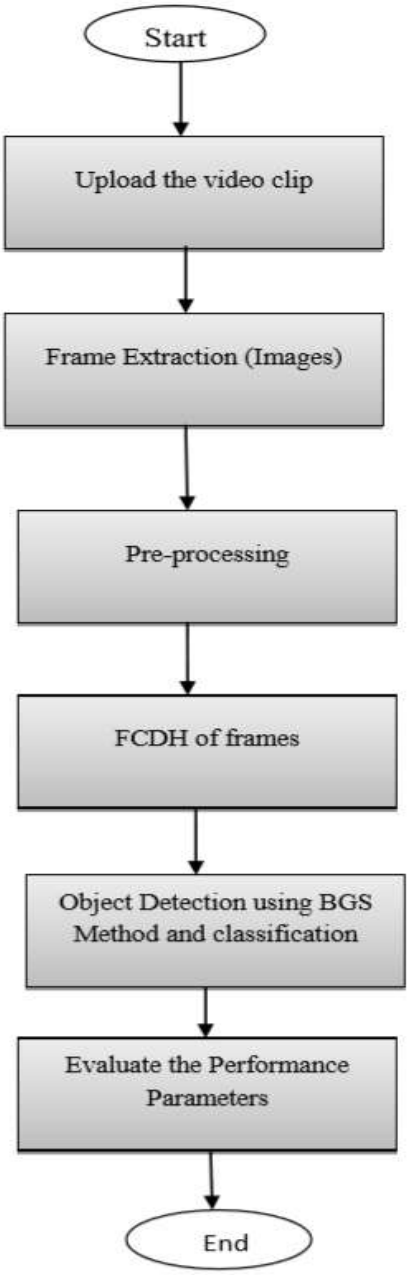

Figure2: flow chart of current research work

Firstly, the video is uploaded from the dataset then the frames are extracted from the video. After that, Back Propagation Neural Network is used in this research and layer wise data processing is done. In this architecture represents a feature process in this neural network. It works in training stage, target, and hidden neurons. It shows that the progress bar in a neural network. In this progress bar measure some parameters like epochs, time, performance, gradient, and mutation and validation checks. The performance parameters like Precision, Accuracy, Error Rate and time complexity.

IV. EXPERIMENTATION RESULTS

In this section, the results of moving object detection are described. Object detection is a challenging tasking real-time visual surveillance system. It acts as a starting phase for further processing like classification, of the detected object etc.

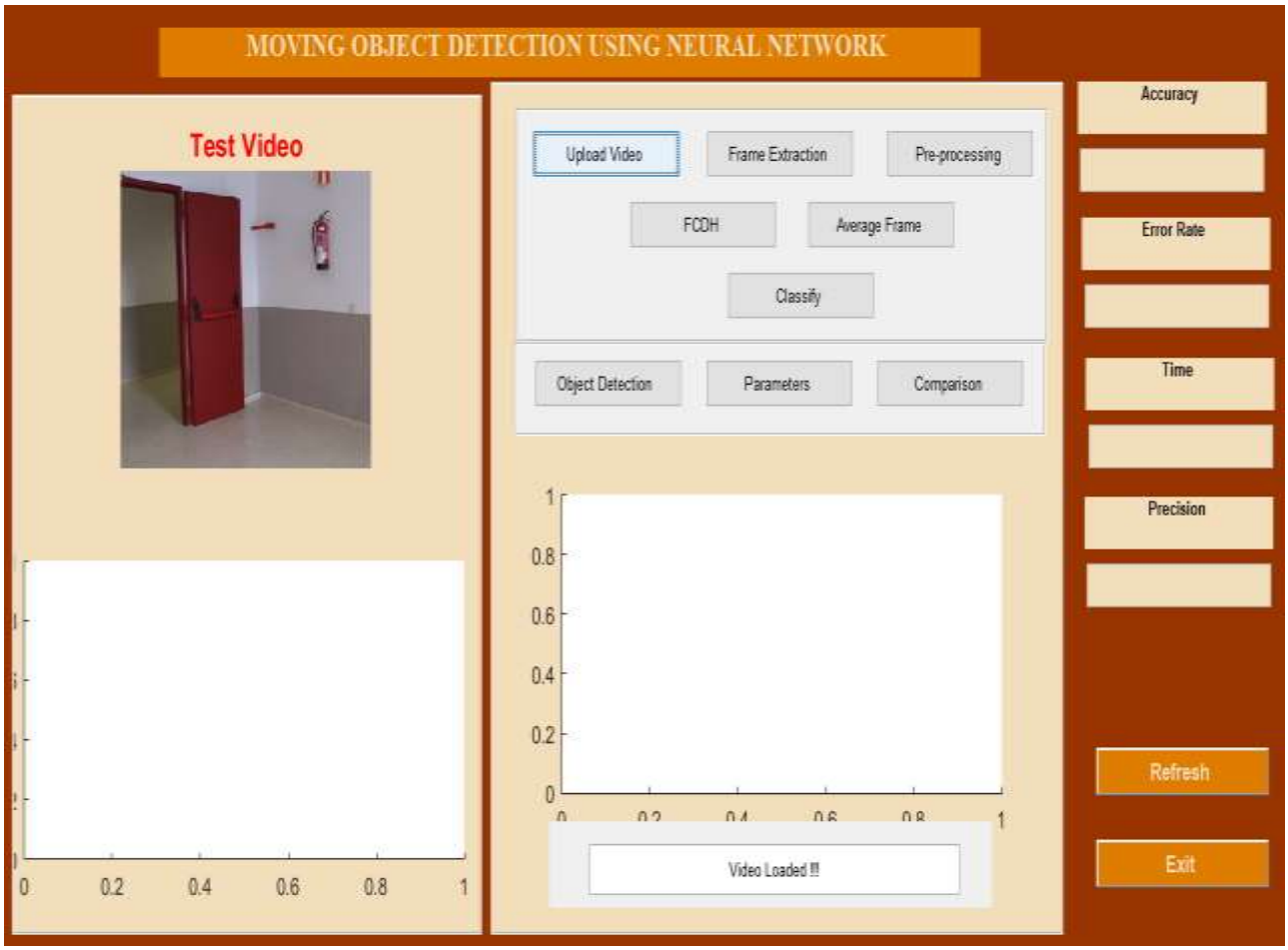

Figure 7 Main Graphical User Interface

TABLE 1 VALUE OF PARAMETERS USING VARIOUS DATASETS

Name Dataset	Input Frame	Accuracy (%)	Time Complexity	Precision	Error Rate
Cloudy Sequence		98	2.5	0.225	0.22524
Simple Sequence		98	4	0.310	0.00067
Camouflage		98	3	0.21	0.0062

Occlusion		98.20	3.2	0.32	0.00625
Cloudy Situations		99.2	3.6	0.36	0.0078
Rainy Situations		98.23	2.0	0.20	0.00621
Camouflage		99	5	0.208	0.00079

5.2 Comparison:

(i) Accuracy rate (%)

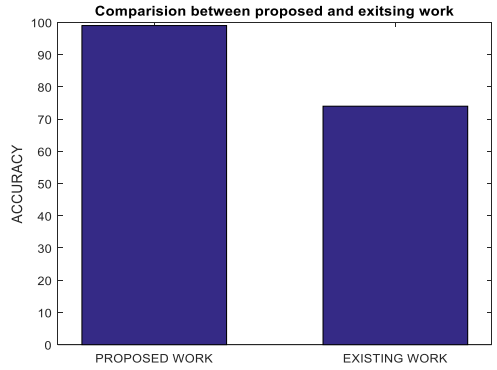

Figure 8.Comparisons
(Accuracy Rate)

(ii) Time Complexity (sec)

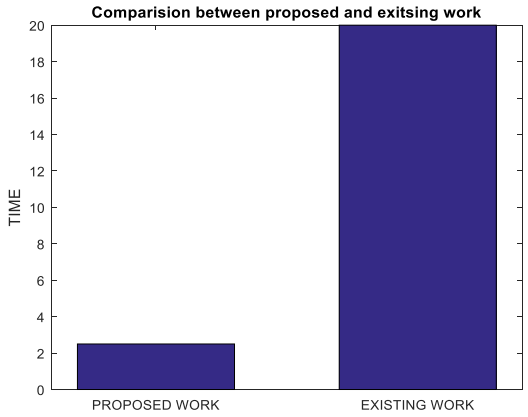

Figure 9.Comparisons
(Time Complexity)

From the above discussion it has been concluded the results using BPNN approach to have enhanced. The performance of the accuracy rate is 98% and time complexity is reduced to a value that is 2.5 sec. FCDH and CDH method has been used to subtract the video frames and evaluate the performance metric to achieve accuracy rate of 74% and Time complexity value as 20 sec.

V.CONCLUSION AND FUTURE SCOPE

In this research, we use new techniques for resolving these problems and try to evaluate various parameters for the performance like accuracy, false acceptance rate, time consumption and error base. In back propagation neural network proposed method evaluates the accuracy rate and existing accuracy with FCDH. Future work can conclude: Although the

visual tracking algorithm proposed here is robust in many of the conditions, it can be made more robust by eliminating some of the limitations as: In the Single Visual tracking, the size of the template remains fixed for tracking. If the size of the object reduces the time, the background becomes more dominant than the object being tracked and if the object may not be tracked. A fully occluded object cannot be tracked and considered as a new object in the next frame.

REFERENCES

[1] Dhar, Pranab Kumar, Mohammad Ibrahim Khan, Ashoke Kumar Sen Gupta, D. M. H. Hasan, and Jong-Myon Kim. "An efficient real time moving object detection method for video surveillance system" *, International journal of Signal processing, Image processing and Pattern Recognition 5*, vol 3 ,pp.93-110,2012.

[2] Joshi, Kinjal A., and Darshak G. Thakore. "A survey on moving object detection and tracking in video surveillance system". *International Journal of Soft Computing and Engineering 2*, vol 3 pp. 44-48,2012.

[3] Kim, Kyungnam, Thanarat H. Chalidabhongse, David Harwood, and Larry Davis. "Background modeling and subtraction by codebook construction." In Image Processing, 2004. ICIP'04. *2004 International Conference on*, vol. 5, pp. 3061-3064. IEEE, 2004.

[4] El Baf, Fida, Thierry Bouwmans, and Bertrand Vachon. "A fuzzy approach for background subtraction". In Image Processing, 2008. ICIP 2008. *15th IEEE International Conference on*, pp. 2648-2651. IEEE, 2008.

[5] Mohan, Anaswara S., and R. Resmi. "Video image processing for moving object detection and segmentation using background subtraction". In Computational Systems and Commotions (ICCSC), *2014 First International Conference on*, p.288-292. IEEE, 2014.

[6] Jadhav, Ms Jyoti J., and J. Jyoti. "Moving Object Detection and Tracking for Video Survelliance." *International Journal of Engineering Research and General Science 2*, *vol 4*,pp. 372-378,2014.

[7] Fablet, Ronan, P. Bouyhemy, and Marc Gelgon. "Moving object detection in color image sequences using region-level graph labeling." In Image Processing, 1999. ICIP 99. Proceedings. *1999 International Conference on, vol. 2*, pp. 939-943. IEEE, 1999.

[8] Nazgul Dastanova, Sultan Duisenbay, Olga Krestinskaya, Alex Pappachen James, "Bit-Plane Extracted Moving-Object Detection Using Memristive Crossbar-CAM Arrays for Edge Computing Image Devices", *Access IEEE*, vol. 6, pp. 18954-18966, 2018.

[9] Yong Luo, Ye Peng Guan, "Motion objects segmentation based on structural similarity background modelling", *Computer Vision IET*, vol. 9, no. 4, pp. 476-488, 2015.

[10] Lili Huang, "Real-time multi-vehicle detection and sub-feature based tracking for traffic surveillance systems", *Informatics in Control Automation and Robotics (CAR) 2010 2nd International Asia Conference on*, vol. 2, pp. 324-328, 2010.

[11] Jiang, F., Hao, Z., & Liu, X., "Deep Scene Text Detection with Connected Component Proposals", *arXiv preprint arXiv: 1708.05133, vol.7, no.4 pp.122-125,2017*.

[12] Choudhury, S. K., Sa, P. K., Padhy, R. P., Sharma, S., &Bakshi, S., " Improved pedestrian detection using motion segmentation and silhouette orientation", *Multimedia Tools and Applications*, vol.3 , no 5, pp.1-40,2017.

[13] Fernandez-Sanchez, E. J., Diaz, J., &Ros, E., "Background subtraction based on color and depth using active sensors", *Sensors*, vol.*13, no.*7,pp. 8895-8915, 2013.

[14] Ratnayake, K., &Amer, A., " Embedded architecture for noise-adaptive video object detection using parameter-compressed background modeling",*Journal of Real-Time Image Processing*,vol.*3*, no. 2,pp. 397-414,2017.