Literature Survey of Iot Capabled Crowd Analysis Using Raspberry Pi-3

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Abstract *– This paper describes analysis of crowd activities using surveillance videos is an important issue for communal security. This project also allows detection of dangerous crowd where they are headed. In our study, we develop a system using Raspberry Pi 3 board that consists of ARMv8 CPU that detects the human heads and provide a count of humans in the region using Open CV-Python. Human tracking is achieved by indicating the direction of movement of the person. The different stages for computer based crowd analysis algorithm are people counting, people tracking and crowd behavior analysis . This project is made for security purpose where there is possibility of dangerous crowd for example mall , railway station ,shopping center.*

In our method we are uses sensors to detect the level of oxygen . In this method not only detect the direction of crowd but also detect crowd is dangerous or not. *In this way we* could have been prevented, many deaths and injuries.

Keywords- *Video Surveillance, Crowd Density, Abnormal Crowd Detection, Crowd Tracking*

1. INTRODUCTION

Nowadays, one of the most interesting and active research topic in computer vision is the analysis of crowd behavior. Crowd is a group of people gathered in a certain location. Crowd differs in different situation, for eg., crowd in a temple will be different from the crowd in a shopping area. Crowd is a group of individuals sharing a common physical location. Now a days increase in human population tends to increase the crowd in public areas. Thus it is required to analyze the crowd behavior in the crowded environment. Video surveillance is one of the methods to analyze the crowd behavior in crowded scene. For the crowd analysis the important processes involved are the crowd behavior, crowd tracking, crowd density estimation, and crowd motion detection as shown in figure 1.
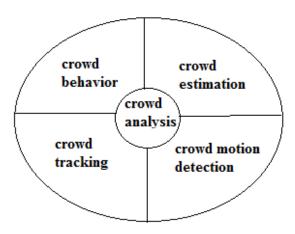

figure 1. Crowd Analysis

2. LITERATURE SURVEY

The general technique for moving object detection is background elimination under the situation of fixed cameras. Videos of crowd scenes present challenging problems in computer vision. Now days managing the crowd properly is very important. . If the crowd is not managed/controlled properly, it affects the safety of the people in the crowded area. Hence to control the crowd, security measures will be taken in certain situations where abnormal behavior of crowd is expected. For example, during election, celebration of festival, mob, etc,.. But sometimes human eye cannot predict when and where the situation goes out of control. Hence, a

Impact Factor Value 4.046   **e-ISSN: 2456-3463**

International Journal of Innovations in Engineering and Science, Vol 4, No.10,2019
National Level Technical Paper Presentation- PHOENIX-19
Organized by Godavari College of Engineering, Jalgaon - 425003
www.ijies.net

surveillance system with several closed circuit Television (CCTV) is used to monitor the crowd. The human eye cannot observe all the cameras simultaneously. Thus an automated technique must be used for continuously monitoring the crowd for a long period. Challenging problems in detecting the desired events automatically are that, simultaneous occurrence of more than one events, large number of data must be processed, occlusions and real time detection. The proposed method can be applied from small group of object. In this paper present new representations of human group motion for static cameras, and propose algorithms for their application to variety of problem [1]. In 2011 paper describe first propose a novel method to model and learn the scene activity of a crowd using Social Force Model for the first time in the computer vision community. This present a method to densely estimate the interaction forces between people in a crowd, observed by a static camera. The patterns of activities of the objects in the scene are modeled in the form of volumes of interaction forces and also used Latent Dirichlet Allocation (LDA) to learn the model of the normal activities over extended periods of time. Analysis of a crowd behavior using surveillance videos is an important issue for public security, as it allows detection of dangerous crowds and where they are headed. Computer vision based crowd analysis algorithms can be divided into three groups; people counting, people tracking and crowd behavior analysis [2]. In the literature [3] optical flows are firs estimated and then used for a clue to cluster human crowd into groups in unsupervised manner using our proposed method adjacency matrix based clustering(AMC). In this paper clusters of human crowds are obtained, their behaviours with attributes, orientation, position and crowd size, are characterized by a model of force field. In 2018 Journal of visual languages and computing presented new framework in the crowd behaviors analysis and trajectory detection in unstructured scenes. In this journal the FCM(fuzzy c-means) algorithm is adopted to cluster the source points and sink points of trajectories that are deemed as critical points into several groups, and then the trajectory cluster can be acquired [4]. Video surveillance faces number of challenges. One among those is the detection of abnormal behavior. Hence Antonakki et.al. [5] proposed a bottom up approach to classify normal and abnormal behavior using different criteria.

2.1 Problem statement

The previously used system consist of only crowd analysis ,tracking and detection, but in our system we are obtaining people counting, tracking and motion detect. It also detects number of people gathered in which direction according camera. We are also detect whether crowd is dangerous or not e.g. Gun like things. We are using DNN.

3. PROPOSED METHODOLOTY

In our method Deep learning is the most interesting and powerful machine learning technique right now. This Deep learning models are being used for very difficult problems and making progress, like colorizing image and videos based on the context in the scene. It is used for trained the particular object.

Our method is divided in four modules:

- Background/Foreground Modeling,
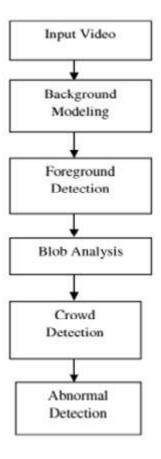- Blob Analysis,
- Crowd Detection and
- Abnormal Crowd Tracking .

Fig. 2. Proposed algorithm

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In our method using webcam for captured input video. In this method we are using Background/Foreground detection acting a very significant role in a video content analysis system. This Background subtraction is the method used to fragment the object in a frame. In our method using static camera, hence when static cameras are used, a popular approach is background subtraction. Blob Analysis is based on testing of trustworthy image region.

Raspberry pi 3 For hardware implementation, we use Raspberry Pi board. Raspberry pi 3 has a 1.2GHz 64-bit quad-core ARMv8 CPU, 802.11n Wireless LAN, Bluetooth 4.1 and Bluetooth Low Energy (BLE) and it also has a 1GB RAM, 4 USB ports, 40 GPIO pins, Full HDMI port, Ethernet port, Camera interface, Display interface and a Micro SD card slot.

Software-; The software used in this method is OpenCV-Python. Python is an easy to learn language **.**Python language is an interpreted high programming language for general -purpose programming. **.** This python is Created by Guido van Rossum and first released in 1991, Python has a design philosophy that emphasizes code readability, notably using significant whitespace. Feature of python is a dynamic type system and automatic memory management, imperative, functional and procedural and it also has a large and comprehensive standard library. Python interpreters are available for many operating systems.

4. CONCLUSION

In this paper presents the literature survey an analysis of crowd. Video surveillance is one of the most effective methods for crowd analysis. In this paper we have discussed the different methods used for detecting abnormal crowd behavior viz., crowd density estimation, tracking, motion detection and behavior recognition. For the more safety we are we are detect not only the crowd behavior but also detect the weapons for eg. Gun like things. It also announced on which side the weapon is present. Although We are using DNN. In our method Deep learning is the most interesting and powerful machine learning technique right now.

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