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Crowd Density Estimation Using Base Line Filtering

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Abstract: **Tracking and detecting the crowd is the main problem in the current era hence we are making video scenes method .Detection of many individual objects has been improved over recent years .It has been challenging to detect and track the tasks due to occlusions and variation in people appearance. Facing these challenges, we suggest to leverage information on the global structure of the scenes and to resolve jointly. We explore the constraints of the crowd density and detection of optimization using joint energy function. We show how the optimization of such energy function improves to track and detect in floating crowds. We validate our approach on a challenging video dataset of crowded scenes. The addition of different features which is relevant to tracking peoples such as movement, size, height and the observation models in the particle filters and followed by a clustering methods. It minimizes the communication cost and Data Retrieval is easy.**

Keywords: **Crowd Density Estimation, Making Video Scenes Method, Base Line Filtering.**

1. INTRODUCTION

Crowd monitoring is very important in many aspects especially in the areas of Airports, railway stations, sports, and rallies. Excessive crowding will result in unexpected events, such as riots, fights or emergencies. Crowd density can serve as an important descriptor of crowd stability because it can quantitatively or qualitatively provide the amount of pedestrians in an area. There have been many methods for crowd density estimation using computer vision techniques. These methods can be divided into three categories,

1) Pixel-based analysis,
2) Detection-based analysis, and
3) Texture-based analysis. These methods rely on specific camera training data which requires a system to be trained and tested on the same viewpoint, using potentially hundreds or thousands of annotated training frames. Even though large-scale CCTV networks are becoming increasingly common, automated crowd counting is not widely deployed.

Video analysis techniques are becoming increasingly popular in the visual surveillance of public areas because of their great efficiency in gathering information and low cost in human resource. A central topic is the automatic analysis and detection of abnormal events. One particular abnormal event is crowding which may occur wherever a large number of people gather together at public assemblies, sport competitions, or demonstrations (e.g., strikes, protests), etc. Because of the high level of risk, crowding has always been of high concern to relevant authorities. In recent years, a number of security agencies specialized in crowd management have emerged, and the visual surveillance research has studied the automated monitoring crowd movements.

II. RELATED WORKS

In this paper [1] they proposed a people detection using component based. In This technique we demonstrate a system that locates people in cluster scenes. In accurately detects the component of a person's in the image like head, left arm and right arm and legs instead of full body. It checks weather it is in proper geometric configuration. By calculating the geometric constraints for each component from a sample of the training images,by taking means of the centroid and top and bottom boundary edges. There are two sets of constraints for the arms, one is intended for extended arms and the

other is for bent arms. Haar wavelet functions are used to represent the images and Support Vector Machines (SVM) .some component-based detectors are combined at the next level by another SVM. This system performs better than a similar full-body person detector. This makes that to the improvement in performance is due to the component based approach. The main drawback of this method is more time consuming.

In this paper [2] they proposed a DDMCMC approach. This model is used to approach to interpret the image observation by human hypotheses in a Bayesian framework. This approach to segmenting and tracking multiple humans emphasizes the use of shape models.

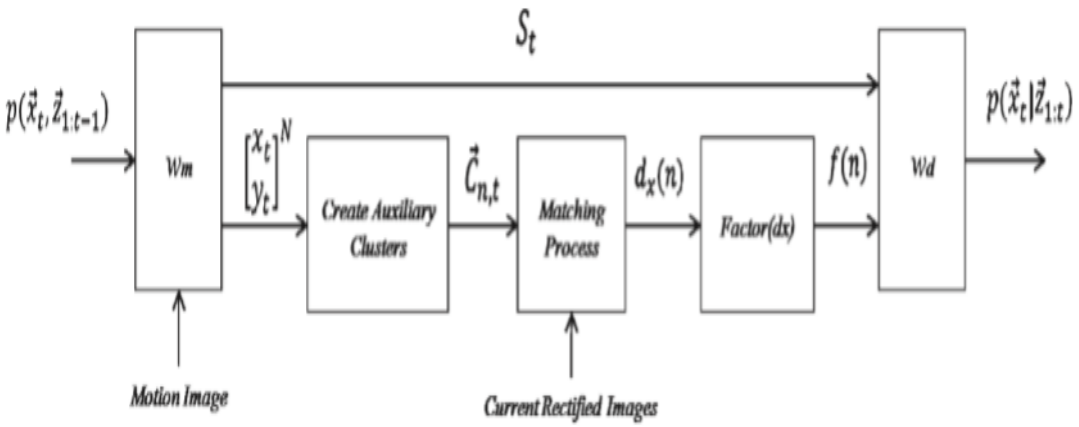
Based on a background model, the foreground blobs are extracted as the basic observation. By using the camera model we can detect the object move on a known plane, multiple 3D human hypotheses are projected onto the image plane. Hence the hypotheses are in 3D, occlusion reasoning is straightforward. In a single frame, we segment the foreground objects into multiple humans and associate the segmented humans with the existing trajectories. Then, the tracks are used to identify the human hypotheses in the next frame. The segmentation and tracking are integrated in a unified framework and interoperate along time.

In this paper [3] we develop a Neural Network .This is EM based people counting method to detect the individual in low resolution image. After getting the background image, a foreground is obtained .The different between the background and current image. The threshold is set in such a way that people moving slightly show some scattered pixels by keeping the noise low. Our threshold evaluation value is 40.If the intensity difference of a pixel is between the current image and the background image is larger than 40, then it is viewed as a foreground pixel. This perspective correction is an important step for foreground estimation. The objects of different location are brought the same scale. This is obtained by the foreground pixel image after closing the operation.Before clustering feature points to each individual person and a cluster model needs to be established.

In this paper [4] the individual tracking is considered as single target. Different targetsis updated in the sampling time and hence we propose the use of a multimodal estimator. Our system contain extended particle filter is based on the extended condensation algorithm for the multimodal estimator. Particle filter cause Degeneration problem and thus it reduce it effect, resampling step is included. The Final reinitilazation stage is incorporated in order to perform tracking and to be able to add new hypotheses to the priori PDF.

1) **Initialization:** The particles are distributed through the counting area with the help of independent identical distribution (i.d). All the particle weights $w^{\sim(i)}$ are initialized at the same value.

2) **Propagation:** At the subsequent time each particle is set to be propagated using the state or updating model.



Observation stage in the extended particle filter with random re-initialization:

The weight associated with each particle is maintained equal to its weight prior to predicting its state vector.

1) Selection: The selection process includes a uniform random multinomial resampling of the discrete belief, which provide the correction stage. Normalization of all particles is important. In this way, more of the particles with greater weight are regenerated than particles presenting a lower weight.

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III. IMPLEMENTATION PART

To start with, the foreground is extracted firstly by background removal using a reference image, then crowd density is computed as a function of the number of foreground pixels; the function itself is obtained by curve fitting. The foreground of moving crowds is detected by a Bayes decision rule [frames] for classification between background and foreground. The total number of people in a crowd is estimated by analyzing the sizes and positions of detected heads [feature set]. The method may fail if the observed area is so crowded that few heads can be detected. The degree of crowding is estimated in monocular image sequences. And future crowd densities and velocities can be predicted using the information obtained from a number of cameras.

CROWD EXPLAINATION:

1. IMAGE RECTIFICATION:

The projective geometry intrinsic has the two different types of views and hence internal parameters have been installed on the cameras for relative working position. The geometry term where used to obtain 3-D positions for the space in the camera applications. The main advantages of this type of configuration searches the correspondence point of the image plane, in order to search the configuration on a single line. Therefore for getting the same perspective space from both cameras we should rectify the concern images by stereo type of the system. The intrinsic and extrinsic dataset has been obtained in stereo during offline.

2. LOW LEVEL PROCESSING:

Low level of processing information is carried out different type of information in the subsequent changes. The two important methods for low level processing are Motion Detection and People Candidate Height.

1) Motion Detection:

Camera 1 used to detect human motions however the images which is detected are somewhat irrelevant to images captured in camera1 and camera 2. Hence the motion detection has been carried out in images on both the area by providing redundant process of the image. By dividing the consecutive images the position for the image has been obtained. Image differencing technique used for extracting the movement of background with low computational cost of performance with the image detection, motion detection requires the current and previous images rapidly should be changed for the background subtraction method hence where the changed images have the very impact factor.

2) People Candidate Height:

Algorithms obtained by the height of public are generated by using auxiliary clusters with different type of iterations. Thus, edge detection as been followed by the interest of stereo matches but motion detection is not directly related to the iterations intensity for the later recognition. Stereo corresponds method is based on the two categories 1.Technique which is based on the intensity values 2.Technique which is based on the characteristics extraction from corners, and edges. Canny edge detector used to represent the best and effective performance in addition to the obtaining edges with smooth outlines. Images edges were not compared with whole image detection therefore it is necessary to obtain stereo correspondences. Correspondences method is calculated using the correlation matching execution.

IV. SCREEN SHOTS

a. Input Image after segmentation from Video into frames:

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Once the video has been captured with the high range of intensity camera applications, then the video has been segmented into different types of frames for the head counts.

b. Image Preprocessing results :

Head detection results after Morphological operations

Image processing is any form of signal processing for which the input is an image, such as photograph or video frame; the output of image processing may be either an image or a set of characteristics or parameters related to the image. Most image-processing techniques involve treating the image as a two-dimensional signal and applying standard signal-processing techniques to it.

c. Tracking People with CVrect function :

Tracking peoples based on the head counts with help of background removal and foreground extraction.

d. Actual count per frame in a video :

In this video we can able to see the head count .In the floating crowd using the technique of background removal and foreground extraction the peoples are separated and heads are counted .This is done by segmenting the image from the video .The no of frames is calculated by the intensity of the lence.

V. CONCLUSION

In this phase, we have presented a new proposal for bidirectional counting based on images from a stereoscopic overhead view camera system. The extended particle filter with random reinitialization provides the probabilistic and multimode characteristics required to carry out multiple-hypothesis tracking. The modified K-means clustering method is incorporated in order to provide deterministic output. Stereo vision is a key element for differentiating between people and other objects that may appear in the count. A minimum degree of movement is required for human motion to be considered detectable motion. Several types of movements, such as stop-and-go, are processed satisfactorily. The main contribution of this paper is the inclusion of different features relevant to people tracking (movement, size, and height), adapting a particle filter followed by the implementation of a clustering method, by providing zero failure to the algorithm. The reinitialization stage of the proposal is capable of incorporating new hypothesis beliefs. This stage provides a constant execution time regardless of the number of hypotheses. The proposed algorithm presents problems of particle set deterioration when many people (more than four people) interact, crossing the counting area at the same time.

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