A.N. Thakare, 2022, 10:2
ISSN (Online): 2348-4098
ISSN (Print): 2395-4752

To Develop a New Method for Crowd Size Estimation in Real Time Application

Dr. A.N. Thakare, Harshada Yenurkar, Sakshi Yenurkar, Sunny Taksande, Shrirang Chaware, Harshika Yelane, Dipali Wankhede
Department of Computer Engineering,
Bapurao Deshmukh College of Engineering,
Sewagram, Wardha

Abstract- The growing number of people in the crowd scene may increase the probability of security threat, which make crowd size estimation more important. In this digital Era, physical counting of people in crowd is very old fashioned and time consuming method. These methods fail in places where the movement of crowd is random. We are developing this propose system for situation where emergency evacuations are required. Most of the existing approaches could not estimate crowd in real time. This paper introduces new method for crowd size Estimation in real time application to improve accuracy of crowd. Most of the available methods could not measure the crowd in real time. This paper introduces a new way to measure crowd size in real-time application to improve crowd accuracy. The system uses a processor to exploit. Compatible computer framework for accomplishing fast processing of video- captured video feeds. This function helps to create a model to find the head captured by the camera. This system provides additional accuracy in estimating the total population.

Keywords- Parallel computing, estimating the head count.

I. INTRODUCTION

Real-time human detection and tracking from monitored videos is one of the most effective research areas for computer vision and pattern detection. This is because of the widespread use of the app. One such system is the census, or population measure, in which the two most important components are human detection and tracking. Traditional methods such as the use of sensors are not appropriate as they can be easily integrated with current video surveillance programs.

With video surveillance systems becoming more common in many places, using vision-based census techniques would be a sensible approach.

The discovery of a person is the task of finding all the conditions of the people in the image, and it has been accomplished extensively by searching all the places in the image, on all possible scales, and comparing a small area in each place with known symbols or patterns of people.

Accurate identification in the visual testing program is important in a variety of application areas including the detection of abnormal events, visibility of movement, congestion analysis, identity identification, gender segregation and the detection of adult falls.

There are limitations within the human capability to observe synchronous events in police investigation displays [1]. Hence, human motion analysis in machine-controlled video police investigation has become one in all the foremost active and enticing analysis topics within the space of laptop vision and pattern recognition.

AN intelligent system detects and captures motion data of moving targets for correct object classification. The classified object is being caterpillar-tracked for high-level analysis.

During this study, we tend to concentrate on police investigation humans and don't contemplate recognition of their complicated activities.

Human detection may be a troublesome task from a machine vision perspective because it is influenced by a large vary of attainable look thanks to dynamic articulated cause, clothing, lighting and background, however previous data on these limitations will improve performance.

II. BACKGROUND STUDY

In recent years computerized computer-assisted interaction has become increasingly common. Over the past few decades, automated video analytics has become a potential research tool for computer perspective due to the abundance of your applications in intelligent video-based programs.

There are three key stages of video sequencing analysis: detection of moving key elements, tracking of these key elements by frame, and analysis of object tracks to predict the activity or behavior of these objects. In addition, the surveillance system plays a key role in preventing crime and the threat of terrorism in the public and private sectors.

It depends on the ability to see things moving in and out scenes are considered an effective step in extracting information from computer vision systems. The word 'object' usually refers to its normal state, which includes pedestrians and man-made objects (e.g., cars, ships, buildings, etc.), with sharp and independent boundaries in the background.

However, the acquisition of a moving / front object has been a challenging task for the following reason, that is, many moving objects may occur at the scene; small and poorly adjusted moving parts; a sharp and rapid change in lighting conditions and shadows and the many closures that exist.

Over the decades, great strides have been made in developing various forms of acquisition of different types of moving objects that reflect cars and pedestrians in the interior or exterior. Although there are many alternatives, in-depth reviews and experimental literature reviews on the acquisition of standardized items are still lacking.

Depending on the situation, our proposed system predicts sign language for sign language. This survey will be particularly useful for researchers in order to have a better understanding of object detection algorithm and image processing.

Computer vision research aims to understand the representation and processes of basic concept with enough detail to be used in a computer.

There are two main reasons for this:

- Developing a computer vision system as a means of testing and evaluating human vision or bio-logic system models and 2) using engineering methods to design and build computer systems to solve real problems.
- The main purpose of computer vision is to create models and quotes for data and information from images, while image processing is about initiating computer conversion images such as sharpening, contrasting, among others.

III. LITERATURE SURVEY

V. X. Gong. [1] Proposed a system for crowd counting analysis using social media images in city events. Instagram is use for collecting images to construct the social media dataset. Instagram pictures square measure collected through the API of Instagram platforms victimization Social Glass.

Findings show that direct methods reach better estimation accuracy than indirect methods. Specifically, Darknet Yolo reaches the very best accuracy in crowd size level estimation (72.01%) and in estimating the particular range of individuals once but twenty is (38.09 %).

Ujwala Bhangale [2] proposed a system to develop a situation where emergency evacuations are needed like fireplace outbreaks, black events, etc. and creating familiar choices on the idea of range of individuals like food, water, police work congestion, etc. the particular count might not be utterly correct thanks to human error.

Saleh Basalamah, swayer Daud Khan, and Habib Ullah [3] we have a tendency to propose a scale driven convolutional neural network (SD-CNN) model, that is predicated on the idea that heads are the dominant and visual options no matter the density of crowds. To touch upon the matter of various scales of heads in several regions of the videos, we have a tendency to annotate a group of heads in random locations of the videos to develop a scale map representing the mapping of head sizes right hand.

Oquab et al. minimize the parameter of the network with random gradient descent (SGD) with momentum of zero.9 and weight decay zero.0005.

Mayur D. Chaudhari1 and Archana S. Ghotkar [4] purposed of crowd density analysis is to calculate the concentration of the gang within the videos of observers. Convolutional Neural Network primarily based strategies include deep learning approaches for crowd detection and density analysis.

Detection primarily based approach winning within the low-density crowd and affected within the high-density crowd. Detection primarily based approach winning during a density crowd and littered with a high-density crowd.

Zahraa Salah Dhaief. [5] Proposed a method which may mix some existing technologies to overcome some problems. The folks counter needs additional powerful process since it deals with period video, that the planned methodology converts a color image into binary so as to reduce information of image.

The Object Detection (Blob Detection or The Virtual Gate algorithmic rule relies on the changed Optical Flow methodology. the tactic developed for reckoning folks doesn't involve classifying modules as a result of the aim of the algorithmic rule is to notice size and direction of motion of objects in video sequences Blob analysis) is a process that is used in the proposed method to analysis an image for detecting foreground objects.

It may a difficult process in some cases such as when the object is same color as the background, the object may contain holes. Object is detected by finding all adjacent pixels and collects them to form the object. Blob object is hard to analyze when it composes of multiple people. This case may occur in crowded areas.

K. Kopaczewski & M. Szczodrak & A. Czyzewski & H. Krawczyk [6] aim of the work is to estimate the quantity of individuals passing through entrances of an oversized sport hall. The foremost difficult downside was the unannounced behavior of individuals whereas getting into the building. The examined flow of individuals fluctuated between individual persons and dense crowd. Visual Studio a pair of010 edition and OpenCV 2.4. OpenCV offers an awfully economical tool for face detection the common accuracy was eighty three, 74%.

The errors occurred principally by count folks a pair of times by results of the person's movement and distorted head (not frontal face). If the camera captures the frontal faces, the accuracy will be augmented.

Hou, YL; Pang, GKH [10] aims to develop an effective technique for estimating the quantity of individuals in a very difficult. A neural network is employed to estimate the quantity of individuals in real time. Somebody's detection technique supported the EM rule has been tried for ensuant video process. By agglomeration the KLT feature points in a very foreground mask, the need for associate degree correct foreground contour has been reduced.

The most effective estimation results, with a tenth average error, were achieved once each foreground pixels and closed foreground pixels are learned in a very having dimensions just like the scale of a mean form. The obtained accuracy tally of highest achieved worth is ninety nine.7 try to the bottom is ninety three 1 %.

Cong Zhang [8] proposes a deep convolutional neural network (CNN) for crowd counting, and it's trained instead with 2 connected learning objectives, crowd density and crowd count. the gang CNN model is pre-trained supported all coaching scene information through our projected switchable learning method. The gang CNN model is pre-trained supported all coaching scene information through our projected switchable learning method.

H.Hakan Cetinkayaa and Muammer Akcayb [9]. Proposed people counting system based on face detection automatically detecting a human face from the video was built by using Microsoft neural network

Liqing Gao [11] proposed a quadratic programming model with the network flow constraints to enhance the accuracy of crowd count. The Fudan dataset is employed by Tan [29] and contains 5 sequences of three hundred frames every, 1500 frames in total. It's price nothing that the ground-truths of all datasets area unit generated by manually count folks within the mere regions in every sampled frame.

IV. METHODOLOGY

There is a crucial distinction between object detection and object chase that you simply should perceive before continuing with the whole study. We have a tendency to once us after us} use object detection we confirm wherever the image / frame of Associate in Nursing object is. Object finder is typically costlier to calculate, therefore it goes slower, than Associate in Nursing object chase rule. Samples of object detection algorithms embrace Haar cascades, HOG + Linear SVM, and deep learning-based object detectors like quicker R-CNNs, YOLO, and Single hearth Detector (SSDs).

1. Video streaming:
For object detection, we tend to work with a digital camera and calculate the frames per second (FPS) output rate. The first two hurdles to consider when working on this issue are efficiency with FPS and accuracy.

2. Pre-processing:
Frames are often pre-processed by resizing and changing to rgb. OpenCV may be a library for playing easy laptop vision and image process tasks. Deep neural network assessment, gap and writing video files and displaying the output frame on our screen square measure all through with OpenCV.

3. Object identification:
It is a laptop technique that identifies linguistics objects happiness to a selected category in pictures and videos and creates border boxes around those objects. It deals with laptop vision and image process.

4. Object tracking:
We will use the center of mass chase rule for this. the middle is calculated victimization the border box. the gap between the new and existing centroids is decided victimization parabolic geometry. It conjointly unregisters things that are aloof from the sphere.

Phase 1 - Finding: During the acquisition phase we use the most expensive tracker to (1) verify if new things have entered our read, and (2) to ascertain if we are able to notice "lost" things throughout chase. Section for every no inheritable item we tend to produce or update Associate in nursing item hunter with links to a replacement compound box. As our laptop instrumentality is incredibly high- priced we tend to use this section once each N frame.

Phase 2 - Tracking: If we have a tendency to be within the "find" section we have a tendency to ar within the "tracking" section. With every of our found objects, we have a tendency to produce Associate in Nursing object hunter to trace the thing because it rotates the frame. Our object hunter ought to be quicker and a lot of economical than the thing detector. We are going to still track till we have a tendency to reach the N-frame and restart our object finder. The complete method may be a repetition. Data Received Camera is processed with the Open CV Algorithm which is the fastest acquisition algorithm to date, which is very effective in improving speed and FPS across the level of opponents using multi- object chase unfold across all processes / cores. So as to create our folks investigating applications, we are going to want a range of Python libraries.

We plan to improve image accuracy to avoid rushing into public places. We will count people based on the findings and behavior of people visiting public places airport, shopping center, museum, etc to track to check the top camera. We collect data by calculating the number of people entering and leaving these spaces and measuring their actions, sizes, and movements.

V. CONCLUSION

In this work, we have trying to propose a methodology for automatic evaluation of people counting methods. Our evaluation methodology was made possible by automatically counting the true position of human by using Open CV. By using this method, we can achieve more accurate result.

We find in the previous papers that the accuracy of the counting people is less when number of people increased in an image. Thus, we create a sustained system to achieve more accuracy than previous research.

REFERENCES

[1] V. X. Gong W. Daamen1 A. Bozzon S. P. Hoogendoorn "Counting people in the crowd using social media images for crowd management in city events" Faculty of Civil

Engineering and Geosciences, Delft University of Technology, Stevinweg 1, 2628 CN Delft, The Netherlands 12 january 2021.

[2] X., Xiao, Z., Zhang, B., Zhen, X., Cao, X., Doermann, D., Shao, L.: Crowd counting and density estimation by trellis encoder– decoder networks. In: Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, pp. 6133–6142 (2019).

[3] Salzmann, M., Fua, P.: Context-aware crowd counting. In: Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, pp. 5099–5108 (2019).

[4] Bonnetain, L., Cats, O., van Lint, H.: Constructing spatiotemporal load profiles of transit vehicles with multiple data sources. Transp. Res. Rec. p 0361198118781166 (2018).

[5] Zhang, X., Chen, D.: Csrnet: dilated convolutional neural networks for understanding the highly congested scenes. In: Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, pp. 1091–1100 (2018).

[6] Nanni, L., Ghidoni, S., Brahnam, S.: Handcrafted vs. non-handcrafted features for computer vision classification. Pattern Recognit. 71, 158–172 (2017).

[7] V. A. Sindagi and V. M. Patel, ''HA- CCN: Hierarchical attentionbased crowd counting network,'' IEEE Trans. Image Process., vol. 29, pp. 323–335, (2020).

[8] W. Ge and R. T. Collins, ''Marked point processes for crowd counting,'' in Proc. CVPR, pp. 2913–2920,9 jun(2016).

[9] Lingbo Liu, Zhilin Qiu, Guanbin Li, Shufan Liu, Wanli Ouyang and Liang Lin, "Crowd Counting with Deep Structured Scale Integration Network", IEEE, (2019).

[10] Diping Song, Yu Qiao and Alessandro Corbetta, "Depth Driven People Counting Using Deep Region Proposal Network", Proceedings of the 2017 IEEE International Conference on Information and Automation (ICIA) Macau SAR, China, July (2017).

[11] D. M. Gavrila. Pedestrian detection from a moving vehicle. In Proc. European Conference on Computer Vision (ECCV), 2:37–49, (2018).

[12] D. Kong, D. Gray, and H. Tao. A viewpoint invariant approach for crowd counting. In Proc. IEEE International Conference on Pattern Recognition (ICPR), 3:1187– 1190,(2017).

[13] D. G. Lowe. Distinctive image features from scale-invariant key points. International Journal of Computer Vision (IJCV), 60(2):91–110, (2016).

[14] Zhou and Qian He, "Cascaded Multi-Task Learning of Head Segmentation and Density Regression for RGBD Crowd Counting", Digital Object Identifier 10.1109/ACCESS.2020.2998678, June 10, (2020).