International Journal of Recent Engineering Research and Development (IJRERD)
Volume No. 02 – Issue No. 04, ISSN: 2455-8761
www.ijrerd.com, PP. 56-59

Abandoned Object Detection using Image Processing

Dhanashri Adalinge, Damini Patil, Shubhada Dongare, Surabhi Gokodikar, Prof. M. K. Kodmelwar

Department of Computer Engineering, TSSM's Bhivarabai Sawant College Of Engineering & Research, Pune.

Abstract: A method for detecting abandoned object in relatively crowded areas. The detection process is carried out using blob detection, and foreground and background isolation. The system when implemented in real life scenario should show that the it successfully detects the abandoned object without any human intervention.

Keywords: Abandoned object detection, Foreground Detection, Blob detection, Unmanned surveillance.

I. INTRODUCTION

Video surveillance is emerging as an efficient way to monitor high risk areas, such as, airports, malls, etc. Over the years te-rror threats have been rising, all over the world. But when a s-urveillance camera covers a large area, it is difficult as well as expensive, often times inefficient to employ people to monitor the camera feed. A contemporary approach is to provide previ-ous definition of how the object will appear but this will result in the efficiency, of the detection system, to depend on human accuracy. The use of video surveillance is found to be so effe-ctive not only in monitoring an area, but also providing evide-nce [4]. As a result, most security teams, an law enforcement authorities depend heavily on surveillance cameras.

II. RELATED WORKS

Due to the rise in overall picture quality, as well as, the increase in targeted areas, the research in the field of video surveillance is vast. One such method proposes the use of both appearance(dimensions, color, shape, etc.) and trajectory to track objects [1].

Various methods for recognizing and tracking trajectories have been previously proposed [5][6][9]. Research has been conducted to develop multiple approaches to conduct surveillance using tracking of people and objects [10][11].

Another method is to conduct semantics-based behaviour recognition, that depends object tracking [2]. While another approach proposes, finding the matching image in the collection given a probe image containing the same object. The different possible parameters of the bag of words (BoW) approach in terms of recognition performance and computational cost [3].

Different methods for improving the image quality in surveillance footage and then isolating parts of the images have been previously discussed [4][8].

III. OUR APPROACH

In this paper, we propose a method to track suspicious objects and movements. This is done by conducting foreground detection in the captured video. For this each and every frame of the video is isolated and analyzed, pixel by pixel. We use the blob detection approach to identify abandoned objects.

A. Foreground Detection

It is a technique of image processing, used to separate objects and people from overall background. In case of crowded pla-ces, the background is the infrastructure of the area. While, the foreground would be the people or independent structures (the objects that moved easily) as shown in Fig 1.

Fig. 1. Left: foreground detected. Right: original video.

The method proposed by Grabner et al. [7] is to divide a frame into many subregions and each subregion is used to train a cl-assifier by focusing only on a local region. The training samples are

$$S = \{(s_1, l_1), \ldots, (s_k, l_k) | s_i = [L_i, a_i, b_i, \Box x_i, \Box y_i, X_i, Y_i], \quad l_i \in \{+1, -1\}\} \qquad (1)$$

where L, a, and b are the color values, X, Y the coordinates, and $\Box x$, $\Box y$ the gradients along the x-direction and y-direction, respectively, and they are collectively treated as the features for point (pixel) i.

If for a point, the difference with respect to the background in terms of the corresponding color values and optical flow intensity values are larger than a threshold, then its label l_i is set to be +1 (foreground), otherwise it is −1 (background).

B. Blob Detection

Next, we track a single moving entity. This single entity is ass-umed to be a blob. A blob is a general patch with same density, which is different than that of the background and the disjoint patches that constitute the foreground.

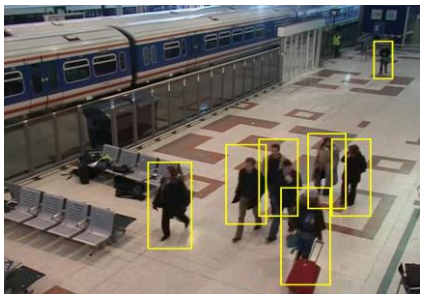

Fig. 2(a). Blobs detected.

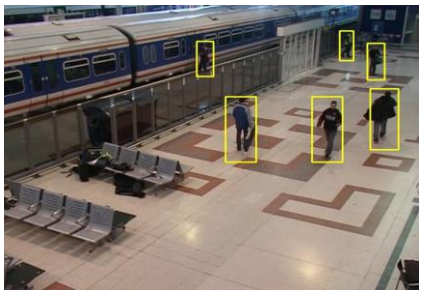

Fig. 2(b). Blobs after movement.

When a blob separates, the trajectories are tracked. The divisio-n of the blob that moves is usually a person, as opposed to the static divison that is usually the abandoned object.

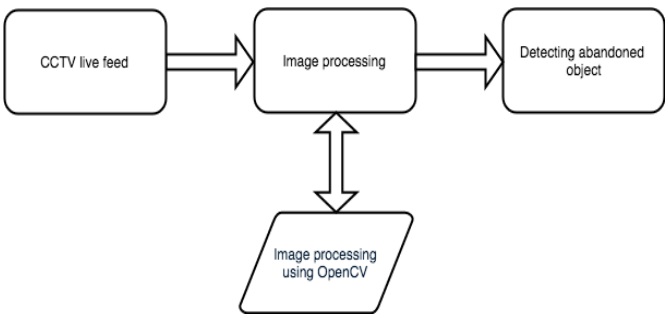

Fig. 3. Proposed System Architecture

IV. RESUTLS

Using this method, we obtain an automatic alert in case the system detects any abandened objects in the targeted area. The system accepts time boundaries that can be changed by the admin(user). Ony when the the boundary is reached, is the message alert sent out. Similarly, the phone number provided can be changed if needed.

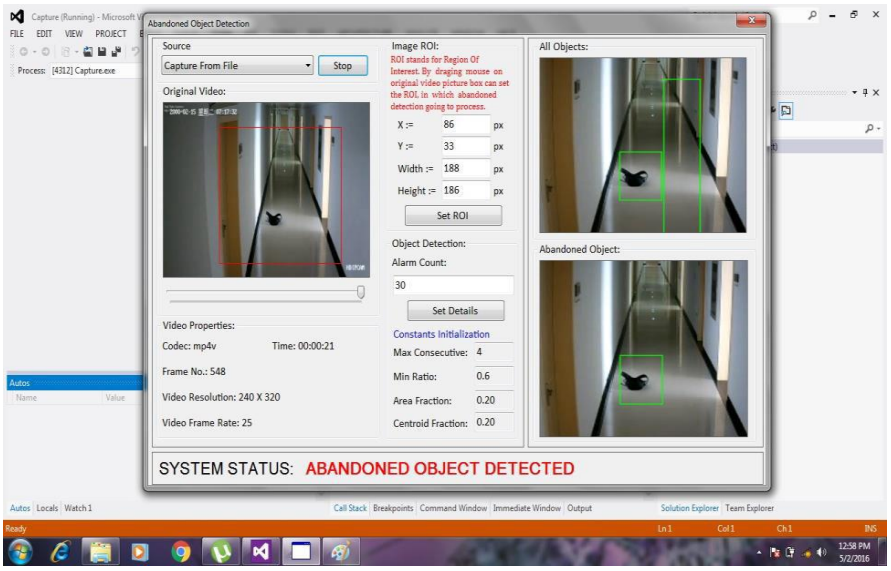

Fig. 4(a) : The object being detected.

Fig. 4(b) : The message alert delivered to the given mobile number.

V. CONCLUSION

Thus, we have proposed a method for identifying abandoned objects in crowded areas. We do so using foreground isolation and blob detection. Incase of suspicious activity an alert is sent to the security team. This propsed method focuses on abandoned objects, but can be used to detect any suspicious activities like fights, etc., on expansion.

ACKNOWLEDGMENTS

We would like to take this opportunity to thank our internal guide Prof. M. K. Kodmelvar for giving us all the help and gu-idance we needed. We are also grateful to Prof. N. B. Pokale, Head of Computer Engineering Department, Bhivarabai Sawant College of Engineering for his indispensable support. We would also like to express our gratitude to Dr. D. S. Bilgi, Principal of Bhivarabai Sawant College of Engineering, for his continued support.

REFERENCES

[1]. Yuan-hao lai and chuan-kai yang, "Video object retrieval by trajectory and appearance," IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS FOR VIDEO TECHNOLO-GY, VOL. 25, NO. 6, JUNE 2015.

[2]. M. Elhamod and M. D. Levine, "A real time semantics-based detection of suspicious activities in public scenes," in Proc. 9th Conference on Computer and Robot Vision, Toronto, ON, Canada, 2012, pp. 268–275.

[3]. M. Aly, M. Munich, and P. Perona, "Bag of words for large scale object recognition: Properties and benchmark," in Proc. Int. Conf. Comput. Vis. Theory Appl. (VISAPP), Mar. 2011, pp. 299-306.

[4]. N. Firth, "Face recognition technology fails to ind U.K. rioters", New-Scientist, London, U.K. [Online]. Available: http://www.newscientist. com/article/mg21128266.000-face-recognition-technology-fails-to-nduk-rioters.html

[5]. X. Ma, X. Chen, A. Khokar, and D. Schonfeld, "Motion trajectory based video retrieval, classification, and summarization," Video Search and Mining (Studies in Computational Intelligence)", vol. 287. Berlin, Germany: Springer-Verlag, 2010, pp. 53-82.

[6]. X. Chen, D. Schonfeld, and A. Khokhar, "Robust null space represen-tation and sampling for view-invariant motion trajectory analysis," in Proc. IEEE Conf. Comput. Vis. Pattern Recognit. (CVPR), Jun. 2008, pp. 1-6.

[7]. H. Grabner, P. M. Roth, and H. Bischof, "Is pedestrian detection really a hard task?" in Proc. IEEE Int. Workshop Perform. Eval. Tracking Surveill., Aug. 2007, pp. 1-8.

[8]. Remagnino, and T. Ellis, "Active video-based surveillance system: The low-level image and video processing techniques needed for implemen-tation," IEEE Signal Process. Mag., vol. 22, no. 2, pp. 25-37, Mar. 2005.

[9]. Dan Buzan, Stan Sclaro and George Kollios, "Extraction and Clust-ering of Motion Trajectories in Video," Proceedings of the 17th Intern-ational Conference on Pattern Recognition (ICPR'04).

[10]. I. N. Junejo, O. Javed, and M. Shah, "Multi feature path modeling for video surveillance," in Proc. 17th Int. Conf. Pattern Recognit., vol. 2. Aug. 2004, pp. 716-719.

[11]. L. M. Fuentes and S. A. Velastin, "Tracking-based event detection for CCTV systems," Pattern Anal. Appl., vol. 7, no. 4, pp. 356-364, Dec. 2004.