ISSN 2395-695X (Print)
ISSN 2395-695X (Online)

International Journal of Advanced Research in Biology Engineering Science and Technology (IJARBEST)

Vol. 2, Special Issue 10, March 2016

LOCALIZING INSTANTANEOUS ABANDONED ARTICLE USING BLOB

Rukumanikhandhan.C[1], Mathivannan.R[2], Nandhini.K[3],Gunasekaran.J[4]
[1]Assistant Professor, Department of CSE, K.S.Rangasamy College of Technology, Tiruchengode, Tamil Nadu, India
[2,3,4]Students, Department of CSE, K.S.Rangasamy College of Technology, Tiruchengode, Tamil Nadu, India
Email: rukumanikhandhan.c@gmail.com, *mathichnadran94@gmail.com,*
nandhu.cse.95@gmail.com,*guna4luckyboy@gmail.com*

Abstract

Instantaneous Object Detection by BLOB presents a novel framework for detecting flat and non-flat abandoned objects at a public place and determines which one remains stationary. In this paradigm abandoned objects are detected by matching a reference and a target video sequence. The source video is taken by a camera when there is no suspicious object in the scene. The destination video is taken by a camera following the same route and may contain extra objects. The two videos regulate to find the corresponding frame pairs and finally the abandoned objects are identified. Four plain but effective ideas are proposed to achieve the objective: an inter-sequence geometric alignment is used to find all possible wary areas, an intra-sequence geometric alignment to remove false alarms caused by high objects, a local appearance comparison between two aligned intra-sequence frames to evacuate false alarms in flat areas, and a temporal filtering step to confirm the existence of false alarms.

1. Introduction

In contemporary, surveillance has attracted increasing interest from homeland security, enforcement, and military agencies. The disclosure of suspicious items is one of the most important applications. These items can be grouped into two main classes, dynamic wary behaviors and static dangerous objects. The scope of this project falls into the latter category. Specifically, we investigate how to detect flat as well as non-flat static objects in a scene using a static camera.

Since these objects may have arbitrary shape, color or texture, state-of-the art category-specific (e.g., face/car/human) objects detection technology. To deal with this, we propose a simple but effective framework based upon matching a reference and a target video sequence. The reference video is taken by a static camera when there is no suspicious object in the scene (i.e.) a background image of the entire space, which has to be monitored, is taken initially. The target video is taken by a second camera and observing the same scene where suspicious objects may have been abandoned in the mean time (i.e.) a new image after the arrival of the objects is taken and is subtracted from the background image. When an object is found to be in the same place for a long time, an alarm sounds to alert the guards. To make things efficient, the videos are initially utilized to roughly align the two sequences by finding the corresponding inter-sequence frame pairs. In addition to it we use Blob Detection Algorithm. The following four ideas are proposed to achieve our objective.

1) An Inter-sequence geometric alignment based upon homographies to find all possible suspicious areas,

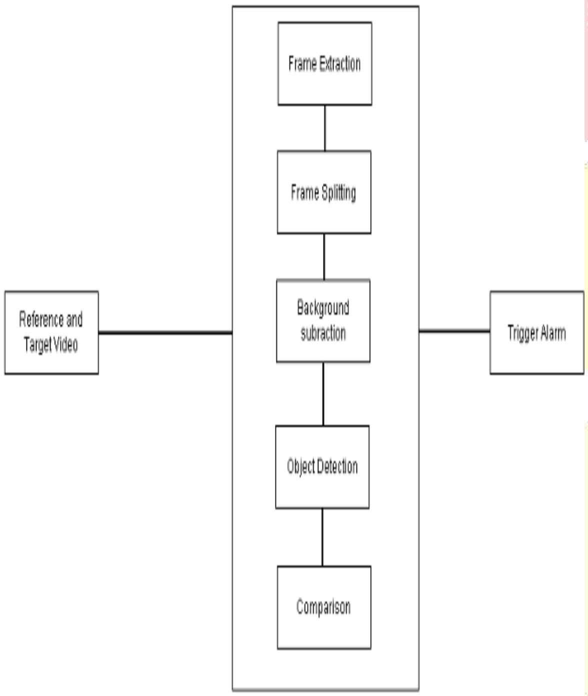
2) An Intra-sequence alignment (between consecutive frames of) to remove false alarms on high objects,

3) A local appearance association between two aligned intra-sequence frames to remove false alarms in flat areas (more precisely, in the dominant plane of the scene), and

4) A Temporal filtering step using homograph alignment to confirm the existence of suspicious objects.

Overall system design

Following are the overall system architecture of the



mo

ALGORITHM

- Step 1: Capture a reference Video 'R' without objects.
- Step 2: Store the Reference Video 'R' in the Database.
- Step 3: Capture the Target Video 'T' with moving objects.
- Step 4: Store the Target Video 'T' in the database.
- Step 5: Split both the videos 'R' and 'T' into frames.
- Step 6: Match the frames of Reference Video 'R' and Target 'T' Videos.
- Step 7: Implement SIFT Algorithm.
- Step 8: Subtract the background of the video 'T'.
- Step 9: Detect the flat objects 'F1'.
- Step 10: Compare the objects with the trained Dataset.
- Step 11: Identify the suspicious objects 'F1'.
- Step 12: Trigger the alarm.

FRAME EXTRACTION

Obtain the reference and target videos and extract them in the form of frames. In order to extract valid information from video, process video data efficiently, and reduce the transfer stress of network, more and more attention is being paid to the video processing technology. The amount of data in video processing is significantly reduced by using video frame extraction.

ISSN 2395-695X (Print)
ISSN 2395-695X (Online)

International Journal of Advanced Research in Biology Engineering Science and Technology (IJARBEST)

Vol. 2, Special Issue 10, March 2016

Experimental results show that the extracted frames can summarize the salient content of the video and the method is of good feasibility, high efficiency, and high robustness.

For this frame separation we use **SIFT Algorithm.**

SIFT ALGORITHM

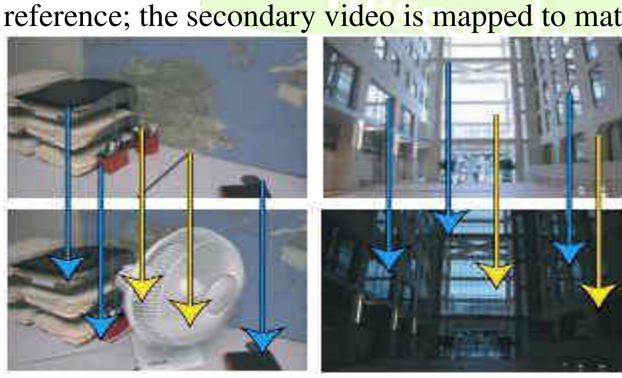
The steps followed in SIFT Algorithm are,

1. Scale-space Extrema Detection
2. Key point Localization
3. Orientation Assignment
4. Key point Descriptor
5. Key point Matching

FRAME MATCHING

After extracting the video into separate frames, compare them to find out the presence of any unidentified object in the scene. Given multiple still images of a video from the same camera. One can perform a variety of image analysis and synthesis tasks, such as foreground/background segmentation and constructing high dynamic range composites. The primary difficulty in this task is matching images that have substantially different). Video sequences of the same scene may differ from one another due to moving people, changes in lighting, and/or different exposure settings.

Our goal is to construct a mapping between two videos so that both videos can be manipulated in a shared spatial and temporal domain. One of the two videos is designated as the primary video, the other as the secondary. The primary video provides the spatial and temporal reference; the secondary video is mapped to match it.



ISSN 2395-695X (Print)
ISSN 2395-695X (Online)

International Journal of Advanced Research in Biology Engineering Science and Technology (IJARBEST)

Vol. 2, Special Issue 10, March 2016

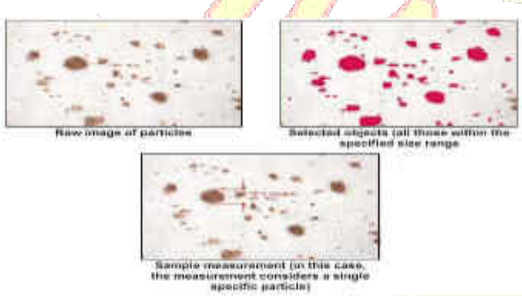
BACKGROUND SUBTRACTION

If any unidentified object is present, extract the mismatched image for analyzing it. Identifying objects from a video sequence is a fundamental and critical task in many computer-vision applications. A common approach is to perform background subtraction, which identifies objects from the portion of a video frame that differs significantly from a background model. There are many challenges in developing a good background subtraction algorithm. First, it must be robust against changes in illumination. Second, it should avoid detecting non-stationary background objects such as moving leaves, rain, snow, and shadows cast by moving objects. For this Background Subtraction we use BLOB ALGORITHM.

BLOB DETECTION ALGORITHM

A blob (binary large object) is an area of touching pixels with the same logical state. All pixels in an image that belong to a blob are in a foreground state. All other pixels are in a background state. In a binary image, pixels in the background have values equal to zero while every nonzero pixel is part of a binary object. You can use blob analysis to detect blobs in an image and make selected measurements of those blobs. Blob analysis consists of a series of processing operations and analysis functions that produce information about any 2D shape in an image. Use blob analysis when you are interested in finding blobs whose spatial characteristics satisfy certain criteria. In many inspection tasks, such as detecting flaws on silicon wafers, detecting soldering defects on electronic boards, or Web inspection applications such as finding structural defects on wood planks or detecting cracks on plastics sheets. You can also locate objects in motion control applications when there is significant variance in part shape or orientation.

In applications where there is a significant variance in the shape or orientation of an object, blob analysis is a powerful and flexible way to search for the object. You can use a combination of the measurements obtained through blob analysis to define a feature set that uniquely defines the shape of the object.



- Object detected by its attributes.
- Pixels are drawn.

Target Frame and **Extracted Object** shown below

Target frame

ISSN 2395-695X (Print)
ISSN 2395-695X (Online)

International Journal of Advanced Research in Biology Engineering Science and Technology (IJARBEST)

Vol. 2, Special Issue 10, March 2016

Extracted Object

OBJECT DETECTION

Analyze the kind of object present in the scene and if it is found suspicious, trigger the alarm. An object recognition system finds objects in the real world from an image of the world, using object models which are known a priori. This task is surprisingly difficult. Humans perform object recognition effortlessly and instantaneously. Algorithmic description of this task for implementation on machines has been very difficult.

ADVANTAGES OF THIS MODEL

- *False alarms can be avoided.*
- *All flat and non flat objects can be detected.*
- *Blob technique can detect objects irrespective of the image brightness.*
- *Only threat objects are detected.*

CONCLUSION

This paper proposes a novel framework for detecting flat and non-flat abandoned objects by a static camera. Our algorithm finds these objects in the target video by matching it with a reference video that does not contain them. Our framework is robust to large illumination variation, and can deal with false alarms caused by shadows, rain, and saturated regions on road.The future enhancements of our project will help to regulate traffic on roads. The system can be enhanced to function effectively with moving camera.

REFERENCES

[1] Hui Kong, Jean-Yves Audibert, Jean Ponce, "*Detecting Abandoned Objects With a Moving Camera"*

[2] D. Forsyth and J. Ponce, *Computer Vision: A Modern Approach*. Upper Saddle River, NJ: Prentice-Hall, 2002.

[3] S. Guler and M. K. Farrow, "Abandoned object detection in crowded places," in *Proc. PETS Workshop*, 2006, pp. 99–106.

[4] R. Hartley and A. Zisserman, *"Multiple View Geometry in Computer Vision*" 2nd ed. Cambridge, U.K.: Cambridge Univ. Press, 2003.

[5] H. Kong, J.-Y Audibert, and J. Ponce, "Vanishing Point Detection for Road Detection," in *Proc. IEEE Conf. Computer Vision*, 2009, pp. 96–103.

ISSN 2395-695X (Print)
ISSN 2395-695X (Online)

International Journal of Advanced Research in Biology Engineering Science and Technology (IJARBEST)

Vol. 2, Special Issue 10, March 2016

[6] D. Lowe, "Distinctive Image Features From Scale-Invariant Key- points," *Int. J. Comput. Vis.*, vol. 60, no. 2, pp. 91–110, 2004.
[7] F. Porikli, Y. Ivanov, and T. Haga, "Robust abandoned object detection using dual foregrounds," *EURASIP J. Adv. Signal Process.*, vol. 2008,no. 1, pp. 1–11, 2008.