Objects Detection in Video Surveillance System

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Abstract—More than ever before, it is important to maintain the safety and security of citizens, public infrastructure, buildings. This paper is concerned with video surveillance systems. With the growing quantity of security video, it becomes vital that video surveillance system be able to support security personnel in monitoring and tracking activities. In this paper is described new video surveillance system.

Keywords—video surveillance systems, security personnel, detection of removed luggage and abandoned luggage.

I. INTRODUCTION

Video surveillance is an active area of research. Object detection and tracking in video surveillance systems are commonly based on background estimation a subtraction. The primary focus of today’s video surveillance systems act is the application of video compression technology to efficiently multiplex or store images from a large number of cameras onto mass store devices (video tapes, discs) [4].

From the perspective of real-time threat detection, it is well know that human visual attention drops below acceptance levels, even when trained personal and assigned to the task of visual monitoring [9]. On the other side, video analysis technologies can be applied to develop smart surveillance systems that can be aid the human operator in real-time threat detection [1]. Specifically, multiscale tracking technologies are the next step in applying automatic video analysis to surveillance systems.

Application of visual surveillance include car and pedestrian traffic monitoring, human activity surveillance for unusual activity detection, people counting, etc. A typical surveillance application consists of three buildings blocks: moving detection, object tracking and higher level motion analysis.

Several video surveillance products are available on the market for office and home security as well as remote surveillance. They monitor a home, an office, or any location of interest, capturing motion events using webcams or camcorders and detect abnormalities [7]. In the case of webcams, the visual data is saved into compressed or uncompressed video clips, and the system trigger various alerts such as sending an e-mail.

II. VIDEO SURVEILLANCE SYSTEM DESCRIPTION

After classifying an object, we want to determine what it is doing. Understanding human activity is one of the most difficult open problems in the area of automated video surveillance. Detecting and analyzing human motion in real time from video imagery has only recently become viable with algorithms. These algorithms represent a good first step to the problem of recognizing and analyzing humans, but they still have some drawbacks. Therefore the human subject must dominate the image frame so that the individual body components can be reliably detected [6].

Tracking accessibility of people into the rooms, where is enter for the employees only. At airports, stations, schools and etc., the security is very important for prevention of employees and non-employees.

The system comprises the function of object detection, tracking, recognition and classification. The problem of object detection has been tackled using statistical models of the background image [5, 7, 8], frame differences techniques or a combination of both [6]. Several techniques have also been used for object tracking in video sequences in order to cope with multiple interacting targets.

We designed system (see Fig. 1) that works follows. We have video output from CCD camera. This video output is

![System block diagram](image-url)
divided to video sequences that are input for process called preprocessing. To recognition moving objects on the background, head detection and luggage detection we using the tracker. Tracker containing following blocks: Motion Detector, Head Detector, Image Tracker and Region Tracker. Tracking output is recognized in recognition block. Recognition block contained two blocks: Classifier and Personal Recognition. Data from recognition output are compared with data from Image Memory. Image memory is database containing a list of known faces, that have guarded enter to this room (employees faces). Learning is a process of personal identities creation.

First task of the optical correlator is linking together person with his luggage, case, package, etc. and if this person leaves guarded room with the same luggage, case, etc.

Second task of optical correlator is compare faces from tracker with database of known faces, that have guarded enter to this room.

III. RESULTS

A new method for a robust and efficient analysis of video sequences is presented; it allows the extraction of foreground objects and the classification of static foreground regions as abandoned or removed objects.

As a first step, the moving regions in the scene are detected by subtracting to the current frame a background model continuously adapted. Then, a shadow removing algorithm is used to extract the real shape of detected objects.

Finally, moving objects are classified as abandoned or removed by matching the boundaries of static foreground regions.

Figures 2 and 3 show two examples of abandoned luggage.

The long-term operation of such systems provides the ability to analyze information in a spatial-temporal context.

Despite the importance of the subject and the intensive research done, background detection remains a challenging problem in applications with difficult circumstances, such as changing illumination, waving trees, water, video displays, rotating fans, moving shadows, inter-reflections, camouflage, occasional changes of the true background, high traffic, etc [2].

The problem of remote surveillance has received growing attention in recent years, especially in the context of public infrastructure monitoring for transport applications, safety of quality control in industrial applications, and improved public security. The development of a surveillance system requires multidisciplinary expertise, including knowledge of signal and image processing, computer vision, communications and networking pattern recognition and sensor development and fusion [3].

Our system is preventing before entering forbidden person and leaving the suspicious luggage into the guarded room. In this luggage or package could be bomb, gun, drugs, etc. On the other side, big task is checking if some person steals the luggage, package or the other things.

Our system could increase security employees and the other people in schools, stations, airports, etc.

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REFERENCES


