

The Art of Moving Object Extraction, Detection and Recognition in a Video

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Detecting abnormal activity in the restricted area and tracking that activity is an essential world issue. The object without motion can be recognized easily, but the difficulty is in recognizing the object which is in motion. An object in motion constantly changes the position so it becomes difficult to detect and recognize that object. This paper discuss the procedure of recognizing the moving object and track it, which involved extracting the moving object form the background, detect them and finally recognize them using artificial neural network.

Keywords : Artificial Neural Network (ANN), Detection, Extraction, Frame, Recognition.

1. INTRODUCTION

Automatic detection and extraction of objects in video surveillance data is a very challenging problem in computer vision with the applications, such as traffic monitoring, automated remote video surveillance, monitoring border areas, buffer zones and restricted areas. Video cameras are a relatively inexpensive surveillance tool. Video surveillance systems are focused on detection, extraction and moving object recognition. Moving object detection [1] provides a classification of the pixels in the video sequence into either foreground or background. One of the common methods used to achieve such classification is background removal, also referred to as background subtraction [2]. Another approach used is frame differencing [3] where difference of intensity of the pixels of the two frames is taken and is compared with an adaptive threshold. This method is quite fast and has adaptation ability to the changes in the scene, it has a relatively low performance in dynamic scene conditions and its results are very sensitive to the threshold value. Object detection not only involves

a lot of human labour for labelling the images by putting the bounding boxes on the object of interest, but also has the difficulty of scaling the multiple objects. The object of interest can be of any type of objects, it is very difficult to train a comprehensive object detector that covers all types of objects. So object recognition is described as one that can categorize moving objects into human, vehicles and animals.

Moving regions obtained always include some isolated or small regions. And a moving object is always divided into several isolated regions. So combining moving regions is necessary, that is to say, two or more regions will be combined to one if they are near enough. Two or more regions are combined to one when nearest distance is below a threshold. The approach is to detect the object at motion using camera and extract the object and recognized the object within the restricted area.

Figure 1 describes the basic block diagram of the proposed system. The first box describes the input video frames in gray scale which contain the object of interest. During Detection and Extraction phase frame differencing and

previous image and Figure 6(c) represents the results after the frame difference between the current and previous frame. Figure 6(d) represents the result after conversion to binary image and Figure 6(e) represents the result after applying morphological operations such as DILATE, CLOSE and FILL.

Figure 7 is the extracted object after doing the labelling using the rectangle box. After the object is extracted it is resize to the standard size. The database of the object is saved and then trains the neural network using the data set of the object. Figure 8 shows Moving Object Recognition of Different Objects Namely, Bike, Animal and Car.

9. CONCLUSION

With the world wide increase in military conflicts, illegal immigrants and terrorism over the past decade, it is of utmost important to secure the restricted zones. Monitoring such areas currently rely on technology and man power, however automatic monitoring has been advancing in order to avoid the potential human errors that can be cause by different reasons. The recognition phase used neural network because of less computational cause and efficiency. The potential objects which are considered are: human, vehicles and animals. In Extraction of multiple objects, many applications have problems when object pass each other. In this system, frame differencing and region combination for detection and extraction were used. So when the occlusion occurs with multiple objects it will be recognized as the single object. So in future, this problem can be improved by using some other improve extraction techniques.

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