ISSN: 2455 - 9938

EIJO: Journal of Science, Technology and Innovative Research (EIJO–JSTIR)

Einstein International Journal Organization (EIJO)

Available Online at: www.eijo.in

Volume – 1, Issue – 2, May - June 2016, Page No. : 26 - 29

Vehicle Detection and Counting in Live Environment

[1]Pragya Jain, [2]Shubhangi, [3]Surbhi Sharma

E-Mail: [1]jainpragya230994@gmail.com, [2]shubhangichandani@gmail.com,[3]surbhisharma1181@gmail.com

ABSTRACT

Object detection and monitoring is important in the field of video processing. The growing need for automated video analysis has monitored generates a great interest in the algorithms. The frame extraction, background estimation and detection of objects on the first floor: The incoming video clip is analyzed in three main phases. The use of object tracking and counting; basically cars; It is important for traffic monitoring tasks. Traffic monitoring is important to steer traffic to control the density of traffic counting and traffic rules at traffic lights. In this paper, we have to avoid a technique human surveillance and automate the monitoring system. This system avoids the need to have an image of the background traffic. For a given input video signals frames are extracted. Selected images will be used to estimate the background. The background image is subtracted from each input video frame and the foreground object is obtained. After the post-processing technique, the count is performed [1].

Keywords: Background estimation, Background subtraction, Car tracking, Frame difference, Object counting, Object detection, foreground detection.

1. Introduction

The counting problem is the estimation of the number of objects in a still image or video frame. It arises in many real-world applications including cell counting in microscopic images, monitoring crowds in surveillance systems, and performing wildlife census or counting the number of trees in an aerial image of a forest. We take a supervised learning approach to this problem, and so require a set of training images with annotation. The question is what level of annotation is required? Arguably, the bare minimum of annotation is to provide the overall count of objects in each training image. This paper focuses on the next level of annotation which is to specify the object position by putting a single dot on each object instance in each image [2].

The efficient counting and tracking of multiple moving objects is a challenging and important task in the area of computer vision. It has applications in video surveillance, security, traffic rules violations and human–computer interaction. Recently, a significant number of tracking systems have been proposed. The major hurdles in monitoring algorithms are changing light intensities especially at late evenings and at night, weather changes like foggy atmospheres. Vehicle counting is important in computing traffic congestion and to keep track of vehicles that use state-aid streets and highways. Even in large metropolitan areas, there is a need for data about vehicles that use a particular street.

A system like the one proposed here can provide important and efficient counting mechanism to monitor vehicles (cars) density at highways Objects are defined as vehicles moving on roads. Cars and buses can be differentiated and the different traffic components can be counted and observed for violations, such as lane crossing, vehicles parked in no parking zones and even stranded vehicles that are blocking the roads. Vision-based video monitoring systems offer many more advantages. Surveillance and video analysis provide quick and practical information resulting in increased safety and traffic flow. The algorithm does not require the background image of road for this system. The background image is estimated from randomly selected input video frames. This is the greatest advantage of this method [1].

2. Body

Over the duration of this project we have experimented with a number of approaches to tackling the video analysis problem. There are a number of factors that make this a challenging problem. Firstly in order to obtain accurate counts we need to segment vehicles from the roadway and from each other. Secondly, the system needs to accurately track each vehicle over time even as it stops, starts and turns. The non-nadir view of the traffic camera significantly complicates the problem. Firstly vehicles can and will occlude each other as they move through the scene. Secondly perspective effects cause the vehicles to grow [3].

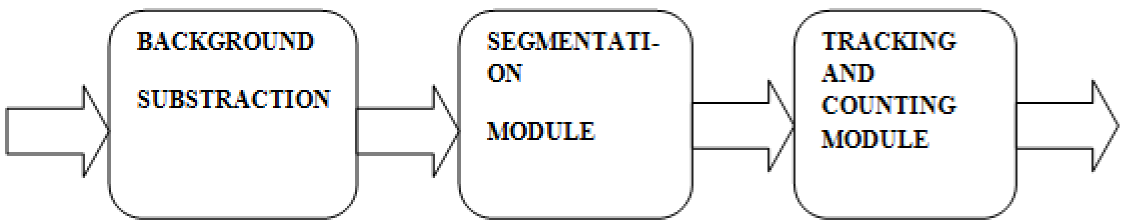

Figure 1: Architecture block diagram of the vehicle recognition

The system is divided into 3 basic stages, a background subtraction system that identifies salient regions in the image, a segmentation module that is responsible for segmenting individual cars.

The background subtraction system is currently implemented by modeling the color distribution at each pixel as a unimodal Gaussian and then measuring the Mahalanobis distance between the current color vector and this background model. More sophisticated approaches using multi-modal Gaussians to better model shadows were investigated but these more expensive models did not appear to offer significant improvements in performance [2].

3. Vehicle Count

Getting the input image

Imread () reads a grayscale or color image from the file specified by the string filename. If the file is not in the current folder, or in a folder on the MATLAB path, specify the full pathname. In this module we get two input image one is the image with vehicles and the other is a background image without vehicles in it.

Converting color image to gray:

Rgb2gray () converts both the images to gray images. Convert both the images into gray level by using double precision.

Foreground detection:

Set threshold value=11, find the difference between the two images by using abs () [absolute], abs can help find the absolute between the two images. If the difference between the two images is greater than the threshold value of 11 then those will be displayed as blobs at the output.

4. Morphological operation

Image adjust (imadjust ()) used to adjust the image intensity values to the color map. Gray thresh () used to set a suitable gray threshold value for the output image. Add Gaussian noise to the output image and filter it using wiener filter.Convert image to binary and fill holes if necessary. Open blobs of area greater than 5000, this will help detect vehicles.

Counting and density calculation

Count the no of blobs by using bwconncomp, the number of blobs gives the number of vehicles presents in the image. From the count the density of traffic can be estimated [1].

Counting by detection

This assumes the use of a visual object detector, which localizes individual object instances in the image. Given the localizations of all instances, counting becomes trivial. However, object detection is very far from being solved especially for overlapping instances. In particular, most current object detectors operate in two stages: first producing a real-valued confidence map; and second, given such a map, a further thresholding and non-maximum suppression steps are needed to locate peaks corresponding to individual instances. More generative approaches avoid no maximum suppression by reasoning about relations between object parts and instances but they are still geared towards a situation with a small number of objects in images and require time-consuming inference. Alternatively, several methods assume that objects tend to be uniform and disconnected from each other by the distinct backgroundcolor, so that it is possible to localize individual instances via a Monte-Carlo process ,morphological analysis or variation optimization. Methods in these groups deliver accurate counts when their underlying assumptions are met but are not applicable in more challenging situations.

The segmentation stage has proven to be the most challenging aspect of the vehicle tracking task. To date we have investigated two approaches to this problem. The first approach is a spatio-temporal analysis inspired in part by the pneumatic tube sensors that are commonly used for vehicle counts today. In this approach we specify a series of lines in the image that act as virtual pneumatic tubes and then record the extent to which each of these lines is occluded by the regions produced by the background subtraction phase. We then perform a spatio-temporal analysis of the signals associated with each track in search of patterns [3].

An approach that we are currently investigating proceeds by finding and tracking distinctive features in the video imagery. These feature trajectories can be obtained using the Lucas Kanade method or by detecting and tracking Harris corners. We then attempt to group the feature tracklets into coherently moving objects by exploiting the blob features extracted from the background subtraction process. The advantage of this approach is that it is insensitive to shadows since they do not induce coherent features tracks.

In summary, in our project we have been able to identify some promising approaches to video analysis that we hope will ultimately lead to a robust and effective car tracking and counting system. Our ultimate goal is to be able to demonstrate a system that is able to deliver accurate counts at 30 frames a second or better in a wide range of conditions. We are also hoping to develop an approach that could be implemented in real time on standard embedded processors like the ARM cores that are commonly used on camera equipped cell-phones. This would allow us to develop inexpensive embedded systems that could be widely deployed.[2]

5. Conclusions

In this article, we propose an efficient algorithm to count the moving object with the background suppression technology. First, we compute the frame difference (FD) between frames Fi and frame background. The "moving object will then be eliminated from the background. In post-processing, noise and shadow areas in which the moving object using a morphological gradient uses median filter without disturbing the shape of the object. This can be in real-time applications, the multimedia communication systems be used. It is to be proved in further work that the clarity of the image, the background suppression technique using is much better than the recording in the background art. The good quality of the segmentation is obtained efficiently. This article also describes an application of the traffic monitoring system

The aim of this study was in the beginning with the process of classification as an extension of the vehicle counting system. During the project period, the problems that are taking the most time getting a good separation between foreground and background, and the detection and shadow removal. Feature extraction is highly dependent on good data, spent on these topics to analyze the time and justified. The code has been used as a basis for this evaluation experiments.

6. References

[1]. Jun Yee Ng, Yong Haur Tay "Image-based Vehicle Classification System"11th Asia-Pacific ITS Forum & Exhibition, June 2011.

[2].Saroj K.Meher, M.N.Murty"Efficient Method Of Moving Shadow Detection and Vehicle Classification"International Journal of Electronics and Communication(AEU),665-670,2013 .

[3]. R. Chellappa "Vehicle detection and tracking using acoustic and video sensors", 2011.