International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 05 | May 2019 www.irjet.net p-ISSN: 2395-0072

Vehicle detection and Counting System using Morphological Operations

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Abstract - *Reconnaissance cameras are typically introduced at real street connections and crossing points in urban region for perception by human administrators. Rather than constraining the capacity of the cameras for these reasons, the pictures from the cameras can be caught and broke down for further basic leadership forms. This paper proposes picture handling calculations for traffic tallying, line length, speed estimation and vehicle grouping. Traffic tallying calculation received in this examination is done by watching changes in pixels esteems in the center of traffic paths. The line length estimation, vehicle arrangement and assurance of speed, a solitary line of pixels set along a traffic path are watched. The example of these pixels esteems are utilized to quantify the line length, length of person vehicle and to recognize the situation of a specific vehicle inside a short interim of time. Image processing techniques have been used to track the vehicles using the surveillance camera and count the vehicle. Various morphological operations have been undergone to analysis the vehicle detection thus, the accuracy of the proposed work will be 91%.*

Key Words: **Morphological techniques, Binarization, Edge detection, Top-Hat processing**

1. INTRODUCTION

Picture handling assumes a significant job in different ongoing applications running from medicinal imaging to example and item acknowledgment for various purposes. One such application is object identification of versatile focuses in a specific domain [1]. Vehicle location on streets is a case of such item location which is utilized for traffic investigation, screen what's more, control. Subsequently, an underlying advance for traffic controlling is vehicle discovery and arrangement utilizing traffic estimating procedures. Picture handling based procedures are a standout amongst the most broadly utilized systems which accomplish this target. Numerous calculations have been proposed associated with vehicle discovery and grouping. In [2], picture division and edge discovery strategies are utilized. In [3], foundation extraction and estimation procedures are utilized to detach the vehicles of intrigue. Additionally vehicle identification can be accomplished with the assistance of vehicle shadows [4]. This approach winds up troublesome if shadows of different items like overhead extensions cover with the shadows of vehicles. Morphological procedure can likewise be utilized for vehicle grouping. Arrangement of vehicles based on their sizes or shapes assumes an importation job in traffic the executives and stream control [5].

Regardless of the calculation or procedure being utilized, camera situating and the nature of camera play a significant and basic job in vehicle discovery. High elevation aeronautical camera is a case of camera situating which is regularly utilized because of its wide territory inclusion [6]. In our paper, we have proposed a system through which the vehicles are identified and grouped dependent on their sizes. The calculation depends on arrangement of morphological advances, picture differencing and thresholding. The investigations are done on outlines (still pictures) of street fragments utilizing close vertical situated cameras. Utilizing the proposed calculation, a triumph rate of over 85% is accomplished. Rest of the paper is sorted out as pursues: in area 2, brief portrayals of the exploratory situation along with the underlying preprocessing steps are talked about. In section 3, the genuine calculation dependent tense discovery also, morphological procedure is proposed alongside vehicle order. At long last end is given in section 4.

2. PROPOSED WORK

2.1 PRE- PROCESSING

As showed in the past segment, camera position assumes a significant job in vehicle discovery process. For our situation, as we are worried about the tallying and characterization of vehicles on street vertical or then again close vertical camera position is picked to cover the entire locale of intrigue. Some camera positions and the relating pictures taken by these areas are appeared in Figure 1. Camcorders are utilized to screen a street for a explicit term. The acquired video is broken into outlines at fixed interims. Prepared independently to get data with respect to the quantity of vehicles and their grouping at a specific moment of time. Figures demonstrates a square outline of the proposed framework for vehicle discovery what more,

characterization is. The edges are gone through two stages, preprocessing stage and after that vehicle extraction stage. The block diagram of the proposed work is shown in the figure 1

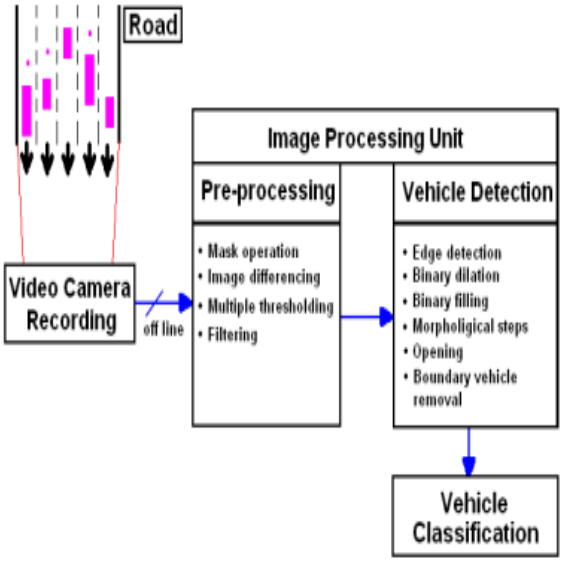

Figure.1 Block diagram of the proposed work

3. VEHICLE RECOGNITION CALCULATION

In this segment the real handling for vehicle recognition is performed. The first, edge recognition is connected on the picture got from the preprocessed calculation. The explanation behind utilizing edge recognition strategy is to get shape of the vehicles. We have utilized the, "Sobel edge" recognition to make least number of edges as we will likely have the external edges of the vehicle since the internal edges are immaterial for generally speaking vehicle identification [7]. Second, arrangement of straight parallel morphological expansions in three bearings on a level plane, vertically and through 45 degrees are performed. The consequence of the three enlargements. Clearly the vehicles are winding up increasingly unmistakable and yet, some clamor objects are increasing. Subsequently these undesirable items can give false discovery. Besides, double filling of the gaps is executed Openings are characterized as a lot of foundation pixels that can't be come to by filling in the foundation from the edge of picture. Note that the undesirable little items did not increment in size as after effect of the filling activity. So as to lessen the unpredictability of calculation, those items contacting the outskirt of the picture.

a

b

Figure.2 a) Original image b) Gray scale image

Now and again, when a solitary vehicle is broken into neighboring parts because of the past preparing steps, it is required to associate them else they could be identified as independent vehicles and gives false discovery. Hence, a second dimension enlargement guarantees the availability of such disengaged parts. The structure component utilized for this enlargement is the precious stone structure which is one of the most proficient structures in morphological enlargement and disintegration. The effect of this expansion is clear another casing appeared.

The blue transport on the outrageous right path has dark rooftop at three better places. Before applying the second dimension of expansion, the transport is separated into three sections. Unmistakably in the wake of applying the second dimension expansion, these parts are associated as a solitary vehicle. Despite the fact that the second dimension enlargements results in an expansion of size of the undesirable items, the extent of increment in the size of target vehicles and undesirable articles is same. Thus undesirable items could be effectively recognized.

4. MORPHOLOGICAL OPEATIONS

Binarization: Binarization process involves conversion of gray scale image into binary image.

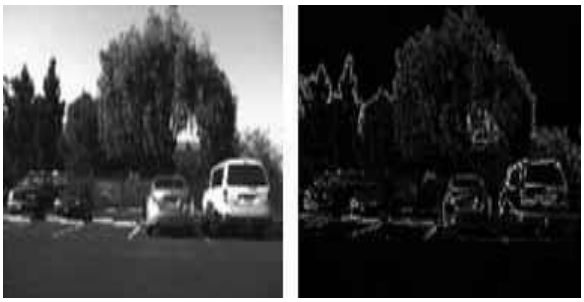

Figure 2 a) Binary image b) Edge image

Masking operation can be masked or combined the two images from top- hat transform and then add or ignore the objects. Add objects are detected. Non vehicle objects are ignored. Then the detected vehicles are used to counting.

Figure 3 a) Top-hat image b) Detected image

The centroid of each foreground object is calculated and counted. When the centroid of a vehicle is detected for the first time, normally in zones 1 or 2, its status is set to 0 (have not been counted). Then its position is tracked.

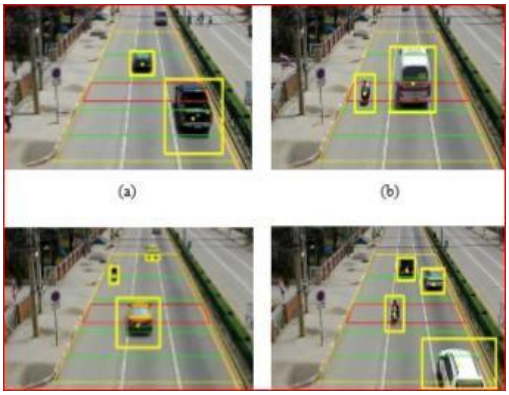

Fig. 4 Vehicle Counting

5. CONCLUSION

In this paper, we have built up a novel calculation for vehicle identification and characterization dependent on picture handling. By joining strategies for thresholding, picture differencing, edge identification and different morphological procedures, the proposed calculation gives a triumph rate of over 85% in both vehicle identification and characterization which thus can be very helpful for traffic investigation and the executives.

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