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Traffic Congestion Control using Surveillance Camera

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Abstract

A primary purpose of this research is to track a traffic situation from a traffic picture on the road for the Traffic Congestion Investigating Program by Image Processing.Then in a particular time, a client will search in advance for a traffic situation.The system provides an input to process a traffic picture from a surveillance camera in the network.The machine then detects congestion for traffic and gets the results in three traffic conditions including Flow, High, and Jammed.Eventually, for transport planning or intersection traffic control, a user can use the device.The system uses an image processing method to evaluate a traffic situation for implementation.

I. INTRODUCTION

There is a huge increase in rush hour gridlock these days, we are also facing numerous problems, such as congested driving conditions, mishaps, etc. By recalling these issues, we have responded to one of the appraches to reducetraffic blockage control by making sense.Identification and inclusion of vehicles is essential in the management of interstate traffic blockageThe main goal of vehicle detection, including gridlock video project in rush hour, is to create a system for programmed vehicle recognition and relying on expressways.A system was developed to efficiently classify and count complex vehicles.Insightful visual recognition of street vehicles is a key segment for developing selfgoverning intelligent transport frameworksThe technique of entropy veil does not involve an earlier study of street highlight extraction on static images.Distinguishing and monitoring vehicles in observation imagery using division with startup subtraction using morphological administrator to assess remarkable positions in a video outline structure.The edges are tallying which shows the number of zones of specific size, then the emphasis is unique to the vehicle regions and the vehicles are included in the area of road traffic

Objectives

- Detecting Multiple moving vehicles.
- Counting vehicles in video.
- Display count of cars

Hardware required

- Processor: Intel i5
- Ram : Minimum 2GB is required
- Hard Disk Space : Minimum 20GB is required
- Input : Video Sequence

Software required

- OS : Windows 10
- Software : Python 3.66

Open source libraries used

Distinguishing information can be used to refine the type of vehicle and also to fix the blunders caused by blocking.After the static vehicles have been registered, the foundation picture is removed from

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the video casings to obtain the dynamic vehicles at the forefront.On closer view, post handling is done by dynamic vehicles to reduce the clamor.

II. HAAR-CASCADE FILTER

Viola and Jones suggested hairlike highlights as an elective face position technique[2].The general idea was to represent an article as a course sorted out in a few phases by the basic component classifiers.This is a very quick strategy that performs face recognition as adequately as some other techniquesAs reported in , the technique performed several times faster than the BalujaKanade locator in the CMU+MIT reference test set and several times faster than the SchneidermanKanadeindicator.The classification of the pictures depends on the estimate of the specific highlights.For the most part, highlights are used instead of simple crude pixel esteems as they can function to encode explicitly appointed space data, but in this particular case as they are much faster to process.

Foreground Detection

Identifying information may be used to refine the type of vehicle and, in addition, to fix errors caused by blocking.The foundation picture is expelled from the video edges in the wake of enrolling the static vehicles to obtain the dynamic vehicles closer to view.Upon closer inspection,flexible vehicles are treated to lessen the Chaos.

Problem Solving

Current traffic control methods include manual vehicle counting or traffic counting using road magnetic loops.Besides being costly, the main drawback of these methods is that these systems just count.The current method of image processing uses a temporal differentiation approach which fails in the full extraction of vehicle shapes.It is very difficult to implement the effective contour method and very timeconsuming in regional monitoring, so in this task, the Adaptive Context Subtraction Method [3]for detection and the ostu method to solve all these problems

Image Segmentation

Image segmentation steps as follows:

The division of vehicle locales of intrigue. In this progression, areas which may contain obscure article must be distinguished.

- Next advance spotlights on the extraction of reasonable highlights and after that extraction of vehicles. The principle reason for highlight extraction is to diminish information by methods for estimating certain highlights that recognize the info designs.
- The last is characterization. It allocates a name to a vehicle dependent on the data gave by its descriptors. Theexamination is made on the scientific morphology administrators for division of a dim scale picture.

Vehicles Detection

Theidentification of the moving vehicle is in video analysis.It can be used very well in various jurisdictions, such video monitoring, traffic control and follow individual.There are three standard methods of motion separation outline comparison, entropy cover and optical stream technique.Edge distinguishing strategy has less mathematical multifaceted complexity, and it is anything but hard to implement, but generally allows a horrible show of separating the total states from specific types of moving crate

The present case and the reference picture are used for flexible base subtraction.Distinction is known as a moving vehicle between the present case and the reference edge above the mark.In any case, when the camera moves, the optical stream technique can discern the moving vehicle, but it requires more time for its computational complexity, and it is delicate to the clamor.The territory of motion generally shows up in real pictures very boisterous and the measurement of the optical flow involves only local estimate.So the technique of the optical stream can not identify the exact shape of the moving vehicle[1]

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From the above estimations, unmistakably there are a few inadequacies in the conventional moving vehicle location techniques

- Frame contrast can't identify the precise form of the moving vehicle.
- Optical stream strategy is touchy to the commotion

The following double image veil forms the tallying data frame.This image is studied in order to recognize the vehicle's proximity.Two factors are maintained that is tally which tracks the vehicle quantity and checks the countreg register which contains the vehicle's information.When another vehicle is encountered, it is first checked that it is already registered in the service if the vehicle is not registered, at that stage it is considered to be another vehicle and the test is increased, otherwise it is viewed as a partof a previously existing vehicle and the vehicle's proximity is denied.This concept is extended to the entire picture and the last vehicle inclusion is available in tally factor. A truly decent screening quality is achieved. Sometimes two vehicles are combined due to impediments and perceived as a single material

Algorithm

- Import PC vision library.
- Take video Dataset.
- Take a Haar-Cascade dataset.
- Use foundation subtractor.
- Then take parameters for getting rectangular edges.
- Use dark scale picture to change over shading to dim scale
- Then take a few parameters of street and use parameters to include autos in pictures .
- Now show the outcome.conclusion and future scope

Equations

The total of the pixels that exist in the square shape I r is

$$feature_1 = \sum_{i=1}^{N} W_i \times \text{RecSum}(r_i) = \\ = \sum_{i=1}^{N} W_i \times \text{RecSum}(x, y, w, h)$$

spoken to by ( ) Rec Sum I r .

Self-assurance picks the figures of, I N W and I r.

Because of [5], it was defined that 2 N = and dark square shapes) (0r have negative weight I W and 1 r have positive weight.In addition, the relation between the loads is determined by the differentiation between the area and the strongly contrasting square shapes.

$$-W_0 \cdot Area(r_0) = W_1 \cdot Area(r_1)$$

Assuming $W_0 = -1$, one can obtain:

$$W_1 = \frac{Area(r_0)}{Area(r_1)}$$

Therefore, for example, for the highlight (2a) of Figure 1, with a height of 2 h = and a width of 6 w = the product of the application of the element to a rectangular district located at, x y would be:

$$feature_{2a} = -1 \cdot \text{RecSum}(x, y, 6, 2) + \\ + \frac{6 \times 2}{2 \times 2} \cdot \text{RecSum}(x+2, y, 2, 2)$$

In order to quickly record the approximation of each element, a middle of the portrayal of the road image is calculated.This representation is called the Summed Area Table (SAT) or critical image.The approximation of the picture required at facilitates, (x y) is given by the total number of pixels in the picture above and on one side of, (x y):

$$SAT(x, y) = \sum_{x' \le x, y' \le y} I(x', y')$$

Where (,) I x y ′ is the estimation of the picture's pixel at organizes (, x y). The estimation of any RecSum(,) x y w h can be acquired by just four queries at the SAT.

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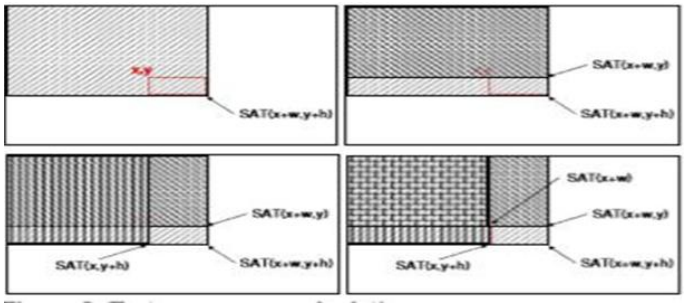
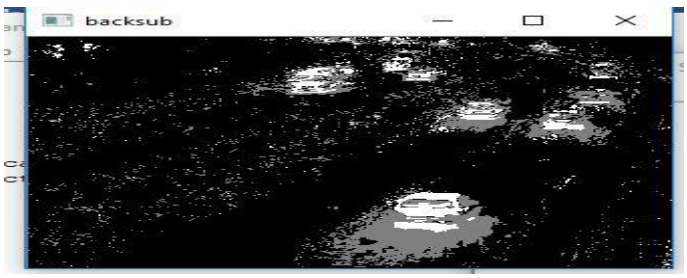


$$\begin{aligned} &\mathrm{RecSum}(x,y,w,h) = \\ &\quad = SAT(x+w,y+h) - SAT(x+w,y) - \\ &\quad - SAT(x,y+h) + SAT(x,y) \end{aligned} \tag{6}$$

III. RESULTS



IV. CONCLUSION

The traffic congestion can be reduced in such a way that the based on the refined road. The way in which the output shown as the principle on the image processing. Traffic congestion is a world wide issue. Maximum energy time and pollution are consumed here. So intial solution is identification of traffic congestion. Thus here the traffic congestion was identified and the number of vehicles crossed in both paths are identified. In future we would like to add a timer to control the traffic and monitor to reduce congestion.

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