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VEHICLE SPEED DETECTION IN SURVEILLANCE CAMERA USING IMAGE PROCESSING

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Abstract - In this thesis, propose the use of video image processing for video processing real time detection of vehicle speed. It aim s to segment vehicle s in a video and detect its speed in real time movements. The work consists of many stages until the calculation of vehicles speeds where it detects the speed of cars while they are moving. At first, the video is captured and the first frame is considered as a reference images that it will be later used for distance measurement. Secondly, the videos or The frame are segmented (binaries) and the vehicles are detected. Then, continuously, and using the saved reference image, the distance of each new frame is measured and based on the value of it the speed is calculated. The speed is calculated based on the distance and time of the vehicle in a specific frame. Finally, the speed is setto4bands based on their value: slow, medium, and fast. The system shows the value of the speed of the vehicle as it moves, as well as take a picture of the vehicle that exceeds the preset speed limit and stored in folder can be referred to.

Keywords- image processing; thresholding implementation; edge detection; background subtraction; tracking moving object.

I. INTRODUCTION

Image processing has been widely applied to traffic analysis for a variety of purposes. As traffic research field is very wide and it has many goals that include detection of queue, detection of incident, classification of vehicles, and counting vehicles. One of the most important of these purposes is to estimate the speed of a vehicle, a vehicle. Traffic congestion poses lot of problems for people. Because of this, many accidents occur. To reduce this problem, new approach has been developed for estimating the speed of vehicle. A radar technology was used to determine the speed on highways. But it has a disadvantage of high cost. Then a lidar detector was designed to detect the infrared emissions of law enforcement agencies lieder speed detection devices and warn motorists that their speed is being measured. Its disadvantage is it has to be held or placed at a static point. These drawbacks of speed detection techniques motivated to develop new technique for that purpose.

II. LITERATURE SURVEY

This technology has its flaws, for instance in situations of the absence of light the device may not be fully able to record accurate data about the vehicle speed, and the photo log that will be saved will most likely by blurry (Goda, Zhang &Serikawa, 2014).

One of the solutions that are suggested to overcome the dark situations in the image processing technology is using the headlight of the car while it's moving. By default the system will take a picture for any moving object, in this case the moving object will be the car, the picture will be depending on the shutter speed which depended on the environment that is surrounding the car, since the environment is dark the first object that will be detected by the camera is the car headlights.

Since the car is moving, and the camera is fixed the car headlights will be recorded as a light line, in these step the image will be processed, and the light line will be extracted from the picture, in the third step the system will project a transformation against an optional are from the road, this process will calculate the length of the light line but first in order for the system to work a distance of the an optional road are a must be known. Using the previously known length and the shutter speed the car speed can be determined. The advantage of this system is its low costs, and its ability to substitute the speed gun which depended on the radar technology, and needs an expert to use it.

III. PROPOSED APPROACH

This zone quickly talks about SDCS novel method, framework point by point structure and undertaking execution. SDCS can be confined into four dynamic stages; these are things disclosure, Things following, Speed estimation and Getting Article's Photograph Area for the articles that move within the streams of video is recognized as a massive, and troublesome, study issue.

Close by the in born advantage to has the ability to split the video into parts that move within the video stream and foundation parts, in addition to perceiving the points that move and gives a union status of quickness regarding

confirmation, social event, and action examination, this is what makes that later technique further effective in view of the fact that essentially "moving" pixels require to be taken into account.

A. Implementation the Algorithm

Proposed algorithm was implemented in a script using PYTHON. The flowchart shown in Figure below explains the proposed algorithm.

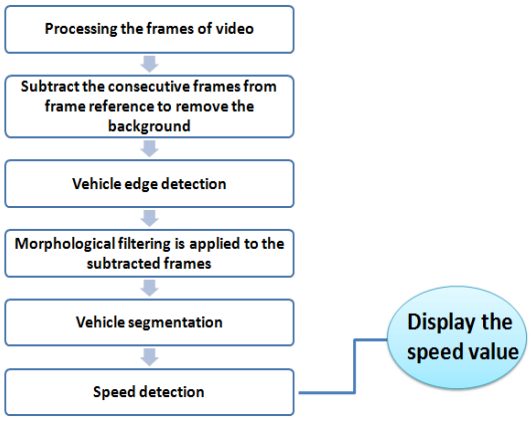

Figure 1: Detailed steps of the work

B. Measuring the speed of the car

After detection of the cars the calculation of speed will start considering two different factors. The first factor is the position of the car position of the car means the car localize in specific track on the street; in our case there are four tracks. The speed of car will be calculated then it will appear on the top of its track. The number of cars is shown in the left corner of the video.

C. Saved images of the high speed car

The car the move with speed more than 60 the program will capture it and save the images into the file considering the number of it and the track of the car. The first car on the left is given the number1 with speed of 67km/h.

Figure 2: The saved images of the high speed car in the first track

D. Parameters analysis for detection

The accuracy of detection calculated according to the comparison the human decision and the result of the program. The accuracy is given according to the formula:

$$Accuracy = \frac{calculated\ speed}{actual\ speed} * 100\%$$

E. Parameters analysis for speed measurement

The accuracy of speed measurement calculated according to the comparison the speed of the car using proposed algorithm with the real speed of the car.

IV. CONCLUSION

The increasing number of vehicles using the roads around the world has encouraged governments to be concerned about the security in the roads. Traffic lows were created to control the traffic flow all the time and to ensure the highest degrees of security. One of the most concerns of countries is the speed control of different vehicles flowing in the street. In the past, human traffic police were supposed to carry out the tasks of traffic control. However, the need for automated traffic control system with high accuracy and low cost has become more and more demanded.

Automated traffic control includes the use of traffic lights and speed measurement devices. This work is concerned is mainly concerned by the development of an algorithm that has the ability to detect moving vehicles in the street and measure their speeds. The algorithm will be also in charge of detecting the over speed moving cars and recording their images.

The proposed system mainly depends on the processing of images used to improve the video and split frames so that the cars can be adjusted and speed can be calculated. Main idea of the algorithm is to split the captured real time videos into frames of pictures at constant periods of time. The frames will be processed to detect cars in each frame and find the time between these frames. The speed of cars is then found by dividing the distance between frames by the time that separates them.

V. FUTURE SCOPE

A CCTV camera can be placed on the highway. If any vehicle has crossed the maximum speed limit then this camera will be triggered to take a picture of the vehicle. We can add voice announcement system. It will intimate the driver that he/she has crossed the over speed condition. We can implement the GSM technology. So that the nearest highway security authorities will be informed about the vehicle which has over speed. The drivers are made aware of their driving behavior and violations made ao that careful and conscious driving can be achieved.

VI. REFERENCES

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