PACE PERCEPTION BY EMPLOYING OPEN CV

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Abstract :- This paper targets to predict the speed of a vehicle with respect to the data from a recorded video source. Serving as the hypothesis, the paper portrays the various important procedure such as unequivocal Gaussian blend, models ,DBSCAN ,Kalman channel, Optical stream. The game plan and the delineation of procedures for correspondence of individual are included in the execution part. The type of vehicles, the nature of driving and the vehicle's position at the time of video capture is taken into consideration.

1.INTRODUCTION

In the recent years we can see the reisavast increase in the number of vehicles all around the globe. Along with the increase in number of vehicles increases the number of accidents. Therefore, it is important to limit the speed of the vehicles at certain zone so rare as. Radar speed measurement tools are commonly used forth is purpose which can be inaccurate in certain cases such as in sensing smaller vehicles with weaker echoes. Also it is difficult for these tools to detect vehicles changing in speeds too of tenor fast. Therefore, the raise a need for a better technique to detect the speed of the moving vehicles. Than using expensive sensors such as radars, the vehicles video streaming could be used forth is purpose. The video stream of the moving vehicle is given as an input, then it is passed through the filter for detecting its speed.

2. LITERATURE SURVEY

[1] "Vehicle speed detection system," in 2009 IEEE International Conference on Signal and Image Processing Applications. This paper presents a flat out response for completing a getting ready module on traffic cameras that is fit for following every vehicle in the camera outline and looking over its speed reliably. A season structure for various vehicle following is used that utilizations Kalman channel and Hungarian Algorithm to pick checks. A speed estimation structure is outlined that is sufficiently liberal to Work with camera feed from any edge without game-plan and camera mounted in any event stature of 7m.

[2] The system has been attempted PC made approaches in like manner as avowed conditions and speed measures have been gotten with most note worthy go of under 3kmph. Research of vehicle speed detection algorithm in video surveillance.

This paper, demonstrates another Speed Detection Camera System(SDCS) that is appropriate as a radar elective. SDCS uses a few picture getting ready frameworks on video stream in on the web-got from single camera-or pulled back mode, which makes SDCS fit for figuring the speed of moving articles keep in gupa central division from the standard adars issues. SDCS offers an en-over the top choice rather than traditional radars with a close precision or far unrivaled. SDCS frameworks can be withdrawn into four one of a kind stages; first stage is Objects exposure sort out. Which uses a flavor figuring subject to joining a flexible establishment subtraction methodology with a three-plot differencing estimation which gets a handle on the affirmed weigh to fusing fundamentally versatile establishment subtraction?

These condstage is Objects following, which consolidates three remarkable exercises, Object division, Object venturing, and Object run extraction. Articles following assignment considers the various potential states of the moving thing like; simple after, object has left the scene, object has entered the scene, and object cross by another article, and article leaves and another enters the scene. Third stages speed check organize, which is settled from the proportion of lodging seaten up by the thing to pass by the scene. The last stage is Capturing Object's Picture form, which gets the image of things that maltreatment past what many would consider possible. SDCS is recognized and tried in various examinations; it showed to have achieved a pleasing execution. Vehicle speed measurement technique using various speed detection instrumentation . Advanced technology of fersus various alternatives for collecting traffic data. However, different devices of ten result in different Accuracy to the true speed of the drivers. Lack of knowledge of accuracy between different devices is of ten cited as a common problem for both transportation researcher and practitioner. This paper discusses the most accurate traffic data measurement device when compared to the true driving speed of the driver using the V-BOX GPS validated with the dash box of the test vehicle. The paper illustrates and discusses the significant value R of the traffic data using scatter plot, root mean squared error (RMSE), mean absolute error(MAE)and mean absolute percentage error(MAPE).

[3] In this research paper , the camera was calibrated based on geometrical equations. The algorithm needs only a single video camera and a Cor2Duo computer processor with Matlab software which is installed. The software system is composed of 6 subsystems namely, the camera calibration unit the background update and removal unit the vehicle detection unit the speed measurement unit,the vehicle detection unit, the result analysis unit and the outstanding reference. Camera is set at a certain height above on a freeway. For extraction of foreground and background a method called combination of vehicle in each frame is calculated using the position of the vehicle in each frame.

The blob centroid determines the distance of the vehicle moving in consecutive frames and therefore as the frame rate of captured moves is known and speed is calculated. The average error of the detected vehicle speed is calculated the speed is +_ 7km/h for speed below 50km/h.

[4] This research paper is written for the purpose of analysing the performance of Raspberry Pi 2 in detecting the speed of objects, specifically vehicles. In this project the complete description of Raspberry Pi 2 is given that it is furnished with two USB 2.0 ports which are joined with LAN9512 combo center point/Ethernet Chip IC3, which is itself, a USB Gadget associated with the single upstream USB port on BCM2835. On the software side Raspbian OS is used with OpenCV-python installed in it. On the algorithm part, after initializing the system the video is read first and then color conversion is applied on it to remove the RGB color considered as noise while detecting the pixel of the object. Then in each frame of the video the object is detected and corresponding speed is calculated at last. In the result section the performance of Raspberry Pi 2 is described as 320p, 540p, 720p captured images give almost the same result with the only difference in memory usage to some limit. It is concluded that it uses 25% of its CPU usage and 600MB/1000MB of memory to run the system successfully.

[5] In this research paper two techniques linear and discrete motion speed detection were employed. In the first, the vehicle speed was calculated as the ratio of real distance covered by the field of view (FOV) and the time duration between the vehicle entering and exiting the FOV. Time duration is determined as the time between the time stamps at the beginning and at the end of the FOV. In the second, vehicle speed is calculated at different time stamps within the FOV with respect to initial startup time stamp. Vertical distance between the camera and the vehicle and the vehicle travelling distance in the FOV are determined by using trigonometry. The error in speed compared to speedometer was ±1.2m/sec.

[6] In this research paper, the system consists of vehicle detection nodes, the master node, and upper computer, the vehicle detection node mainly uses STM8L SCM with the geomagnetic sensor and the 433MHz wireless transceiver module. In this a new type of geomagnetic sensor (AMR) is selected to design a wireless vehicle detection system. The geomagnetic sensor is used because it can determine the presence of the vehicle in the field based on the change detected magnetic strength. Time is noted when a vehicle passes 2 nodes. final speed is calculated when distance is divided by the time difference. Test results show that the system possesses small size, low cost and high performance, and can actually be applied to outdoor parking spaces detection.

[7] In this research paper a proposal has been made to improve the existing car's speed detection system. In this project hardware as well as software are used. Camera quality has been given special privilege to detect the objects even in dim light. Storage scope has also been added with a network card so that if at any time the network gets lost while the system is being operated then after regaining the signal the data is again gathered from the storage and the process further continues from the point it was stopped. OCR to detect the VIN of a car has also been added in this project in case the speed gets out of the specified limit. For the storage purpose compression has also been applied on images and a web server is also being added to access the data remotely.

[8] In this research paper, the central and intelligent unit of the model is arduino. It includes the programming of Arduino according to layout whenever there is an over speed vehicle which cross the range of specific fixed RPM of that road then an alert in the form of message is send to the controlling authorities so that they can take necessary action. When the vehicle starts, IR sensor detects the speed and microcontroller on the Arduino Nano processes the data and it will notify GSM module when the vehicle overspeeds to send an alert message to the concerned authority, By referring to both figures, the complete program can be constructed later in Arduino IDE software.

3. PROPOSED SYSTEM

The below shown figure (fig 1) demonstrates the block diagram of our vehicle speed detection system. The block diagram below explains that firstly, a Video is given as input to the system. The given input video is at first preprocessed according to the requirements. From the processed video sample, the vehicle is detected using the filters. This vehicle is then tracked and analyzed in order to find its speed.

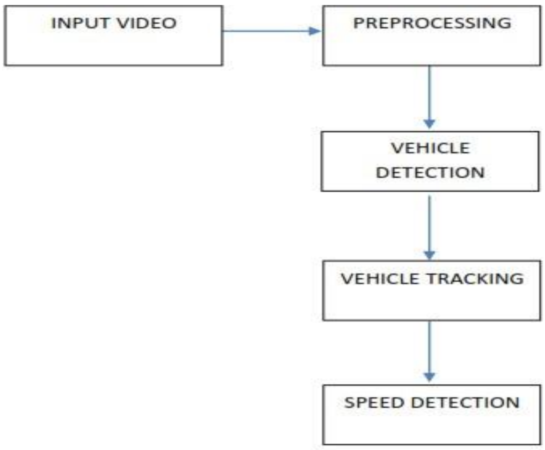

Fig. 1: Block diagram of vehicle speed detection system

3.1. SPEED DETECTION

Kalman channel along with the Optical stream isolates each improvement of the pixels which is the delineation of advancement of the vehicle. For finding out the speed of the vehicle, the system has to know the weigh to the pixel. The speed of the vehicle is enrolled by the common speed of all focus in that vehicle. Finally, we find the bundling number at which the article or the vehicle entered and left the scene. The speed estimation is done by figuring the measure of edges taken up by the vehicle to go in the scene and the length of each bundling is known. The in and out time taken by the vehicle in the scene is found and the speed estimation is settled.

3.1 TERMINOLOGIES

3.1.1 INPUT VIDEO

Our important need is to get the live stream of the moving vehicle using a camera. For this purpose, we make use of Open CV. The video captured from the camera is converted to gray scale for further processing. A Video Capture object is created for getting a live stream video. Its debate can be either the contraption report or the name of a video record. The video will be canny and in the event that it is incredibly high, video will be moderate (Well, that is the course by which you can demonstrate accounts in moderate movement). 25 milliseconds will be OK in regular cases.

3.1.2 PREPROCESSING

The moto behind preprocessing is to improvise the picture information in an image or a video. The number of subcomponents that apply various corrections or enhancement features to an input image. When one or more of the preprocessing options are enabled, the subcomponents operate the corrected image.

4. RESULT AND ANALYSIS

In this paper the Kalman channel and optical stream Lucas Kanade system are used to assess the speed of the vehicle. Firstly, the video is given as input to system. This input video is then preprocessed. This processed video is an alyzed using the above techniq

FIG 2: Tracked BLOBS of the vehicle

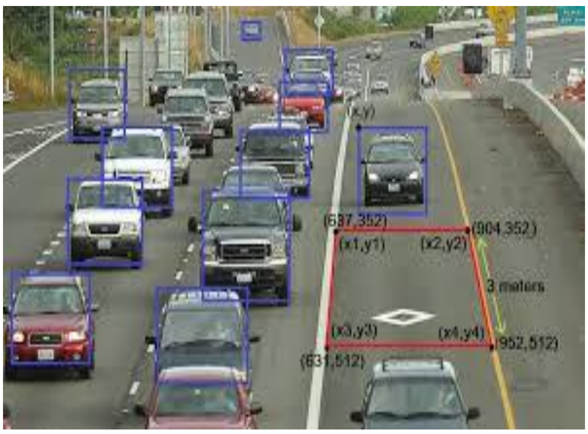

Fig 3:Detetion of speed of vehicles

Future Scope

According to our assumption the given proposal has a very good scope in the future. As already mentioned above, the system is trying to identify the behaviour of the driver to determine if he is moving with his/her actual speed under the vision of the camera or trying to make a fool of the system. Thus training the system in this manner for some consecutive years the system could be developed to take its own decision and record the data corresponding to different\ drivers or vehicles being passed regarding the actual or approximate speed with which they would be driven.

With its own intelligence it will be able to determine or prepare the complete database with the information corresponding to each driver it will make an analysis and then can send instant signal or any notification if any vehicle being captured or predicted as getting overspeeded. Due to such a capability of the software the hassle to install unlimited cameras or softwares at different locations in any specific area will be reduced to install a few only at required locations thus saving money and efforts.

5. Conclusion

In this paper, we propose that the Kalman filter algorithm is capable of estimating the accurate speed of the moving vehicle. Gaussian mix model was collaborated along with this algorithm for making accurate depiction of the moving objects. The combination of optical stream and the Kalman channel helps in predicting the results even when there is a low picture quality. In our future search, weaimtoim prove the DBSCA N division in order to recognize each article in gathering of the vehicles and also use flexible heaps of pixels for perceiving the speed from vertical advancements.

6. References

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