

Traffic Analysis by Means of Open-Source Computing

Vamsha^{1*}, T. Vaishnavi²

^{1,2}Student, Department of Computer Science and Engineering, Alva's Institute of Engineering and Technology, Moodbidri, India

Abstract: System in this paper is structured and executed with Visual C++ programming with Intel's Open CV video stream preparing framework to understand the constant programmed vehicle discovery and vehicle tallying. Freeways, roadways and streets are getting stuffed because of increment in number of vehicles. Vehicle location, following, characterization and tallying is significant for military, nonmilitary personnel and government applications, for example, interstate observing, traffic arranging, toll accumulation and traffic stream. For the traffic the board, vehicles discovery is the basic advance. PC Vision based procedures are progressively appropriate since these frameworks don't upset traffic while establishment and they are anything but difficult to adjust. In this paper we present modest, compact and Computer Vision based frame work for moving vehicle discovery and checking. Picture from video arrangement is taken to identify moving vehicles, so that foundation is removed from the pictures. The removed foundation is utilized in consequent investigation to recognize and characterize moving vehicles as light vehicles, substantial vehicles and cruiser. The framework is executed utilizing Open CV picture improvement packs and trial results are illustrated from continuous video taken from single camera. We tried this framework on a workstation fueled by an Intel Core Duo (1.83 GHZ) CPU and 2GB RAM. This thruway traffic checking procedure has been created by foundation subtraction, picture sifting, picture parallel and division strategies are utilized. This framework is likewise fit for checking moving vehicles from pre-recorded recordings.

Keywords: Computer Vision, Open CV, segmentation, video detection.

1. Introduction

Traffic tallies, speed and vehicle grouping are central information for an assortment of transportation ventures going from transportation wanting to present day wise transportation frameworks. Still 'Traffic Checking' and 'Data Systems' identified with order of vehicles depend on sensors for evaluating traffic parameters. Presently, attractive circle indicators are frequently used to check vehicles ignoring them. Vision-based video checking frameworks offer various favorable circumstances over prior techniques. Notwithstanding vehicle checks, a lot bigger arrangement of traffic parameters, for example, vehicle orders, path changes, leaving zones and so on., can be estimated in such sort of

frameworks. In huge metropolitan zones, there is a requirement for information about vehicle classes that utilization a specific roadway or a road. An order and checking framework like the one proposed here can give significant information to a specific basic leadership office. Our framework utilizes a solitary camera mounted on a shaft or other tall structure, looking down on the traffic scene. It tends to be utilized for recognizing and grouping vehicles in various paths and for any course of traffic stream.

2. Related Work

The above section says how to prepare a subsection. Just copy and paste the subsection, whenever you need it. The numbers will be automatically changes when you add new subsection. Once you paste it, change the subsection heading as per your requirement. For a long time following moving vehicles in video streams has been a functioning region of research in PC vision. Continuously framework portrayed in utilizes a feature-based technique alongside impediment thinking for following vehicles in blocked rush hour gridlock scenes. So as to deal with impediments, rather than following whole vehicles, vehicle sub-highlights are followed. A moving item acknowledgment technique depicted in, utilizes a versatile foundation subtraction procedure to isolate vehicles from the foundation. The foundation is displayed as a moderate time varying picture arrangement, which enables it to adjust to changes in lighting and climate conditions. Other prominent video-based traffic tallying frameworks utilize high-edge cameras to check traffic by identifying vehicles passing advanced sensors. As an example, ignores the computerized identifier, the change is perceived and a vehicle is checked. The time span that this change happens can be converted into speed gauges. When driving in obscurity condition, drivers typically turn on the headlights to get an unmistakable vision on the street. These headlamps produce brightening on the ground and this district will be delegated moving object. This front light location technique incorporates high intensity locale discovery and characterization for vehicles and bicycles is depicted in. Regardless of the enormous measure of writing on vehicle discovery and following, there has been pretty much nothing

*Corresponding author: vamshaspoojary@gmail.com

work done in the field of vehicle characterization. This is since vehicle characterization is a naturally difficult issue. Besides, location and following are essentially primer strides in the assignment of vehicle characterization.

1) Video System Design

Vehicle's location should be dead at varied condition wherever the sunshine and also the traffic standing evolving. In our planned framework, we have a tendency to acknowledge the traffic stream video from a camera and convert video into outlines concentrate reference foundations and performs identification of moving objects.

- The framework we propose contains of 3 phases

2) System Initialization

System gets initialized and came upon during this stage. Camera records nonstop stream of data and sends to the framework for investigation.

3) Background Subtraction

During this stage, heaps of edges are taken into center and around progressive examination furthermore, tasks foundation subtraction happens.

3. Vehicle Detection

During this stage, utilizing the deducted foundation image all the moving vehicles/articles is followed and tallied Our framework works in 2 modes, pre-recorded video mode and constant camera mode. We will offer prerecorded traffic stream video to location and checking of vehicles. Continuous camera mode application acknowledges the video from the camera and tracks the vehicles. A grouping framework just like the one planned here can give important info to a particular structure situation. Our framework utilizes a solitary camera mounted on a shaft or different tall structure, trying down on the traffic scene. It is utilized for recognizing and grouping vehicles in various ways and for any bearing of traffic stream. The framework needs simply the camera alignment parameters also, bearing of traffic for introduction.

A. Moving Object Detection in Opencv

Open CV represents Open-Source Computer Vision Library and is planned in C and C++ explicitly for expanded computational productivity, bolstered by most Working Systems. Open CV for giving successful answers for complex picture handling and vision calculation for continuous application for UG and PG understudies ventures. PC Vision (CV) applications require broad learning of computerized sign preparing, arithmetic, insights and observation. Model uses of the Open CV library incorporate Human- Computer Interaction, Object Identification, Division and Recognition, Face Recognition, Motion Recognition, Camera and Motion Tracking, Ego Movement, Motion Understanding, Stereo and Multi-Camera Adjustment and Depth Computation and Mobile Robotics. Open CV library contains more than 500 capacities which can be utilized in above application regions.

Open CV has numerous amazing pictures preparing capacities in this framework basic camera introduction is performed utilizing following code.

```
//Check if camera is working on the off chance that (! input)
```

```
{printf ("\n\t Input Error");}
```

B. Framework Design

1) Goals setting Before catching the video stream from net camera

It's relied upon to see current screen goals. This application might not produce needed outcomes, if the goals is below 1024 x 768. it's prescribed to vary the goals to 1024 x 768 or higher for ideal execution. The larger a part of the applications have to be compelled to perform such order and betting on existing place away video. For this reason, the choice for checking vehicles from store video is given.

2) Item recognition

This half is coded by utilizing Microsoft visual C++ with OpenCV library. Framework is meant to start obtaining photos from net camera. every edge is handled to find a moving article within the video. Action chart of the planned framework appeared within the Fig one.

3) Interface style

This half is structured up by utilizing Microsoft Visual Studio. Interface is figure to empower shopper to keep company with the framework and provides completely different decisions for characteristic vehicles. Since the framework runs on 2 distinctive modes, we've to convey a alternative of causative camera for real time and characteristic vehicles for pre-recorded mode. The framework which provides some capacities as given beneath:

- Activating camera in shading mode and grayscale mode
- Detect vehicles
- Detect vehicles from pre-recorded video stream
- Browse and play existing recordings

Recordings ar place away in commonplace .avi configuration utilizing XVID Codec. On the off likelihood that you simply expect to perform vehicle identification on any video, there's got to modification over the video to plain .avi organization utilizing XVID codec. Recordings once recognition ar place away within the C:\Vehicle Detection System\Saved Videos envelope. you'll get to them from that time, if necessary, within the future.

Vehicle numeration and classification: during this work, the detected vehicle regions are classified as light-weight vehicles, significant vehicles and motorcycles. we have a tendency to produce a log of a document giving following details.

- Number of Detected light-weight Vehicles
- Number of Detected significant Vehicles
- Number of Detected Motor-Cycles
- Total range of Detected Vehicles
- Time and Date of Recording

These log files ar hold on specially order on auxiliary storage device, relying upon the date.

C. Experimental Results

We tested this method on a laptop computer high-powered by AN Intel Core couple (1.83 GHZ) computer hardware and 2GB RAM. equipped with INTEX IT- 305 WC camera. we have a tendency to tested the system image sequences of route

scenes. The system is ready to trace and classify most vehicles with success.

4. Table

Table 1
Various Techniques and their merits and demerits

Techniques	Advantages	Disadvantages
Decision-Theoretic method	Wide area of application	Donot consider structure of object
Spatial correlation	Accurate when vehicle is well known	Time consuming Discrete distance measurement
Optimum Statistical Classifiers	Good for classification of sensed imagery created remotely by multispectral scanner	Limited application Difficult to apply in practice
Neural Network	Dynamic vehicle detection	Time consuming Complicated algorithm
Background Subtraction and Thresholding	Simple algorithm	Performance affected by noise, variation and illumination
Structural Method	Consider structure of object, suitable for object boundary detection	Narrower area of application e.g. string recognition

5. Figures

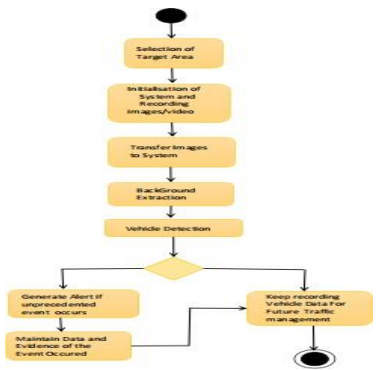


Fig. 1. Open-Source Computing Vision library

6. Conclusion

Because of increment in road, roadways and traffic clog, there is a tremendous measure of potential uses of vehicle discovery and following on freeway and expressways. In this paper we have shown vision-based framework for compelling location also, tallying of vehicles running on streets. The

fundamental point of our framework is to identify the occasions our framework is to identify the occasions of vehicles by breaking down camera pictures with the assistance of PC vision. Vehicle checking procedure acknowledges the video from single camera and distinguishes the moving vehicles what's more, tallies them. Vehicle identification and checking framework on parkway is created utilizing Open CV picture advancement packs detection Narrower area of application e.g. string recognition.

References

- [1] J. K. Author, "Title of thesis," M.S. thesis, Abbrev. Dept., Abbrev. Univ., City of Univ., Abbrev. State, year. O. Williams, "Narrow-band analyzer," Ph.D. dissertation, Dept. Elect. Eng., Harvard Univ., Cambridge, MA, 1993.
- [2] J.Thou-Ho Chen, Jun-Liang Chen, Chin-Hsing Chen and Chao-Ming Chang, "Vehicle Detection and Counting by Using Headlight Information in the Dark Environment" in IEEE 2007 International Conference on Intelligent Information Hiding and Multimedia Signal Processing IHMSP07, Kaohsiung, Taiwan, Nov. 26-28, 2007. pp. 519- 522
- [3] J. Kun and Z. Vamossy, "Traffic monitoring with computer vision," Proc. 7th Int. Symp. Applied Machine Intelligence and Informatics (SAMI 2009)
- [4] C. Stauffer, W.E.L. Grimson, learning patterns of activity using real-time tracking. IEEE Trans.Pattern Anal. Mach. Intell. 22(8), 747-757 (2000)
- [5] Leibe B, Schindler K, Cornelis N, Van Gool L. Coupled Object Detection and Tracking from Static Cameras and Moving Vehicles. IEEE Transactions on Pattern Analysis and Machine Intelligence. 2008; 30(10): 1683-1698.
- [6] D. Beyer, P. McLauchlan, B. Coifman, and J. Malik, "A real-time computer vision system for measuring traffic parameters," in Proc. IEEE Conf. Computer Vision and Pattern Recognition, Puerto Rico, June 1997, pp. 496-501
- [7] K. P. Karmann and A. von Brandt, "Moving object recognition using an adaptive background memory," in Proc. Time-Varying Image Processing and Moving Object Recognition, vol. 2, V. Capellini, Ed., 1990
- [8] C.C.R. Wang, J.J.J. Lien, "Automatic vehicle detection using local features—a statistical approach," 9(1), 83-96 (2008) Surendra Gupte, Osama Masoud, Robert F. K. Martin, and Nikolaos P. Papanikolopoulos, Detection and Classification of Vehicles, in Proc. IEEE Transactions On Intelligent Transportation Systems, Vol. 3, NO. 1, March 2002
- [9] B.F. Lin, Y.M. Lin, Fu Li-Chen, P.-Y. Hsiao, L.-A.Chuang, S.-S. Huang, M.-F. Lo, integrating appearance and edge features for sedan vehicle detection in the blind-spot area. IEEE Trans. Intell. Transp. Syst. 13(2), 737-747 (2012)
- [10] Kanhere, Birchfield, Sarasua, Whitney, "Real-Time Detection and Tracking of Vehicle Base Fronts for Measuring Traffic Counts and Speeds on Highways" in Transportation Research Board Annual Meeting, Washington, D.C., January 2007. TRB Paper Number: 07- 3308
- [11] Neeraj K. Kanhere, Stanley T. Birchfield, Wayne A. Sarasua, Tom C. Whitney, Real-time detection and tracking of vehicle base fronts for measuring traffic counts and speeds on highways", Transportation Research Record, No. 1993. (2007) Nilesh J Uke and Ravindra C Thool, "Cultivating
- [12] Research in Computer Vision within Graduates and Post- Graduates using Open Source", International Journal of Applied Information Systems 1(4):1-6, February 2012 <http://sourceforge.net/project> [Last Accessed: 21st June 2010]
- [13] OpenCV <http://opencv.willowgarage.c>