

Vehicle Count Using Different Algorithms

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Abstract: Increasing number of vehicles in the city is one of the major issue. In every country the population are growing very fast because of that it is very necessary to control the traffic. Traffic monitoring becomes the challenging task. The fast growing traffic increases the different problems like traffic jams, congestion and accidents. It is very necessary to improve the traffic management. We have to use advance version of techniques to improve the traffic management. This paper propose the different algorithms which is used to detect the vehicles and it is very help full for control the traffic. For controlling the traffic or related problem it is necessary to know the exact or approximate number of vehicle count so this paper gives the overall view of different algorithms which is used in density count. And these algorithms are helpful in traffic management.

Keywords: Traffic management, Vehicle count, road traffic, Median filter, congestion.

I. INTRODUCTION

In this fast growing world traffic control becomes the very important part for the government. Many human life relies on the good traffic control. Due to the increasing number of population traffic control becomes very tuff task to handle. For the good traffic control we have to use or update our traffic system yearly. Mismanagement in traffic system leads to the unnecessary time waste, congestion and accidents. In many cities monitoring and traffic control becomes the serious problem. Unorganized traffic system increase the fuel loss and pollution in the environment which is also the serious issue. So it is very necessary to build the system which monitor the vehicles and control the traffic as possible as it can done. Vehicle count is the basic function to control the traffic. For perfect monitoring it is needed to count the vehicle in different pattern such as hourly , daily or monthly bases. Vehicle count is typically used to collect the information of traffic on particular area. As the population increases the number of vehicles are increases so it is very necessary to traffic monitoring staff to follow the new techniques and methods so that the approximate ratio of traffic is calculated and further steps are to be taken to control the traffic. The important point in the traffic management is to calculate or collect the density or the count of the vehicle. In this paper we study the different algorithms which are used to count the vehicles. These algorithms are very helpful for counting the vehicle. We discus the algorithm which can be important in different technique and give the density of the vehicle. These algorithms are used in different technologies or in different project as per the need. One of the method solve the traffic problem by measuring the density of vehicle on road. The aim of this work is to control the large volumes of road traffic data for the improvement of safe driving and easily monitoring . It helps to optimize traffic flow, avoid traffic congestion , minimize the bad effects of heavy traffic on the environment and prevent accident and safe the precious time . In this project we analysis the road traffic for vehicle detection. We gives the different method for calculating the vehicle count. These methods can be used in different project according to the requirement.



Fig1. Traffic monitoring

This paper include the Literature survey , different algorithm , advantages and conclusion . last part of the work are the references which are use in the project.

II. LITERATURE REVIEW

Many researches and works have been done on road traffic. Dharani S.J. et al. [1] give the algorithm to determine the number of vehicles and control the road traffic by calculating the density of vehicles on road. He work on the region of interest instead of whole image processing he only processes the interested area.

Naveen Chintalacheruvu and Venkatesan Muthukumar. [2]has proposed system which detect the vehicle based on video. He used the Harris Stephen corner detection algorithm. They implemented the video based detection system on embedded computer platform .

Suresh Babu Chandalasetty et al. [3] has proposed system to automate traffic monitoring system by making the identification of moving vehicle on road. He also proposed the neural network technique of data mining for the classification of big or small vehicle.

J. Choi. [4] proposes that the autonomous vehicle system is a demanding application for our daily life. The vehicle requires on-road vehicle detection algorithms. Given the sequence of images, the algorithms need to find on-road vehicles in real time.

E. Atkoćiunas et al.[5] proposed system in this a traffic light, an automobile will be stopped above an inductive coil and this will signal a green light. Unfortunately, the device does not work with most motorbikes. Using a passive system such as a camera along with image processing may prove to be more effective at detecting vehicles than the current system

R. O. Duda and P. E. Hart. [6] has proposed propose detection of road signs from stream of video frames. The technique here is a thresholding on RGB color space and binary masking for extraction of the road sign areas. This is the technique adopted here in this paper for extracting the ROI of road signs .

Tahere et al.[7]presents calculating of vehicles density in traffic images is a challenging research. He proposed a simple method for traffic density computation in multiple vehicle based on counting object pixels and assigning a distance index to each region of image that concentrates on time and computational complexity and accuracy in traffic density calculation.

H. Chinthaka N. Premachandra et al. [8] proposed the latest transmitter finding and tracking methods were planned utilizing high-speed camera image processing for a road-to-vehicle Visible Light Communication system. With the proposed methods, the entire LEDs in the transmitter can be used for achieving uninterrupted communication, which was not possible with previous methods.

Saket Bhardwaj and Ajay Mittal [9] proposed a comparison between various edge detectors and concluded that Modified declivity operator gives better result when compared to prewitt, sobel, canny, Roberts and LoG edge detectors. Modified declivity operator does not require preprocessing and it's a non linear differential operator.

Elena Stringa [10] proposes Morphological Change Detection algorithms for Visual Surveillance and remote monitoring applications. The algorithm proposed in their work is based on novel Morphological image processing in contrast with the regular change detection algorithms using MIP.

Ching S. Cheung and Chandrika Kamath. [11] present Various background subtraction methods are studied, analyzed and tested with urban traffic videos by using frame differing, adaptive median filtering, median filtering, kalman filtering and mixture of Gaussians.

T . Muhlbacher et al.[12] describe a complete frame work for building and validating regression models that allow the incorporation of expert domain knowledge in the process.

III. ALGORITHMS

There are different algorithms present for counting the number vehicles or finding the density of vehicle. Some of the algorithm are discus in this section.

- **Background Subtraction:** It is also known as foreground detection. It is used for segmentation. Background Subtraction is a image processing technique and image foreground is extracted for further processing. This method is widely used for detecting the moving objects from the video frame. The background subtraction method initiates the background first and subtracts the current frame from background frame. Mahesh C.Pawaskar et.al.[16]show the frame difference in background subtraction. In this current frame is subtracted from the previous frame. if the difference value is greater than the threshold the pixel is consider as the part of the foreground. Background subtraction provide the important cues for the various application for example humans poses estimation.

- **Edge Detection:**Edge detection is the process of identifying and locating sharp discontinues in digital image. The point at which brightness changes sharply are organized into a set of curved line segments called edges. The

classical methods of edge detection include convolving the image with an operator which return zero in uniform area otherwise it constructed to be sensitive to large gradients. Most of the shape information is enclosed in edges. There for we first detect the edges in an image and by using filters and then by enhancing those areas of image which contains edges, sharpness of the image will increase and we will get the clearer image. Chandrasekhar. et.al.[17] present a traffic control method by using edge detection method. In this captured image are compare with the reference image. In this two representatives of same object are paired together , any edge or its representation on image is compared and evaluated against the edges on other image. After that canny edge operator is used for edge detection of real time and reference images.

- **Morphological Operation:** Morphological image processing is the collection of non-linear operation related to the shape of the image. Morphology is based on the shapes of image, it is broad set of image processing operation. The morphological operations is applied on the input image and create the same size of output image. Morphological operation are work on the form, structure or shape of an image. In a morphological operation each pixel value of out put image is based on the comparison of corresponding input image.

- **Blob Detection:** Blob detection method is used to detected the regions in a digital image that are different in properties.A blob is a region of an image in which some properties are constant or approximately constant; all the points in a blob can be considered in some sense to be similar to each other. Pardip Singh Maharjan et.al.[18] present BLOB segmentation for vehicle detection. In this he used to convert the gray scaled image to binary image. In this after background subtraction several background pixel have same intensity level, so multilevel threshold with values T1 and T2 were used. After thresholding black background is converted into white color and detected objects are represented by black color and morphological operation are applied on image , vehicles are clearly distinguished.

IV. ADVANTAGES

Techniques	Advantages
Background Subtraction	Calculate sudden changes. Less calculation is needed. Easy to implement.
Edge Detection	Detects edge and their orientation. Smoothing effect to remove noise.
Morphological Operation	Erosion and dilation make possible to identify the imperfection of printed image. Can used Multi-structure structuring elements in different directions.
Blob Detection	Region of different properties are detected.

V. CONCLUSION

In this paper we discuss the various method for the vehicle detection. These techniques help to build the traffic control system. We can use these techniques in different project which is used for congestion control and traffic control. It is very necessary to improve the traffic system by using the new techniques so that we can decrease the road accidents and traffic jams.

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