Automatic Vehicle Detection and Vehicle Counting

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Abstract

This system is designed to detect and count the vehicle automatically for allocating a parking area in tourist place and intimating the tourist about the allocation area. For the process of counting and detection ,three algorithm has been used. The first algorithm is background subtraction, it subtracts the object from the background .After that multiple frames were created and corresponding objects is converted into Blobs. After background subtraction , the next process is done with mouse move prediction algorithm .In that process, current position and predicted position of each object is identified to find the distance travelled within a frame. The final process is multiple object tracking algorithm ,it tracks every object which enters the frame. Each and every object is tracked from start of the frame to end of the frame to count the vehicles. The tracked vehicle is then finally counted.In the existing system ,the detection accuracy is low due to overlapping between the vehicle. In the proposed system multiple object tracking algorithm overcome the overlapping and increase the detection accuracy.

I. INTRODUCTION

To achieve the vehicle count statistics on video, The first thing is to extract the moving objects from the static background, extracted images are converted in to blobs, the continuous blobs gives the accurate image from the image or video. The main moving object detection methods include multiple object tracking method, background subtraction method, mouse move prediction method.These three algorithm plays a major role in detecting vehicles.

A) Background subtraction:

Background subtraction method uses the grayscale difference between the corresponding pixel of the current frame image and the background image to detect vehicle. If the pixel difference is very large, consider this pixel has an object through, contrary, if the pixel difference is very small, in a certain threshold range, consider this pixel is background pixels.

B) Multiple object tracking:

Multiple object tracking algorithm is an important computer vision task which has gained increasing attention due to its academic and commercial potential. There are many different approaches have been proposed to solve the problem. Multiple object tracking shares the common challenges, and has some more challenging tasks to be tackled, such as identifying among multiple objects, frequent occlusion due to the crowd, initializing and terminating of the object tracking.

C) Mouse move prediction

Mouse move prediction algorithm is used to predict the current position and moving position of the particular object
.By means of that, moving object in the video can be easily recognized.

The purpose of this project is

1) To improve the accuracy level of the vehicle detection even in the rainy time.
2)To display the lists of availability of space in the tourist spot area to intimate the tourists.

II. LITERATURE REVIEW

The vehicle under several layers irrespective of all the environmental factors can be detected by means of background subtraction, multiple object detection, mouse move prediction Algorithm. This work is concerned mainly with deep architectures for accurate vehicle detection. [1]The Automated Vehicle detection of Highway Traffic Images. The main objective of this part paper was to detect vehicle automatically moving on the road. In this paper, a traffic image is used to test the proposed detection technique. Multiscale DMP closing profile is applied on the traffic image for the automatic vehicle detection in the proposed algorithm. Shape Index of the vehicle is used for identification of the vehicle. The following steps will be used to detect the vehicle in the proposed algorithm: 1) Input an image 2) Pre-processing
3) Differential Morphology profile 4) Thresholding 5) Filtering. [2]Vehicle detecting, tracking and counting for traffic control systems. This paper focus on obtaining binary images with noise removed , and then applying them to both blob detection and contouring procedures. It was tentatively estimated

that the accuracy of detection can be increased by implementing contouring method. Selection of control parameters is also an essential part in this proposed program, as it will affect the whole performance of the system.Potential growth of traffic congestion leads to a high demand of vehicle detection systems for an effective and low-cost traffic surveillance. [3] Automatic Vehicle Detection and Counting Algorithm . This paper is proposed for automatic vehicle detection and vehicle counting. the proposed algorithm can be divided into Preprocessing, Gaussian Mixture Background Modeling, Foreground Histogram Analysis, Pyramidal Lucas Kanade Method and Decision Making Process. Vehicle detection and counting at the selected ROI can be formed by a relatively simple algorithm. Since it is linked with a separate tracking algorithm or radar vehicle detection data at decision making process, it is possible to realize a better performance.[4] Video-Based Vehicle Detection and Tracking Using Spatio-Temporal Maps. Here proposed a new algorithm for video based vehicle detection and tracking called computer-vision based algorithm. In this paper, a computer-vision based algorithm for vehicle detection and tracking is presented, implemented, and tested. This new algorithm comprises of four steps: user initialization, ST map generation, strand analysis, and vehicle tracking. . It relies on a single, environment insensitive cue that can be easily obtained and analyzed without camera calibration. The approach uses spatio-temporal slices that combine to create diagonal strands for every passing vehicle. Vehicle count errors ranged from 8% to 19% in the tests, with an overall average detection accuracy of 86.6%. Considering that the test scenarios were challenging, such test results are encouraging.[5] An Efficient Approach for Detection and Speed Estimation of Moving Vehicles. This paper proposes a novel approach and technique so as to efficiently detect and track the vehicles.

[6] Fast Vehicle Detection and Counting Using Background Subtraction Technique and Prewitt Edge Detection. Here proposed a method to detect the vehicles in the scene based on the two steps. First step is the noise removal using the median filter.In the second step they use morphological operations and thresholding to detect vehicles and remove the other objects and noises on the scene.

III. EXISTING SYSTEM

In the existing system, magnetic loop detectors are often used to count vehicles passing over them. In addition to vehicle counts, a much larger set of traffic parameters such as vehicle classifications, lane changes, parking areas etc., can be measured in such type of systems A detection and

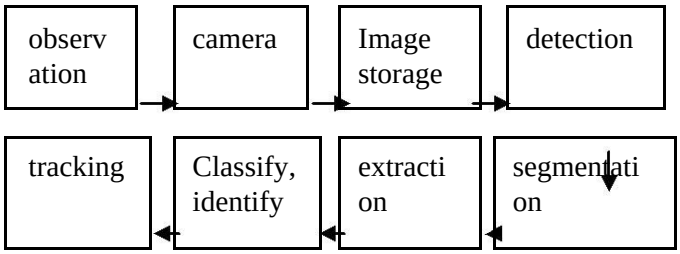

Fig. 1.Existing vehicle detectionSystem

IV. PROPOSED SYSTEM

The proposed system of our project aims to improve the efficiency of the object in terms of detection and time. The first thing is to accept the input file. The next process is background detection .next process is object detection. Then Gaussian blur is used. It is a widely used effect in graphics software, typically to reduce image noise and reduce detail. Two main methods are used.

- Thresholding
- Image binarising

Thresholding is the simplest method of image segmentation. From a grayscale image, thresholding can be used to create binary images. The next method is background subtraction.

Background subtraction, also known as foreground detection, is a technique in the fields of image processing and computer vision wherein an image's foreground is extracted for further processing (object recognition etc.). ... Background subtraction is mostly done if the image in question is a part of a video stream. There is a property of noise. Noise is generally considered to be a random variable with zero mean. Consider a noisy pixel, p=p0+n where p0 is the true value of pixel and n is the noise in that pixel. You can take large number of same pixels (say N) from different images and computes their average. Ideally, you should get p=p0 since mean of noise is zero.

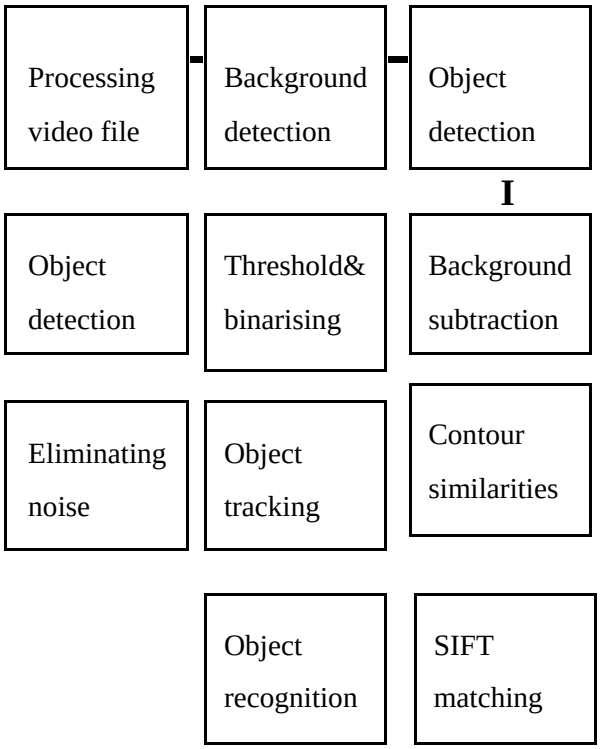

Fig. 2. Proposed vehicle detection System

Video tracking is the process of locating a moving object (or multiple objects) over time using a camera.It has a variety of uses, some of which are: human-computer interaction, security and surveillance, video communication and compression, augmented reality,traffic control, medical imaging and video editing. The efficiency of the classification and detection is computed by means of accuracy. Image Digitization and Background Extraction: For online applications, a live video capture module is developed to digitize live video signals into image frames from common video sources,.In this program, the background image is obtained by constructing an image using the median value of each pixel from a collection of images. Shadow Identification and Removal: Shadows may cause serious problems in video-based vehicle detection and classification. shadow identification and removal is among the few most important issues for vehicle detection and classification.

V . RESULT AND DISCUSSION

In this section, we will discuss about the accuracy level of the developed system. We have overcame the time accuracy of the existing system. This system counts the vehicle in the faster rate than the existing one.

VI. CONCLUSION

As this project get started when we pass the video as an input. In order to do that the system has to recognize the vehicle first. The video may consists of several things composed together. In this proposed work consists of vehicle detection, vehicle classification and counting of vehicles. This system will be implemented on a video sequence of frames recorded from a static camera. The vehicles are detected using background subtraction, multiple object detection and mouse move prediction algorithm. The vehicles are counted and then intimated. Vehicle detection and counting system on highway is developed using OpenCV image development kits.

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