

# A Survey on Automated Monitoring System for Vehicle Detection Using Different Techniques

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**Abstract** — In today's modern world, vehicle detection plays an important role for the application such as traffic surveillance, military, intelligent parking system and become most popular research for Intelligent Transportation System. It is used for controlling and managing traffic on road. As we know that vehicle detection is a very difficult problem for analyzing different types of vehicles on road due to having symmetrical objects from front and back with some variation in shape, color, size, etc. In this paper, a brief report on the techniques used for the vehicle detection process (VDP). In VDP, the method used with respect to segmentation, feature extraction and so on.

**Index Terms**— Video image, vehicle detection, background subtraction, SURF method, etc

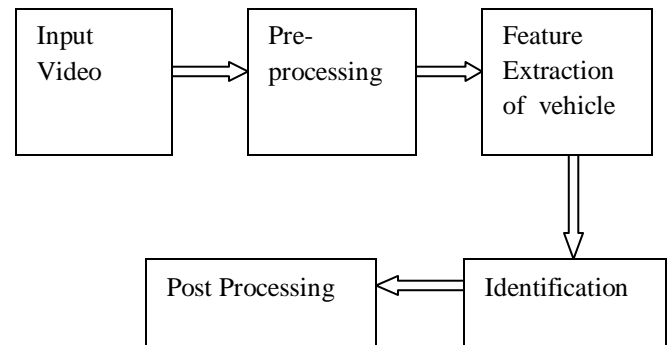
## I. INTRODUCTION

Vehicle detection is one of the difficult tasks due to having little variation in shape, color, size, etc. As we know that many techniques have been discovered for vehicle detection for analysis of different types of vehicles. Several researches have been done at that time, researchers facing many problems such as weather conditions like day, night, rainy and cloudy due to which system performance slows down [1]. During preliminary study shows that an automated monitoring system for detection of vehicles on road is able to reduce cost for traffic data collection, scene analysis and provide more useful, accurate information for supporting transportation systems [2]. The research which has been done till now mainly deals with performance, robustness, flexibility, accuracy in vehicle detection problems. Vehicle classification is also used which usually re-identifies for multi-sensor networks and event detection as well as application for traffic flow analysis and also for path tracing [4-7].

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**Fig1: Vehicle detection System**

## II. LITERATURE REVIEW

**YIYAN WANG [1].** The study in this paper is to analyze the existing limitations in Video Image Vehicle Detection System (VIVDS) for traffic surveillance and offer new contours of VIVDS for intersection monitoring in urban areas. The proposed methods for vehicle detection are GMM (Gaussian Mixture Model) [8]. For background modeling, GMM is applied, which is used to render background frames speedily and dependably. After that, use detection of vehicles based on color and texture that is highly developed for segmenting and detecting vehicles in predefined detection regions. At last, for post-processing, make use of OR mask for operation on flood-fill method to obviate holes in the detected vehicle mask. OR mask is computed by applying logical OR operation. The experimental results show that algorithms or methods used for VIVDS perform better than traditional VIVDS at urban intersections with respect to computational efficiency and detection rate.

**ZEZHI CHEN [2].** In this paper, vehicle detection is based on categorizing vehicles such as cars, buses, vans, and motorcycles and also counts them. The method proposed for research is a new background GMM and also makes use of shadow removal methods. The process of vehicle detection is done through CCTV from roadside as the moving vehicles are captured through camera while for accurate and better results for detection they apply both methods.

which will correctly and efficiently update the background model and after that tracking as well as classification is done through Kalman Filter and SVM (Support Vector Machine). These are also used through which accuracy is improved. The experimental result shows that by using those methods gives 96.39% for vehicle detection rate and 94.67% for classification accuracy which vary during weather condition and illumination.

**B.F. MOMIN [3]** During study of this paper, presents for detection of vehicle which is helpful for controlling and managing traffic in the urban areas. The method proposed for this paper is Symmetrical SURF as vehicles have symmetric features from front and back. First of all SURF descriptors are used for creating integral image from original image and after that SURF detectors are used extracting interest point from each frame of video and can easily be detected. Secondly, finding mirror for point of interest from the frame where interest point is detected. This is done through mirror transformation. The result for experiments shows that Symmetrical SURF is the best method for vehicle detection system as well as give accurate and outflank result in any weather condition. This is applied for real time applications, give good result then other methods used for vehicle detection instead of using any motion features.

**HABIBU RABIU [4]** In this paper, Vehicle Detection is done through single camera that was mounted on pedestrian bridge instantly looking at traffic scene. In this for detection background subtraction method by which make pair-wise subtraction is done between background frame and current frame. With help of this method location of current image is detected that have some value greater than set threshold. When vehicle is detected next step is to track vehicle for that well known method Kalman filter is used in this prediction or object state uses dynamic model after that correction step in this, correcting the prediction using observed model. so this method is applied to track labeled object throughout the detection zone. At the end segmented vehicles put together with all the labelled blobs, bounded boxes are go through classification stage. In this field, the goal of classifier is to identify the correct class of given object founded on assortment rules and features of object. At last this paper mainly focuses on feature extraction using method LBP (Local Binary Pattern) to extract unique property of an object. The proposed method was tested on 3400 frames of video sequence track record from urban intersection. The system classified every types of vehicle accurately. The experiment shows method used gives robustness in vehicle detection and tracking.

**MANISHA CHAPLE [5]** In the study of this paper, mainly focuses on the vehicle detection with better result and provide improved video quality by applying some noise removal methods. The method proposed during the work is most popular detection technique i.e. background subtraction which takes place in many phases, Preprocessing phase, testing the taken video by applying three types of noise salt and pepper, Gaussian and periodic for improving the frame quality. Then at segmentation phase, detected vehicle centroid is measured by applying regionprops function in matlab tool this helps to track vehicle by producing bounding corners and at last feature extraction phase, image corners, edges etc are identified. Optical flow method is also used for extracting the feature of object along with its dimension then it apply for tracking the vehicle. The experiment provide data about vehicle motility is observed and tracked using the above algorithms gives best result and also distance as well as velocity is counted for finding speed of car.

**ZHIMING QIAN [6]** During study of this paper highlights on multiclass detection and tracking system. The method proposed for the system are SVM and PCA, apply to make multiclass training samples. At starting step video input is taken for identify location of vehicle from image on basis of that feature are extracted from detected object. Vehicle classification use SVM that is one of learning algorithm which helps in solving binary classification problem and categorize vehicles with its different classes. Training sample data are pass into boosting learning algorithm for creating vehicle detector. SIFT (Scale Invariant Feature Transform) this method is apply for tracking object and for matching images. So for every detected vehicle SIFT features are extracted. Then detected vehicles are tracked into new video frame again comparing each features of vehicle from video information database. The experiment proposed that framework which is applied in project gives efficient and good result for detection and tracking of multiclass vehicle in traffic environs.

### III. OBSERVATION

During study of papers we observe and examine the existing problem of vehicle detection in real time condition and try to solve as well as eliminate all those problem step by step. On the basis of existing problem occlusion and other consequences better method will be adapt.

### IV. CONCLUSION

Various papers and technique must be deliberate at the time of literature review for vehicle detection. Different types method are applied for better result. The SURF (Speeded Up Robust Feature) perform better and it is effective for

real time application and also give higher accuracy for vehicle detection.

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