

# Vehicle Management System through Image Processing Tools

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**Abstract:** Vehicle detection from aerial image or satellite image is a type of the object recognition system. This system is one of the most demanding and interesting research topic from past few decade. It is known that the traffic is increasing day by day in the developing and developed countries.

Satellites images are generally used for geographical applications and weather forecasting. So, Satellites images may be also beneficial for the traffic detection system using Image processing. This work used simple morphological recognition method for vehicle detection using image processing technique in MATLAB which is best method for detection of cars, trucks and buses. It simply workout the full numbers of vehicles within the desired space in the satellite image and vehicles are shown underneath the bounding box as a small spots.

**Keywords:** Vehicle detection, vehicle controlling, Vehicle Management, Image Processing.

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## I. INTRODUCTION

The digital image has an array of pixel values which classify grey scales. First of all to convert it into black & white grey level threshold or its edge figure is used. Threshold was decided and its all pixels were of higher values (brighter) and they are thought to be parts of fractures, and all pixels with lower values (darker) were thought to be the top surface. Those Pixels were painted black whose values were more than the discrimination threshold, and the rest were painted white. Following are the three types of passive image sensing technologies, which are especially planned for goal finding.

### A. Video Camera

In present times the video cameras which are used to gather data for identification at less cost in comparison to rest of the image sensing techniques.

### B. Satellite

Satellite image detection is suitable when the large and wide area require execution at that point. For it the mechanism and preservation costs may be high. The various disadvantages of it do include its incapability to monitor and the less ground resolution on a cloudy day.

### C. Thermal Infrared

The sensors which were elaborated so far, helps in detecting in dark conditions permitted by thermal infrared image processing. Importantly, the aerial infrared image sensing is loaded with ability to watch over wide range.

## II. LITERATURE SURVEY

Semantic analysis, as a primary step of changes in satellite imagery required the detection of changes. Most notable of those kind rely on background modeling. In such type of category, a variety of different images of the scene are used to observe or we can say learn what the normal background look of the scene ought to appear so that given a specific brand new image, abnormal looking pixel can be detected as those changes.

Relatively less researched field in pc vision is 3-d change modification. Earlier approaches was using manually made 3-d website models to form correspondence between pictures so that we can apply modification detection algorithm rule.

For traffic monitoring by employing a circular array a PhD thesis was printed, that had 152 microphones, however only 143 of 152 of interest. Later the information were pre-processed so the elements are maintained between the frequency 2700Hz and 5400Hz, the 30-dimension feature vectors were extracted from the energy over every 0.2 seconds within the time domain. The PCA was processed to scale back dimension to twenty four before

827

classification with either Multilayer Perceptron (MLP), kNN, or Adaptive Fuzzy Logic System (AFLS). Correct number of car in every row is not clear, it was absolutely provided that they differentiated in every segment; and there were knowledge of total 1327 vehicles.

Moreover, it tried to handle the difference originated from the fact that few classes are simple to be learned than other classes by allocating misclassification price for every pattern though there was no logical explanation concerning however they were determined. The accuracy obtained are in 78.67%, 92.24%, 97.95% and for 5-class, 4-class, and 2-class and experiments respectively. For developing a compact and value effective recognition system these format of huge Microscope are not good enough, with the assistance of this study the great role is in initiating analysis on acoustic road vehicle recognition with fairly accurate results.

To hold out vehicle detection, envelope peaks and Short Time Energy (STE) were used. The chosen feature extraction algorithms for classification stage were; Zero-Crossing Rate (ZCR), "Spectral Centroid (centre gravity of spectral power distribution)", Subband Energy Ratio (SBER), "Spectral Rolloff Point", and LDA and MFCC.

### III. PROPOSED APPROACH

Traffic data is laid low with higher changes in satellite resolution & object-oriented detection methodology in satellite pictures; it may be even quicker as well as newly obtained within the large area images from satellite instead of the traditional data obtaining method.

#### A. Image Enhancement

Because of difficulty created by factors like chaos, illumination, weather, & shadow disturbance vehicle detection from the real satellite image becomes tough. So, to boost the vehicle identification rate and once the detection must be good, there is an associate degree urgency of enhancing the acquisition of the satellite pictures before the vehicle extraction.

As per this manner, the amount of pixels within a convinced range of gray can be roughly similar. A brief distribution of enhancement technique will be as under:

- Spatial domain strategies
- Frequency domain strategies

#### B. Morphological Algorithm

With the assistance of erosion morphology technique boundaries or edges of shape and an area can be extracted by applying on A by B and then subtracting the eroded A from A.

$$\beta(A) = A - (A \ominus B)$$

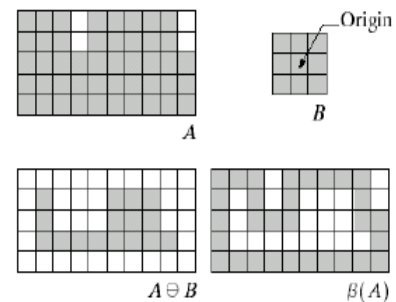


Figure 1. Boundary Extraction

#### C. Segmentation

A collection of classified elements is segmentation step output, segmentation techniques are relied on region or edge.

- Edge-based techniques
- Region-based techniques

#### D. Edge Detection

For the steps that are corrupted by white noise it is optimal for them. With reference to these areas optimality to the three criteria they are

- Detection criterion
  - Localization criterion
  - One response criterion
- #### E. OTSU Threshold
- Sliding Neighborhood Operation

To execute at one pixel at a time sliding neighborhood operation is employed, within value of assigned pixel in the output image being acknowledged by the submission of a function to the values of the consistent input to the pixel's neighborhood.

After relating this sliding neighbourhood method to the final images, the intense pixels close to larger objects, for instance vehicles, become brighter, however the intense pixels close to the irrelevant objects like lane markers stay about the similar bright. With the utilization of pre-processing step vehicles are going to be highlighted, and few irrelevant objects like lane markers can get dim. Later when sliding neighbourhood operation is applied, the Otsu Threshold is calculated, and a binary image is made.

- Detection of Dark Vehicles

To detect dark vehicles, Otsu Threshold is employed. Before applying Otsu Threshold, to the given image a sliding neighbourhood operation is applied. As dark vehicles need to be detected, each pixel is allotted minimum intensity of

its nearby element in a rectangular neighbourhood of a 3-by-3 matrix. As a result, comparing to the background dark vehicles becomes darker. After that when the sliding neighbourhood operation is applied, the Otsu Threshold is beneficial in changing test image in to a binary image.

#### IV. IMPLEMENTATION and RESULT

In the example picture, the background illumination is brighter in the focal point of the picture than at the under. In this progression, the illustration utilizes a morphological opening task to appraise the foundation brightening. Morphological opening is scraped area took after by long talk, utilizing a similar texture component for the two activities. The obvious task has the impact of evacuating objects that can't totally contain the organizing component. For additional data about morphological picture handling.

```
background = imopen(I,strel('disk',20));
```

To make a more uniform background, subtract the background picture from the essential picture, I, and after that view the image:

```
I2 = I - background;  
Figure, imshow(I2).
```

In the event that a red beacon point is distinguished, the subsequent stage is to recognize whether it is from a crisis vehicle or not. This is finished by distinguishing the flickering recurrence of red light identified in the picture arrangement and contrasting it with the standard utilized by the crisis vehicles.



Figure 2 (a)Real-time (b)Background  
(c)Subtracted (d)No. of vehicles = 3

#### V. CONCLUSION

In the last few years the satellite imaging has been used with success for geographical, geological applications, and

weather forecasting. With the advancement of engineering techniques, additional refined sensors offer higher resolutions. Now a day with quicker computer machines, the employment of satellite imaging has unlocked the fields of application and exploration. In this thesis we tend to apply image-processing methods on high-resolution satellite pictures to extract number of the detectable elements in given pictures. Thresholding with segmentation techniques are used to extract vehicles and highways from pictures that are containing roadways scenes. The color properties are accustomed to extract farm areas from field scene and cities. Various results of our work might be used to assist transportation agencies with respect to study of traffic density and trends followed across huge geographic areas.

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