Tracking and Identification of Multiple Vehicles

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Abstract- This paper presents an effective traffic surveillance system for detecting and tracking moving vehicles in nighttime and daytime traffic scenes. For nighttime, vehicles is identified by detecting and locating vehicle headlights and taillights using image segmentation and pattern analysis techniques, a fast bright-object segmentation process is applied to effectively extract bright objects of interest. The extracted bright objects are then processed by a spatial clustering and tracking procedure that locates and analyzes the spatial and temporal features of vehicle light patterns, and identifies and classifies moving cars and motorbikes in traffic scenes.

Keywords – Bright object extraction, Image Segmentation.

I. INTRODUCTION

Traffic datas are critical for traffic management and other transportation applications. Of the prevailing traffic sensors for collecting data, video cameras are among the most popular because they have the ability to capture not only traffic volumes, but also speeds, vehicle classifications, queue lengths, control delays, and other traffic parameters. These parameters can be obtained through detecting and tracking vehicles based on their features or profiles. Another popular approach to obtain these parameters is called “image subtraction” and subtracts background image from current image to detect objects moving across a constant scene. The constant scene is referred to as the background, which contains merely static objects (e.g. road pavement, roadside buildings, etc.) and clear from moving vehicles or pedestrians. The another method detect vehicles by directly comparing the three color values a frame in a traffic video stream without a single moving vehicle or pedestrian on a busy urban road. (measures of red, green, and blue). To get the background image of a scene, we need to use video image processing to extract the background information from a series of traffic images, because it is nearly impossible to find. There are several ways to extract background images from traffic video streams.

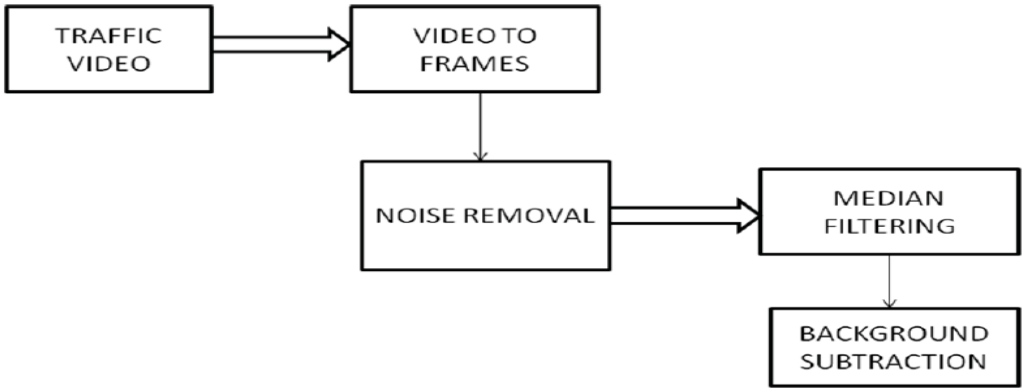

Figure 1. Block Diagram for Nighttime

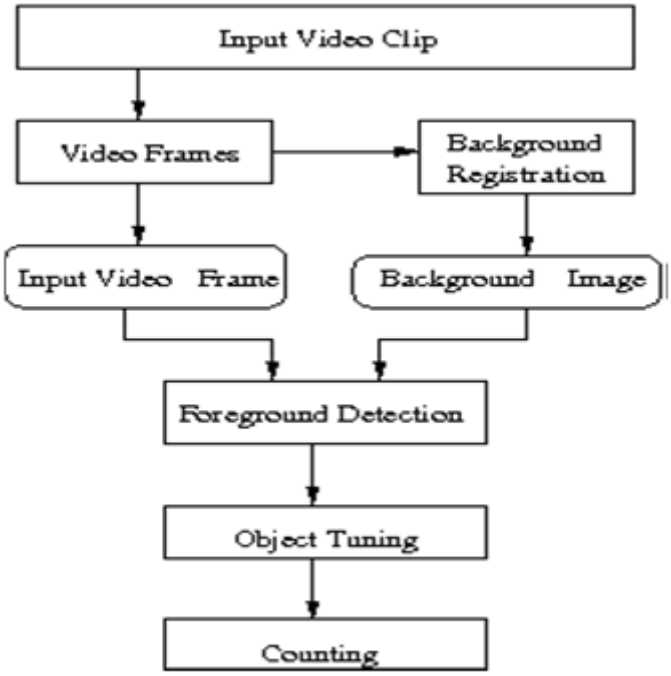

Figure 2. Block Diagram for Daytime

II. PROPOSED ALGORITHM FOR NIGHTTIME AND DAYTIME VEHICLE DETECTION

A. Feature Extraction-

This feature extraction framework is introduced in order to remove unnecessary frequency parts as the occasion demands for face recognition. Three types of Fourier feature domain, concatenated real and imaginary components, Fourier spectrums, and the phase angle, are represented. Three different frequency bandwidths are also designed to extract more complementary frequency features.

B. Background Subtraction-

Background subtraction is a commonly used class of techniques for segmenting out objects of interest in a scene for applications such as surveillance. It involves comparing an observed image with an estimate of the image if it contained no objects of interest. The areas of the image plane where there is a significant difference between the observed and estimated images indicate the location of the objects of interest. The name "background subtraction" comes from the simple technique of subtracting the observed image from the estimated image and thresholding the result to generate the objects of interest. This paper surveys several techniques which are representative of this class, and compares three important attributes of them: how the object areas are distinguished from the background; how the background is maintained over time; and, how the segmented object areas are postprocessed to reject false positives, etc.

C. GMM(Gaussian Mixture Models) –

A Gaussian Mixture Model (GMM) is a parametric probability density function represented as a weighted sum of Gaussian component densities. GMMs are commonly used as a parametricmodel of the probability distribution of continuousmeasurements or features in a biometric system, such as vocal-tract related spectral features in a speaker recognition system. GMM parameters are estimated from training data using the iterative Expectation-Maximization (EM) algorithm or Maximum *A Posteriori* (MAP) estimation from a well-trained prior model.

III. Experiment and Result

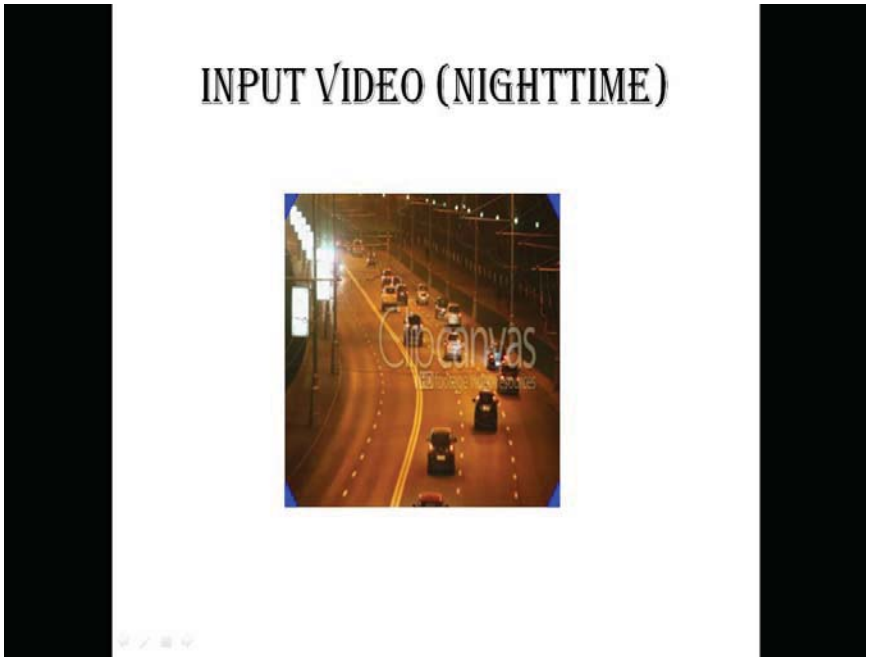

Figure 1 Input video

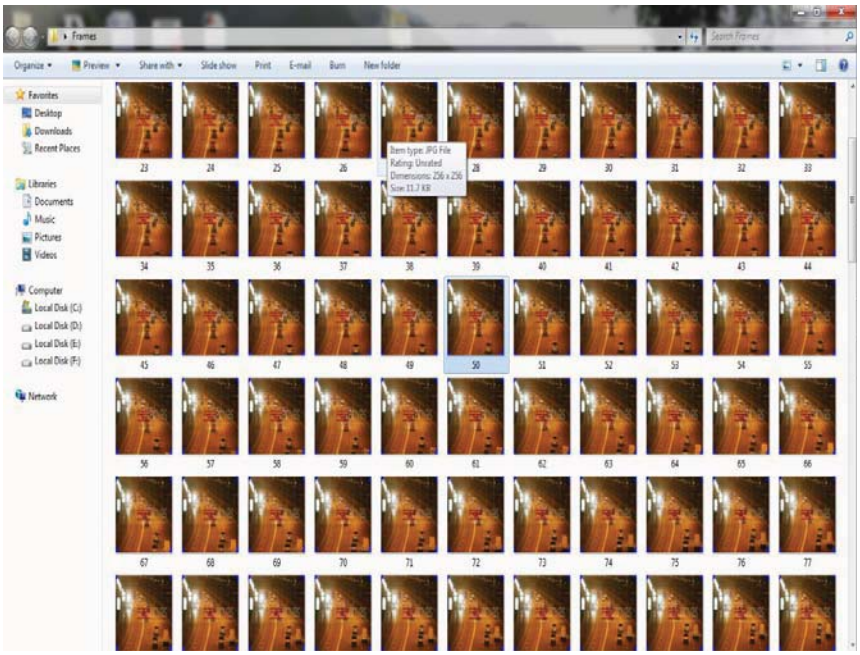

Figure 2 Video to Frames

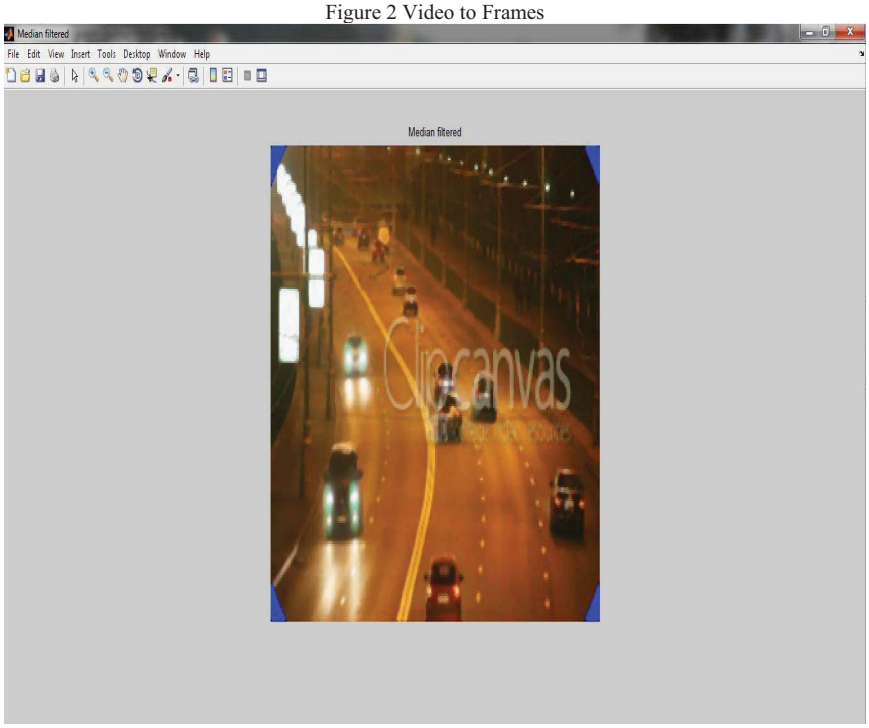

Figure 3 Median filterd output

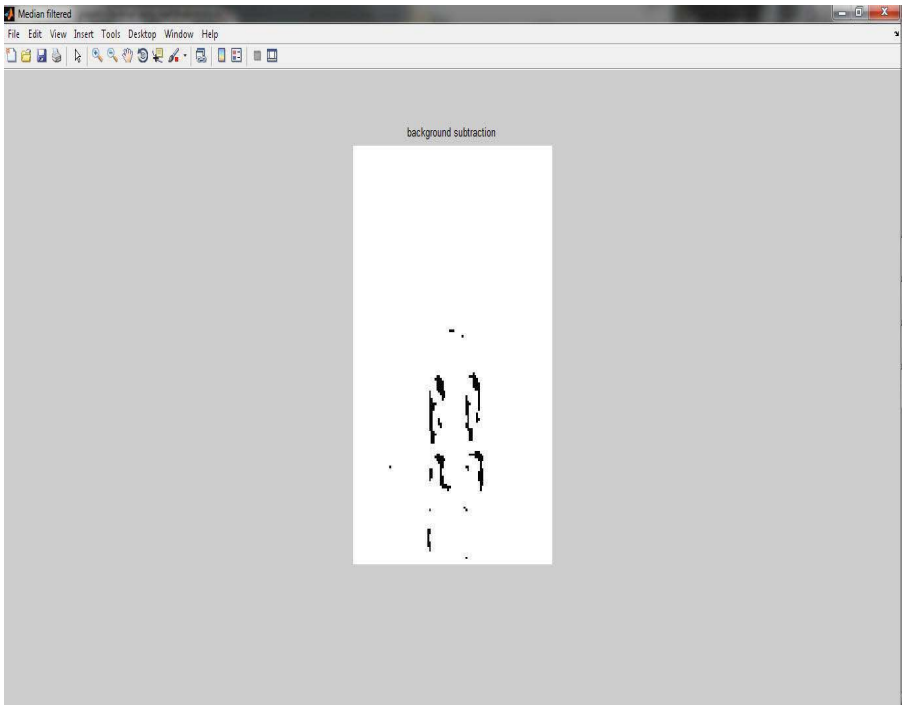

Figure 4 Backgroud subtraction output

IV.CONCLUSION

This section describes the implementation of the proposed vehicle detection. We have presented real–time vehicle detection at nighttime, fulfilling the requirements for an intelligent headlight detection as well as without restricting the incorporation of additional driver assistance applications. The main challenge is to discern between image spots actually due to vehicle lights and those coming from reflections in different infrastructure elements. It could react from one single frame for targets that are clear vehicle lights, or from only a few frames for targets whose type is more difficult to discern most often because they are small dim spots. It is characterized by a number of features that are unique to this proposed method.

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