INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

(Volume2, Issue3)

Available online at: www.Ijariit.com

TRAFFIC JAM AND ACCIDENT DETECTION TECHNIQUES

Raveena Shaili, M.Tech (ECE), raveenashaili92@gmail.com
Sunil Pathania, Assistant Professor (ECE), sunilpathania@shooliniuniversity.com
Shoolini University, Solan (H.P)

Abstract: ***Traffic Jam is a crucial problem which is arising day by day in the whole world to overcome this problem many sensors or many algorithms have been developed for the detection of traffic jam. These sensors and algorithm played an important role in Traffic Jam Detection in every region in terms of accuracy, time of detection, signal management. This paper presents a review to the various algorithms proposed in the past.***

Keywords: ***Traffic jam, image processing, controlling system.***

I. Introduction:

The requirement of a reliable and robust traffic shaping and surveillance system is arising with the rapid increase in number of vehicles due to rising urbanization and population. For effective traffic management real-time analysis and measurement of various parameters such as volume, speed and queue is required. Recent technical developments have depicted that, real-time videos, loop detectors, magnetic sensors, and inductive loop sensors are some promising approaches to detect and analyze various traffic parameters [7]. The ultimate goal of these intelligent techniques is to measure the traffic density on either side of roads and control the traffic lights accordingly [8]. Automatic controlling system for traffic management becomes more important due to the drawbacks of manual traffic controlling systems, such as manual traffic management needs a large amount of man-power [5]. Most of the intelligent traffic management techniques react in the following manner [2].

- Distinguish the absence and presence of vehicles on road to calculate the traffic density on road.
- Make the traffic signal to go red if the road is empty.
- Make the traffic signal to go green if there is traffic on road.
- Duration of green traffic signal depends on traffic density. If traffic density high, then duration will be large, and if density is low, then will be small.

As discussed earlier thesignal should change according to density of traffic on the road. Following pictures show Traffic Jam on the road which needs to be solved.

(a)

(b)

Figure 1 (a) Low Density Road, (b) Vehicle density.

The different computer based traffic jam detection techniques can be classified in two categories: 1) sophisticatedacademic approaches, and 2) commercial solutions.

II. Literature Survey:

Luis Unzueta [1] proposed a traffic management technique which is a combination of both sophisticated and commercial approaches. The proposed technique is a robust vision based system which works in real time and can even work in challenging situations like a rainy day by using standard camera. They proposed a robust adaptive multicue segmentation technique that detects foreground pixels in correspondence to the moving and stopped vehicles. The approach thresholds a combination of luminance and chromaticity disparity maps between the learned background and the current frame. Extra features, which are derived from gradient differences, are then added to improve the segmentation of dark vehicles with casted shadows, and eliminate the reflections of headlights on the road.

VismayPandit [2] proposed a technique which uses image processing to control traffic lights. The system use images rather than electronic sensors to detect vehicles. A camera is installed along with the traffic lights to capture image sequences.Setting image of an empty road as reference, the captured image sequence is matched using image matching. For this, edge detection has been done using Prewitt edge detection operator.

Dharani.S.J [3] suggested an algorithm that determines the traffic density only on the targeted area for traffic management. The given algorithm for traffic flow control works by comparing the reference image with the vehicles captured only in the region of interest. In order tointelligently control the traffic signal the measured vehicle density can be compared with other direction of the traffic.

Nidhi D. Agrawal [4] gave an intelligent traffic controller which can work in heavy congestion also in which some other detectors may not work. This technique is based on real time image processing. Image processing can helps in proper management of traffic even in shadows and in lighting conditions also. Moreover, sensors, cameras are cheaper than for other solutions, so it is also a cost effective

solution. The information obtained by cameras can be used for the development of user handy android applications, which helps in detecting number of vehicles, and depending on the results obtained, the desired and more convenient path can be chosen.

Chandrasekhar. M [5] has simulated to a system which uses image processing algorithm in real time which can efficiently manage traffic lights. In this technique a camera is placed at everystage of traffic light that captures the still images of the road. Then these captured images are successively matchedusing image matching with a reference image which is an empty road image. According to percentage of matching, traffic lights can be controlled.

N.R.Vikram [6] implemented an intelligent traffic lights controller using real time image processing by developing self-adaptive system. Feature detection is an important characteristic of image processing and is used in many image processing applications such as pattern recognition, object recognition, medical imageprocessing etc. The image sequences from a camera are analyzed using 2D edge detection and object counting methods to obtain the most efficient technique. By using the gathered information the development of an android application can be done, by which the user can measure the traffic density at a particular location of choice. In his proposed system, cameras are fixed on tolls or on some tall structured buildings in order to capture the images of vehicles that are passing in through that signal so as to identify the traffic density in that particular position. The videos are viewed for every three minutes for updating the trafficdensity to the user through an android application.

NaeemAbbas [7] proposed an image processing based technique which detects the traffic density. Firstly, theprocessing of the video signal and image acquisition from fixed camera. Secondly, the target area is selected where the vehicles could be present by using image cropping technique. In the third part of algorithm, object detection is done by enhancing features of the image. Finally, the density counting is done, in which the number of vehicles are being counted. The proposed technique is a cost efficient solution as it does not requirethe use of aerial imagery or complex sensor based systems.

V Praveena [8] proposed an approach to detect the accident on the roads and the rescue using ABEONA algorithm. In this approach he discussed the parameters which help to detect the accident and to rescue from region R like: vibration sensor, crash sensor. When the accident has been taken place then it has to broadcast a message to other vehicles near it to inform about accident. The message is transmitted very fast using VANET (vehicular ad-hoc network). They proposed ABEONA algorithm to reach as soon as at the spot. First, the accident is detected by crash sensor, and then VANET is used to transmit the message of accident. ABEONA helps to detect traffic congestion on every road to help the victim to reach to hospital as soon as possible via road id1, road id2, and road id3.

ModugulaRavikanth Reddy [9] suggested an approach in which accident can be detected easily. He used tilt angle to detect the accident but to calculate the tilt angle he needed the accelerometer sensor. It calculates the tilt angle of the vehicle with respect to the road and depending on the tilt angle it can easily detect the accident. After accident detection it has to send a message to the system to inform about accident.

Pradip Singh Maharjan [10] gave an issue solving problem named automatic vehicaldetection and road traffic congestion mapping with image processing. They made theirproposal 93.75% accurate approximately which was analysed on Bhadrakali (Nepal). That detected 257 vehicles out of 275 vehicles.

Yong-KulKi [11] suggested a vision-activated accident detection system. To evaluate the performance of the proposed model in a real world environment, we developed the ARRS. The ARRSs were installed at two intersections in Seoul, South Korea. The data from the DVRs were used to match each crash report to an AMP of ARRS. Information such as the description of the crash, colours of the vehicles involved, and type of crash was used. Duringtest period, a total of 4 traffic accidents were detected and recorded by the AARSs.

III. Conclusion:

As we discussed all the techniques above we can see that traffic Jam detection is classified in two category and these two categories helps us to detect jam on the road. It is very easy with the help of the image taken from the camera or mobile phone. Sometimes the picture quality is low due to misfocus of camera or weather.

IV Acknowledgement

I am very thankful to my guide Sunil Pathania, who encouraged me to take this challenge and helped me to overcome my every problem during this review of techniques to complete my research in this topic. I am grateful to our department's HOD sir and my university.

References:

[1] Luis Unzueta, Marcos Nieto, Andoni Cortés, Javier Barandiaran, OihanaOtaegui, Pedro Sánchez, "Adaptive Multicue Background Subtraction forRobust Vehicle Counting and Classification", *IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, VOL. 13, NO. 2, JUNE 2012*

[2] VismayPandit, JineshDoshi, Dhruv Mehta, AshayMhatre, AbhilashJanardhan, "Smart Traffic Control System Using ImageProcessing", *International Journal of Emerging Trends & Technology in Computer Science, Volume 3, Issue 1, January – February 2014*

[3] Dharani.S.J, Anitha.V, "Traffic Density Count by Optical Flow Algorithmusing Image Processing", *International Journal of Innovative Research in Science, Engineering and Technology, Volume3, Special Issue 2, April 2014*

[4] Nidhi D. Agrawal, AmitSahu, "Intelligent Real Time Traffic ControllerUsing Image Processing – A Survey", International Journal of Science and Research (IJSR) Volume 4 Issue 4, April 2015
ss
[5] Chandrasekhar. M, Saikrishna. C, Chakradhar. B, Phaneendra Kumar. P, Sasanka. C, "Traffic Control Using Digital Image Processing", International Journal of Advanced Electrical and Electronics Engineering, (IJAEEE), Volume-2, Issue-5, 2013

[6] N.R.Vikram, S.Sivaraman, R.Balamurugan, "Controlling Traffic Jam using Feature Detection and ObjectDetection Technique", *IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE)*

[7] NaeemAbbas, Muhammad Tayyab, M.TahirQadri, "Real Time Traffic Density Count using Image Processing", *International Journal of Computer Applications (0975 – 8887),Volume 83 – No 9, December 2013*

[8] V Praveena, Adithtya Ram Shankar, S Jeyabalaji and V Srivatsan, "EFFICIENT ACCIDENT DETECTION AND RESCUE SYSTEM USING ABEONA ALGORITHM". *IJETTCS, ISSN 2278-6856, Volume 3, Issue 5, September-October 2014.*

[9] ModugulaRavikanth Reddy , J.Tulasi, "ACCIDENT DETECTION DEPENDING ON THE VEHICLE POSITION AND VEHICLE THEFT TRACKING, REPORTING SYSTEMS", *International Journal of Science, Engineering and Technology Research, Volume 3, Issue 9, September 2014.*

[10] Pradip Singh Maharajan and Ajay kumarShrestha , "Automatic Vehicle and RoadTraffic congestion mapping with Image processing Technique", International Journal ofComputer Application (0975-8887) , Volume 114-No.16, March 2015

[11]Yong-KulKi,"Accident Detection system using Image processing andMDR",International Journal of computer science and Network Security,Vol.7 No.3,March2007

