Novel Technique to Detect Over Speeding Vehicles

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Abstract: *Now-a-days we hear news about accidents on highways very frequently. And in most of the cases main reason of accident is over-speed. So in order to avoid such kinds of accidents there should be some system which properly checks over-speeding of vehicles. Current techniques use camera image processing and it leads to people being aware of it and reduce speed there. In our novel technique an approach is used to counter it. We have used two sensors in this project. These sensors detect the vehicle speed. Condition is that, the two sensors should be installed at a certain distance apart.*

Keywords: *speed detection; RFID; sensor; over speed*

I. Introduction

While driving on highways, motorists should not exceed the maximum speed limit permitted for their vehicle. However, accidents keep occurring due to speed violation since the drivers tend to ignore their speedometers. Although all highways do have signboards indicating maximum speed limit for the sake of driver's safety, but still people does not obey highway speed limit. To ensure that we continue to reduce the number of accidents it is vital that traffic laws are enforced properly. To ensure decline in accidents and to improve road safety, speed control techniques have to be implemented in highways, school and college zones. The existing techniques are somewhat inefficient as it makes use of camera image processing which results in people being aware of the position where it is placed and reducing speed only at that point. Here we are presenting a novel idea which makes sure that vehicle maintains a constant speed within the speed limit over a particular area. .The proposed system will check on rash driving by calculating the speed of a vehicle using the time taken to travel between the two set points. The aim of this project is to develop a device to detect rash driving on highways and to alert the traffic authorities in case of any speed violation. Accidents due to rash driving on highways are on the rise and people are losing their lives because of others mistakes

This can be avoided by implementing this novel speed control technique in highways, school and college zones. In this paper we discuss about the current trends in speed detection and the inabilities of existing system. Here we explain how a speed control technique based on time taken can be implemented effectively in existing traffic system. A brief literature review is presented which is followed by conclusion.

II. Overview Of Some Relevant Works

There are lot of methods to detect over speed. In the present conventional system, handheld radar gun is used to detect and record a vehicle's speed and it is an ineffective

method. The other	existing methods are given below.		
A. RF-based vehicle detection and speed estimation			
Developing	a	robust	and	reliable
Vehicle detection and speed estimation		system that	alerts

drivers about driving conditions and helps them avoid joining traffic jams is an important problem that has attracted lots of attention recently. This system leverages the fact that the presence of objects in an RF environment affects the received signal strength and hence, can be used to detect and identify different characteristics of the objects in an area of interest [1]. Its long-term vision is to leverage common wireless networks, such as Wi-Fi or cellular, to detect the density of traffic and estimate the car speed based on the mobile devices carried by users. Speed estimation techniques are based on statistical and curve fitting approaches. This can detect vehicle motion with an accuracy of 100% and estimate the vehicle speed with an accuracy of 90% in typical streets. This highlights the

feasibility and promise of using RF for vehicle detection and speed estimation.

B. Vehicle speed detection system

This intends to develop the vehicle speed detection system using image processing technique. [3]Overall works are the software development of a system that requires a video scene, which consists of the following components: moving vehicle, starting reference point and ending reference point. The system is designed to detect the position of the moving vehicle in the scene and the position of the reference points and calculate the speed of each static image frame from the detected positions. The vehicle speed detection from a video frame system consists of six major components: 1) Image Acquisition, for collecting a series of single images from the video scene and storing them in the temporary storage. 2) Image Enhancement, to improve some characteristics of the single image in order to provide more accuracy and better future performance. 3) Image Segmentation, to perform the vehicle position detection using image differentiation. 4) Image Analysis, to analyse the position of the reference starting point and the reference ending point, using a threshold technique. 5) Speed Detection, to calculate the speed of each vehicle in the single image frame using the detection vehicle position and the reference point positions, and 6) Report, to convey the information to the end user as readable information. The experimentation has been made in order to assess three qualities: 1) Usability, to prove that the system can determine vehicle speed under the specific conditions laid out. 2) Performance, and 3) Effectiveness. The results show that the system works with highest performance at resolution 320×240. It takes around 70 seconds to detect a moving vehicle in a video scene.

C. Moving detection technology for vehicle speed based on pseudorandom code phase modulation

This is a moving detection technology for vehicle speed based on pseudorandom code phase modulation [4]. Under the conidian of moving detector, the echo signals of the detected vehicles were obtained from Doppler shift, the echo signals relationship between the vehicle speed and distance were obtained. Experiments show that the method to achieve the moving vehicle speed has good real-time and high precision.

D. Automatic vehicle speed detection using video camera

This is a method based on digital image processing to realize the real-time automatic vehicle speed monitoring using video camera [2]. Based on geometric optics, it first presents a simplified method to accurately map the coordinates in image domain into real-world domain. The second part is focused on the vehicle detection in digital image frames in video stream. Experiment shows it requires only a single digital video camera and an on-board computer and can simultaneously monitor vehicular speeds in multiple lanes. The detected vehicle speed has an average error which is below 4%.

III. Over Speed Detection System

This project is to develop a device that detects over speeding of vehicle on highways and informs traffic authorities in case of any speed limit violation. The proposed system checks an over speeding vehicle or rash driving by calculating the speed of the passing vehicle using the time taken to travel between two check points (at a fixed distance)installed on either side of the road at a fixed distance. The system basically comprises two RF readers, which are installed on the highway some distance apart. RFID tags are embedded on vehicle body. When vehicle crosses the first point its tag is read by RFID and it passes information to pic microcontroller. The speed limit is set by the person who uses the system depending upon the traffic at the very location. The time taken by the vehicle to travel from one set point to the other is calculated by a microcontroller program from which the speed of the vehicle can be calculated as follows: Speed (kmph) = Distance/Time. If the vehicle exceeds the speed limit, then fine is imposed.

A timer is started inside the microcontroller whenever a low pulse is received on the first sensor. Then microcontroller waits for pulse from second sensor. Timer is stopped whenever low pulse is received on second receiver.This concept can be extended in future by integrating a camera with the system that will capture the image of the number plate of the vehicle and send it to the traffic authorities.

IV. Conclusion

India is a country where maximum number of deaths occur due to road accidents and most of these occur due to over speeding. Many efforts have been made to yield consistent and well-organized means of identifying over speeding. All the existing methods are somewhat inefficient. The necessities for a more reliable and easily operable device made us introduce this idea. Since it is based on RFID we can get all the information regarding the vehicle and hence tracking becomes easier. There is also an added advantage that it can be set up on any road and is easily transferable.

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