Speed Detection and Number Plate Recognition Using RFID Technology

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Abstract

With the expansion in vehicles use, the roadway traffic have just flooded. At the present pace of expanding automobiles, speed detection has become a significant worry in maintaining a strategic distance from deadly adversity. Our paper is tied in with recovering all the insights about the vehicle and its proprietor by utilizing RFID technology. Every vehicle would have a RFID label that is encoded with the name of the proprietor, contact number, vehicle registration details and furthermore about protection subtleties. RFID readers must be installed at specific distance dependent on the scope of the reader utilized. Speed estimating sensors are additionally introduced along the RF readers. In the event that the sensor identifies that the vehicle crosses the predefined speed limit, the details are sent to the traffic police control space for additional methods. On the off chance that a vehicle is discovered missing, the police can view the records and afterward find the zone at which the vehicle is crossing.

Keywords: Radio Frequency Identification (RFID), Speed Sensors, RFID Readers, RFID TAGS.

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I. INTRODUCTION

Roadway traffic control has been a difficult problem for the administration on a worldwide scale. As indicated by reports, an aggregate of around 1.3 million accidents happen everywhere throughout the world every year; a larger part of them brought about by the vehicle which crosses the minimum speed[10]. It will be difficult to give adequate physical work to control traffic at all the bustling zones if the on-street vehicles keep expanding at the current rate.
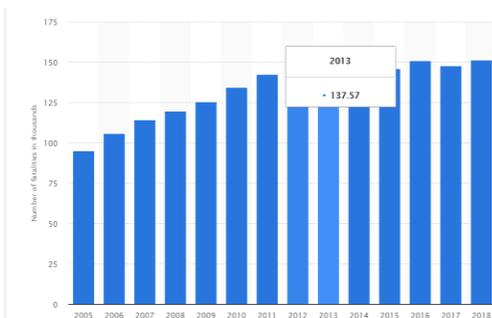

Figure 1: Statistical report of accidents on road

Doppler shift mechanism is used by radar gun; radio waves are made to fall on the object of which speed is to be resolved and the recurrence of the reflected radio waves differs relying upon the rate at which the vehicle is moving.[1] This adjustment in recurrence of reflected waves can be utilized to figure out how fast the vehicle is traveling. In spite of the fact that radar innovation is found to be giving promising outcomes, but there are several drawbacks: speed of just one moving vehicle can be found at one particular time. While being used, if there are any gadgets that produce radio waves in the close to region, the outcomes are affected. Incredibly costly. Radar guns must be pointed towards the immediate way of the approaching traffic. All these research drove the specialists to search for another option that is better as far as both execution and cost. Image and video handling has demonstrated to give increasingly dependable outcomes with lesser expenses and endeavors.

Image processing[3] is being utilized from the previous decade for Speed recognition for vehicle, classification, checking and some more. Some paper shows how we can utilize simple web cameras connected to the computer can recognize the speed of vehicles.

The principle motive behind this paper is to acquire the details of a vehicle effectively just by utilizing a reader. The other reason is to guide people to the traffic controls appropriately which would reduce the road accidents by utilizing RF technology. The base thought behind usage of RFID System is to computerize the cost assortment process and their by decreasing manual activity on roads of implementing traffic police. In expansion to which we can not just assistance the vehicle owner and framework administrators from vehicle burglary location yet in addition can track over speeding vehicles, and signal crossing.[5]

Paper is organized as follows. Section II deals with the related work Section III explains about existing system Section IV is about Proposed System V deals with Result Analysis VI concludes the paper VII includes the future works.

II. RELATED WORK

A framework for Position Based High Speed Vehicle Detection Algorithm (PHVA) for identifying the higher speed vehicles in a Vehicular Ad Hoc Network (VANET) by utilizing a vehicular cloud server, where the cloud server is utilized for the service is proposed.[1]Another approach where it manages the subject of discovery of vehicle speed dependent on data from video record. In hypothetical part it portrays the most significant strategies, to be

specific Gaussian mixture models, DBSCAN, Kalman filter, Optical flow.[2] The paper introduced a vehicle speed estimation algorithm dependent on moving object detection in video. Initially, the moving vehicles were extracted by utilizing the three frame difference strategy and the background difference method ; furthermore, followed and situated the moving objective as indicated by moving vehicle centroid technique; at last, the vehicle speed was found based on mapping relationship between the pixel distance with the actual distance.[3] Automatic Number plate recognition is utilized to find area of the number plate. These methodologies and strategies differ dependent on conditions like, picture quality, vehicle at fixed positions, states of lights, single picture and so on. Likewise it should have the option to adapt to the varieties in licence plates from various countries and states. The methodology have the option to work flawlessly with number of characters changing in plates or size of the plates in the caught pictures. It mostly discovery and acknowledgment of various vehicles number plate from one frame only. Proposed framework comprises of two stages: plate number detection and recognition.[4] A considerable lot of the existing research investigations on VNPR frameworks depended on mix of edge investigation and morphology tasks and got promising outcomes.[5]

In certain examinations, the strategy using Hough transform isn't appropriate in circumstance when plate borders are not satisfactory because of damages or soil. This technique too experiences high computational complexity.[6]

A few examinations[11] utilized colour-based features for number plate detection.. Be that as it may, weakness of this component to the color of vehicle has confined its use. So as to improve the presentation of the framework, mix of various strategies, for example, blend of color, surface has been reported in different examinations [1], [9] with VNPR framework.

Another paper proposes an effective method to detect the passive tag's velocity. When a tag is moving, the energy distribution between received baseband signal I and Q changes over time as a result of both the Doppler Effect and the change of distance between reader and tag. Without any modification of the antenna, only one conventional reader was used to detect the change of distribution to calculate the velocity[8].

III. EXSISTING SYSTEM

The current framework to identify the details of a vehicle is by entering the registration number of it in the particular site[7]. In the event that the vehicle goes without complying with the red light traffic light, at that point that vehicle is identified by the utilization of red light cameras. Other existing framework to discover over speeding of vehicles is by the use of two kinds of cameras. One is fixed camera and the other is versatile one[2]. The camera transmits a beam toward entry of vehicles instreet. The frequency of beam gets shifted as the vehicle passes and the speed is estimated. On the off chance that the speed is seen to be more prominent than the predefined speed limit, the cameras catches the image of the vehicle.

The caught pictures are sent for secondary check by the cops who have the sole option to record the case or reject the ticket.
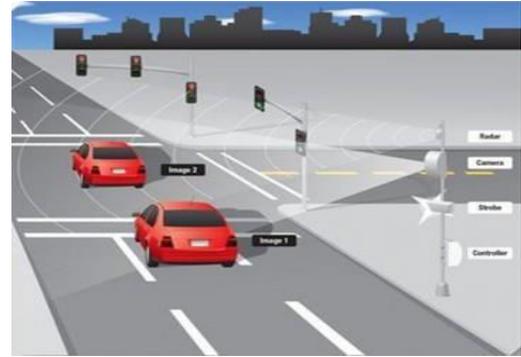
Figure 2 : Red light with speed camera

IV. PROPOSED SYSTEM

RFID readers[1] are to be introduced in the recently produced vehicles with unique IDs. At the point when the vehicle is taken for registration, all the details along the tag number is gathered by the government and entered into database. RFID readers and speed detectors are put on the side of the road. As the vehicle passes the speed is estimated and on the off chance that it exceeds the indicated limit the reader is made to record the details of that particular vehicle. The readers can be connected using local area network or wireless network.

We have utilized the Infra-Red sensors for the speed estimation. EM-18 Reader is utilized with Arduino UNO. PC or PCs can be utilized for displaying and a buzzer is used for alarm to indicate over speeding vehicle.
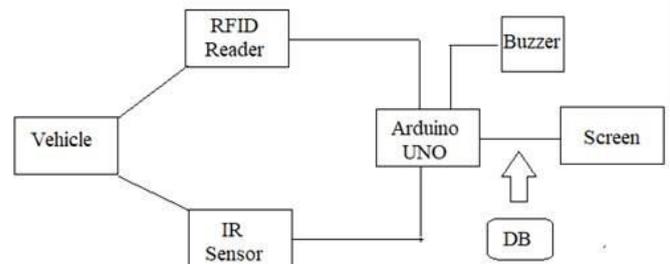

Figure 3 : Block Diagram

1.Arduino platform for atmega 328

A single board microcontroller Arduino, planned to make the utilization of intuitive items or situations increasingly open. An open-source hardware board is compressed in a hardware, 8-bit Atmel AVR microcontroller is designed, or a 32-bit Atmel ARM. Present models include a USB interface, 6 input analog pins, just as fourteen digitalised input and output pins which permit the client to connect different additional boards. It accompanies a simple IDE.
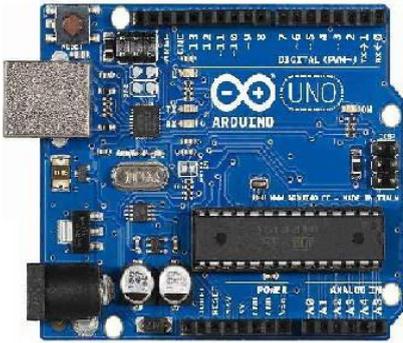
Figure 4 : Arduino UNO

2. IR Sensors

A light weight sensor IR or also known as Infrared sensor, that is used to detect a parts of the surrounding environmental factors. An IR sensor can measure the heat of an object as recognizes the motion. These kinds of sensors measures just infrared radiation, instead of manufacturing it that is called as an IR sensor Passive.

3. EM-18 RFID reader

One of the organization utilized RFID reader to peruse 125 kHz tags is EM-18 RFID reader. It includes minimal effort, low power utilization, and easy to use. Output is given to both UART and Wiegand26. It tends to be straightforwardly interfaced with microcontroller utilizing UART and with PC utilizing a RS232 converter.

4. RFID Tags

RFID Tags[1] are little objects that contain a chip and are for remote recognizable proof of the items they are appended with the assistance of a RFID reader. Dissimilar to barcode, RFID labels don't require view from the tag to the reader and read/write functionality. Most RFID tags are passive, which implies they work maintenance free, without battery power, for a long time. The details stored for the tag are Registration number, Date of registration, Owner, Address etc.

V. RESULT ANALYSIS

The RFID Tags are swiped over the reader and the outcome is acquired. It is found out from the outcome that the details stored for that tag is shown on the screen as appeared as the vehicle passes. In the event that the speed of the vehicle is to be determined, it must be distinguished and contrasted with the threshold speed .If the vehicle over speeds then buzzer gets activated and raise an alarm. In the event if speed is more than the threshold limit, the details can be sent to the traffic experts for additional procedures.

VI . CONCLUSION

This paper proposes a framework where the vehicle details are recovery based on the RFID technology. It has the delays that frequently happen on streets. The above model can be introduced in vehicles which will have all the details of the vehicle owner and the readers can be introduced at the street side at every single road where speed limit must be kept up.

VII. FUTURE WORKS

A CCTV Camera can be set on the highway. In the event that any vehicle has crossed the most extreme speed limit, at that point this camera will be triggered to snap a photo of the vehicle. We can include voice declaration framework. It will hint the driver that he/she has traversed speed condition. We disclosed how to dependably, cost-adequately, safely, distinguish vehicles at can use the GSM innovation. So that the closest highway security officers will be intimated about the vehicle which has over speed.

VIII. REFERENCES

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