

SPEED CHECK AND OVERSPEED DETECTOR

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Abstract – The advancements in various technologies have prioritized the use of automation over manhandled machines. Since most of the systems like machinery, factories, switching on telephone networks etc. are getting automated; the traffic monitoring system should also be automatic. Presently, there is radar gun used or LIDARs for over speed detection but it requires a person to pull the trigger to determine its speed. As we know that over speeding is one of the major causes for accidents, there is a need to acknowledge the importance of a strict speed limit enforcement system which does not require to be handled manually; The Speed Check and Over speed Detector is one of the required systems. This can also be implemented in school campuses, college campuses and other buildings. It detects the presence of over speeding vehicle and captures its image (image of the number plate) and sends it to drop box using cloud computing or as a mail to authority server.

Keywords - Automated Overspeed detection, cloud computing, smart traffic monitoring, Automation, RF tech, IOT.

1. INTRODUCTION

We all know that speeding or rather over speeding is one of the major causes for accidents. In this busy life This is a prototype of a system which uses a technology that focuses on calculating the speed of approaching vehicle and also captures the image of the vehicle that over speeds. The project contains various electronic components like microcontroller, camera, distance sensor display board etc.

2. METHODOLOGY

The process starts with the ultrasonic sensor used to sense the approaching vehicle on road. The distance sensor that is ultrasonic sensor (named as radar gun in block diagram below) gets triggered when an object is present under its range. This sensor is used to find the range of any object. The ultrasonic waves from the sensor reflect back from the target object and using the

scenario, people don't prefer to drive at normal speed rather than departing early from their respective places to reach on time. Thus, there is a need to understand the importance of a technology which would function as a speed limit enforcement system. A system which would help to keep vehicles at normal speed and the owner of the over speeding vehicle would be punished under law, as law is one of the best ways for making people to create a habit of driving at normal designated speeds.

In some places, traffic policemen are present to monitor the normal functioning of traffic on roads and at other places radar system is implemented which is a technology based on the Doppler Effect and determines the speed of the moving object with just one trigger. The whole system whether it's radar or any other is manual and requires a man to take charge of watching the vehicles passing by and to report if any vehicle over speeds or breaks the law.

In any system, the advancements in technology used prioritize the automation over manhandled machines. So, the traffic monitoring system should also be automatic which is possible in many ways.

An idea of one of such system is presented by this paper. The project so developed keeping in view all the things mentioned above is named as Speed Check and over speed Detector.

speed of sound and the time it takes to reach the object (time taken to receive echo/2) determines the range of the object. Here, the trigger signal is recorded at specified time interval (at two different time intervals) for every moving object detected. The difference of the distances recorded is divided by the difference of the time at which both the trigger signals are received. This gives the speed of the moving object.

The processing for the calculations takes place in the controller used. The controller further sends the value to the speed recorded to the controller placed near the display board. This is how speed of the target vehicle is displayed on the LED board. In the programming of the arduino board, a speed limit is defined and a condition is given. If the speed calculated is above the predefined limit, a WARNING message is sent to the display which

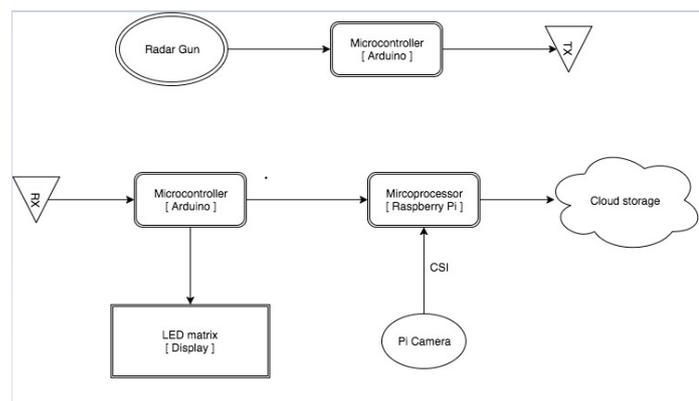
triggers the camera connected to the raspberry pi arduino. The camera immediately captures the image vehicle along with its number plate. The image is sent as a message or mail to a server maintained by the authority person or sent to drop box using cloud computing.

3. HARDWARE USED

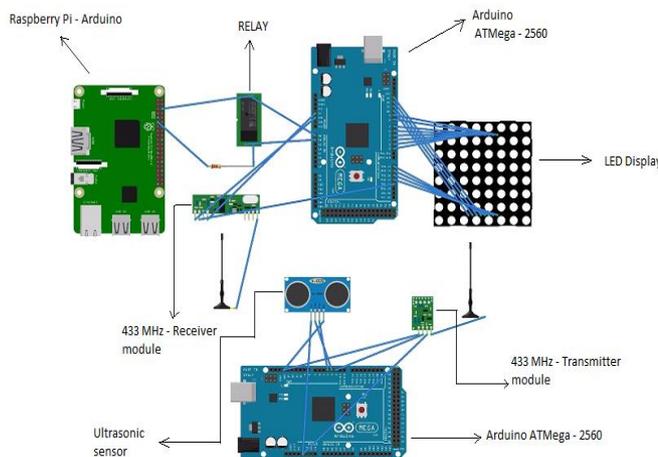
The components used are:

- Arduino AT Mega 2560
- Ultrasonic sensor
- LED Display
- PI Camera
- Raspberry PI – Arduino board
- Trans-receiver – NRF24L01
- SD Card

4. BLOCK DIAGRAM



5. CIRCUIT DIAGRAM



The distance sensor (ultrasonic sensor) has four pins. The echo pin of the sensor and the input to the transmitter (434 MHz Tx-module) are connected to the analog (PWM) I/O Ports and the Tx (transmission) pin of the controller respectively. The LED board connections are made to the I/O pins of the controller ATmega 2560. The receiver pin is connected to the receiver (Rx) port. The camera is connected to the raspberry pi board. This board has an access to Bluetooth and LAN. It further sends the image to the cloud.

5. CONCLUSION

The motive of this paper is to contribute to the advancement in the present traffic monitoring system; a technology that would work as a speed limit enforcement system or simply, a Speed Trap. The system monitors the maintenance of normal speed by the vehicles and does not require being man handled as in radar gun speed monitoring system. Thus, it helps in reducing frequently occurring accidents.

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