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CAR OVER-SPEED DETECTOR PROJECT: ENHANCING ROAD SAFETY THROUGH ADVANCED TECHNOLOGY

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Abstract – Road accidents have been very common in the present world with the prime cause being the careless driving. The necessity to check this has been very essential and different methods have been used so far. However, with the advancement in the technology, different governing bodies are demanding some sort of computerized technology to control this problem of over speed driving. At this scenario, we are proposing a system to detect the vehicle which are being driven above the given maximum speed limit that the respective roads or highway limits. The overall project is divided in four categories; speed detection, processing, displaying warning message and beeping the buzzer.

1. LITERATURE SURVEY:

Vishal Pande et.al has proposed a framework for autonomous speed control of over speeding vehicle using Radio Frequency to design a controller to control vehicles speed and display to monitor the zones which can run on an embedded system platform.

Monika Jain presented a device to detect the rash driving and alerts the traffic authorities in case of any violation. This frame of reference intends to design a system aimed at early detection and alerts vehicles driving patterns which is related to rash driving. The speed limit is by the police at very location who uses the system depending on the traffic. This device reports, displays and data base system for over speed violation management.

Ni Hlaing et.al designed a system that detects the speed of the vehicle in the roads, main highways and the places where the drivers over speed. If the speed exceeds the limit, the information will be sent to PC (Personal Computer) which starts the camera which captures the vehicle of over speed.

Amarnarayan et.al developed speed estimation system that alerts drivers about driving conditions, robust and reliable and helps to avoid joining traffic jams is an important problem that has attracted lots of attention recently.

Nehal Kassem et.al introduced a novel RF based vehicle motion and speed detection system which can detect vehicle motion estimates the vehicle speed in typical streets with an accuracy of 90% and detects motion with an ISJEM sample model format. Define acronyms and acronyms the first spell they are used in the writing, even after they have been well-defined in the abstract. Shortenings such as IEEE, SI, MKS, CGS, SC, DC, and REMS do not have to be demarcated. Do not use condensations in the title or bonces without they are unavoidable.

2. INTRODUCTION:

There are definite rules laid out by authorities about driving cars on roads. The most common rule in any country is speed limit in certain roads i.e. you will be in violation of the law if your car speed exceeds this limit. In order to detect the speed of a moving car, the patrolling officers usually depend on a hand-held gun that works on Radar Technology or LIDAR Technology. This is a tedious process as the officer has to manually check for over speeding for each vehicle. ← What if the Car Speed Detection is made automatic? A simple automatic detection of speed of a vehicle is designed in Arduino Car Speed Detector project, where you can place the system in one place and view the results instantly without any human intervention

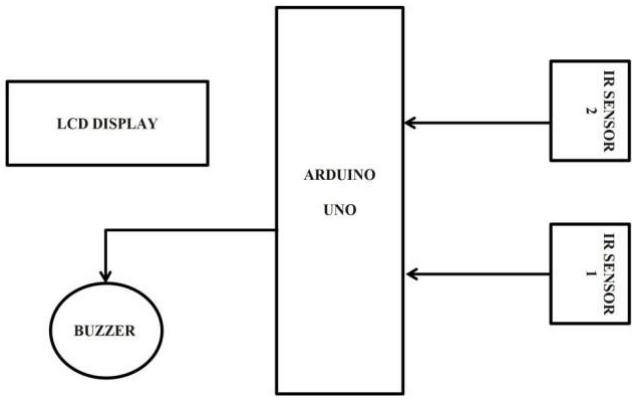

Fig 1: Block Diagram

3. WORKING

The working of the Arduino based car speed detector project is very simple. Arduino continuously reads the inputs from the IR Sensors. When a car moving in front of the setup reaches the first sensor, Arduino becomes alert and capture a time stamp the moment the car leaves the first IR Sensor.
Another time stamp is recorded when the car reaches the second IR Sensor.

Arduino then calculates the velocity by assuming the distance as 5 meters between the two IR Sensor and displays the result in kilometers per hour on the 16×2 LCD Display.
The Arduino then sends the signal to the buzzer connected in the circuit and beeps the buzzer which in turn alerts the operator.

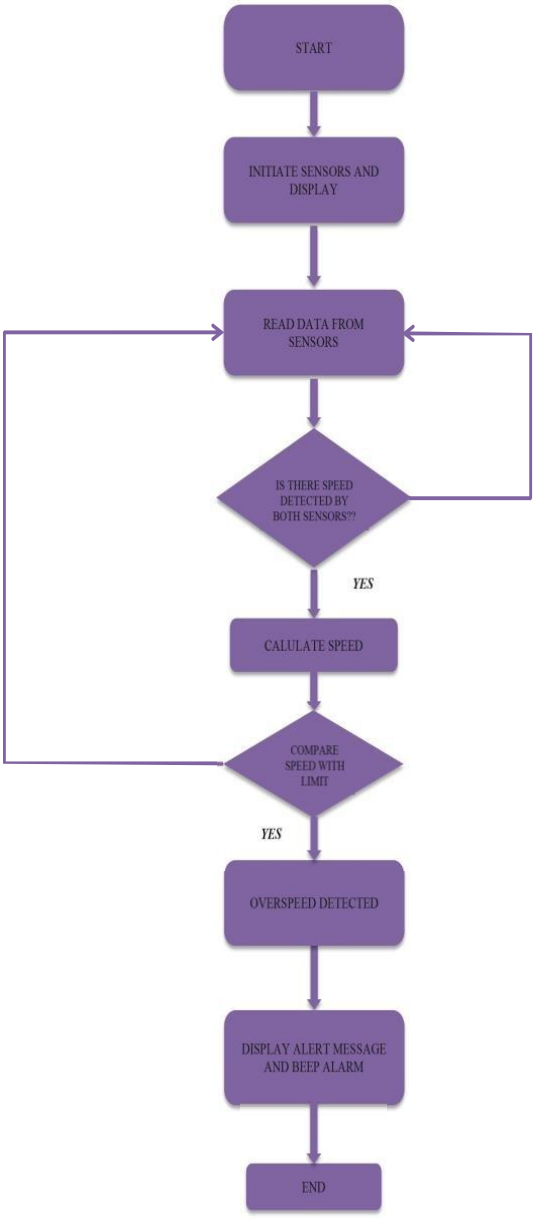

Fig 2: Flow chart

4. CONCLUSIONS

The contributing to the best working unit for "Vehicle speed detection using Arduino and IR sensors" has been designed. The device provides an automated solution to continuously monitor the vehicle speed and display the vehicle speed on the LCD module and the system is able to give the over speed alerts through the buzzer. Thus, the project has been successfully designed and tested. By using this project we can reduce road accidents in future, this system can be extended by integrating a camera which could capture the image of the number plate of the vehicle and send it to the traffic authorities or the corresponding vehicle owner for further legal action.

5. FUTURE SCOPE

The future scope of car over-speed detector project can be quite exciting, potentially expanding beyond just catching speed demons. Here are some interesting areas to explore:

·**Advanced Functionality:**

Integration with Traffic Management Systems: Connect your detector to real-time traffic data. This allows for dynamic speed limit adjustments based on congestion or weather conditions.

AI-powered Vehicle Classification: Use machine learning to categorize vehicles by type (car, truck). This enables enforcement based on specific speed limits for different vehicle classes.

Automatic Ticketing/Notification System: Develop a system that automatically generates speeding tickets or alerts authorities when a violation occurs.

·**Enhancing Safety and Enforcement**:

Driver Alert Systems: Integrate with in-vehicle warning systems to directly notify drivers exceeding the speed limit.

School Zone and Work Zone Safety: Enable automatic speed reductions in designated high-risk areas like school zones or construction areas.

Data Collection and Analysis: Use the collected data to identify accident-prone areas and improve overall traffic flow.

·**Expanding Applications:**

Road Usage Charging: Implement systems for congestion pricing or toll roads based on distance traveled or speed.

Self-Driving Car Integration: Provide data for autonomous vehicles to maintain safe speeds and improve overall traffic management.

Advanced Driver Assistance Systems (ADAS): Contribute to the development of ADAS features like automatic speed control based on road conditions

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