AutomaticVehicle Speed Control System at Accident Prone Areas

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***Abstract* — This design has an aim to manage the speed of any vehicles automatically in urban areas and also at restricted areas such schools, colleges, hospitals and in other speed limited areas etc. Nowadays in a fast-moving world all the people will not have self-control. Such people are driving vehicles at a high speed. So, the traffic police are not able to monitor all these things. This paper provides a solution for how to control the speed without harming others. Driver does not have control anything during such places; controls are taken automatically by the use of electronic system. In this project we are using RF technology for indicating the speed limit areas, it is placed front and back of the restricted zones. RF receiver is placed inside the vehicle. Speed is acquired from speedometer in the vehicle. The controller compares the speed. if it exceeds the limited speed the controller alerts the driver and controls taken automatically and speed of the vehicle is reduced to the restricted speed set by the user. All this process is done automatically.**

Keywords— RF Transmitter and receiver, motor driver, LCD, Arduino Nano.

I. INTRODUCTION

According to recent surveys, Accidents occurred mostly are due to over speeding and are in greater numbers at crowded areas like schools, colleges which might be dangerous to school children. So in order to reduce accidents that occur due to over speeding, we would like to develop a system that continuously monitor the vehicles speeds and restricts vehicle speed to the speed limit set to the respective area.

Previously this process of controlling speed is done using sign boards along the roads and traffic police manually indicating to reduce the speed but this process does not serve the needs to a great extent. So, we thought about using engineering and technological advancements to gain advantages and benefits for the safety of people.

An automatic vehicle speed control at accident prone areas using RF maybe a more helpful option now a days than controlling manually which doesn't work all the time. Continuously monitoring the vehicle speed is difficult task, as speed is completely dependent on the individuals riding the vehicles. Using RF helps in communication between the vehicle and the respective zone.

II. RELATED WORKS

Real Time Embedded System for Accident prevention. [1] (R. GaneshBabu and Dr.V.Amudha 2014). This paper contains autonomous accident prevention with security enabling techniques, speed control and accident detection system and the main objective is to design an Atmega328P controller to monitor the zones which can run on an embedded system and to automatically locate the site of accident and alert the concerned people. It should be done automatically as the person involved in the accident may not be in a situation to send information. The proposed system is composed of two separate design units: transmitter unit and the receiver unit. Just before the vehicle enters the transmitter zone, the vehicle speed is controlled by receiving the signal from the RF transmitter end. For this, RF transmitter can be kept at a few meters in front of the zone. Security system includes alcohol sensor (R. GaneshBabu and Dr.V.Amudha 2015) Design and implementation of automatic headlight dimmer for vehicles using light dependent resistor (ldr) sensor 2016. Headlights pose a great danger during night driving, the drivers of most vehicles use high, bright beam while driving at night, this causes a discomfort

to the drivers travelling from the opposite direction and therefore experiences a sudden stop for a short period of time. [2] P.Aravind, V.Kishore are proposed "E-Vehicle- Automatic Speed Control Using Android Mobile Application" : In the rapidly changing world, the speed has become an important factor in humans. Everyone wants to get fast as much as possible in the fast speed world there are two perspectives, one is maintaining the speed and the other is to maintain the safety. In the speed world the technologies play a crucial role. Smart phones are a major part of the growing technologies in the globe. So, our objective is to ensure maximum safety to the person who is driving the vehicle and to the people on the road in all parameters using a mobile app. [3] Lorate Shiny1, A. Rajakumaran2, S.Vijay proposed "Vehicle Control System with Accident Prevention by Using IR Technology" The project presented here is a step towards vehicle navigation & safety implementation. As the title suggests the project is aimed at automatically sensing the areas like "School zone", "Work zone" or "Curve zone". As an example, near school zone, the sign board shows "School Zone Ahead, Drive Slowly", or near construction site, "Drive slowly, Work under construction". Drivers go at a very high speed usually near school zone or indulge in speeding causes inconvenience to other vehicle users and pedestrians. Even though these are meant for the safety of the vehicles traveling and also for the public, it is not usually practiced and ignored by most of the vehicle drivers. The main objective is to construct a Vehicle controller meant for vehicle's speed control and monitors the zones, which can work on an embedded system. Vehicle Controller can be customized to fit into a vehicle's dashboard and displays information on the vehicle's LCD. The project comprises of two separate units: zone status transmitter unit and receiver (speed display and control) unit. Once the information is retrieved from the zones, the vehicle's embedded unit automatically alerts the driver, to reduce the speed according to the respective zone, it waits for a few seconds, and otherwise vehicles controller unit automatically decreases the speed.

III.DESIGN

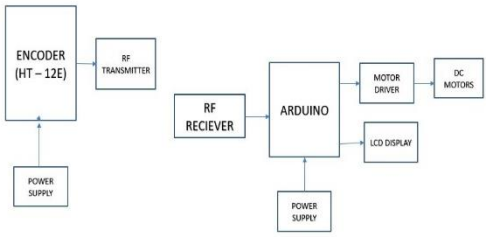


Fig. 1. Block Diagram

The Arduino nano is the microcontroller. When a vehicle exceeds the speed limit that was set in a zone an indication is sent to the driver that he is over speeding and if he doesn't reduce his speed, the speed of vehicle is gradually decreased to the speed limit of the respective area.

A. RF MODULE

RF module has a short-range antenna attached on the transmitter end. It needs battery or a power source in order to be operated, and for long duration it can be used. It is often desired to communicate with other device wirelessly. The range of the antenna attached on the transmitter is small. It can just release signal from RF transmitter. Whenever RF receiver come across the transmitter devices, signal is sent to receiver which is placed in the vehicle.

a. RF TRANSMITTER

It is a small assembly; it can be able to transmit the radio waves with the help of an antenna. This system works along with microcontroller. This is used to give data to the receiver. The TWS-434 extremely small and are excellent for applications requiring short-range RF remote controls. The transmitter module is only 1/3 the size of a standard postage stamp and can easily be placed inside a small plastic enclosure.TWS-434: The transmitter output is up to 8mW at 433.92MHz with a range of Approximately 400 foot (open area) outdoors. Indoors, the range is approximately 200 foot, and will go through most walls. The TWS-434 transmitter accepts both linear and digital inputs can operate from 1.5 to 12 Volts-DC, and makes building a miniature hand-held RF transmitter very Easy. The TWS-434 is approximately 1/3 the size of a standard postage stamp

b. RF RECEIVER

It receives the modulated signal and its job is to demodulate it. Two types of RF receiver modules are

present: super heterodyne receivers and super-regenerative receivers. Super regenerative modules are usually less cost and low power designs using a series of amplifiers to extract modulated data from a carrier wave. Whereas on the other hand, Super-regenerative modules generally imprecise as their frequency of operation varies considerably with temperature and power supply voltage.

B. ARDUINO NANO

A 16Megahertz crystal oscillator is a component of the Arduino Nano. Arduino nano, with constant voltage, a precise clock is created. One constraint of the Arduino Nano is that a battery can't be used to power it because it lacks a dc power port. The Arduino software can be used to program an Arduino nano. Nano board must be selected from tools menu. The Atmel mega328 microcontroller on the nano board comes preprogrammed with a boot loader.

C. LCD DISPLAY

(16*2) size LCD display is used, connected with the Microcontroller, for showing the speed of vehicle and if the speed of vehicle is greater, then the LCD will display the message of over-speeding and the speed will get decreased automatically

D. L293D MOTOR DRIVER

The IC L293D is a dual-channel H-Bridge motor driver capable of driving a pair of DC motors or a single stepper motor. This means IC L293D can drive up to two motors individually which makes it ideal for building a two-wheeled robotic platform. The IC L293D is a 16 pin IC, with eight pins, on each side, dedicated to the controlling of a motor in car. There are 2 INPUT pins, 2 OUTPUT pins and 1 ENABLE pin for every motor. IC L293D consist of two H-bridge. H-bridge is the simplest circuit for controlling a low current rated motor in car.

E. ROBOT CHASIS

Robot Chassis It is the central base to which all the components are wired and connected. It is operated with 2 tires and a front wheel which can move in 2 directions. The Tires are connected via 2 different motors which are essential for the robot to move and rotate in the required direction. The Entire Robot is powered thorough a 4v Battery which also powers the motor driver and the servo motor.

IV. SYSTEM WORKING

In the design there are two part transmitter and receiver in the transistor when press the micro switches crucial given some input of microcontroller, the microcontroller check the crucial input whose crucial press and what's the data or information transferring after this process the microcontroller1 decoded the input by the shaft module the receiver the data by shaft module and collected by receiver microcontroller and the microcontroller decrypting the information signal and display on the seven member and microcontroller transferring the data in dc Motor, and motors start the receiver part shoot feedback which data is receives, transferring by the RF module again the transmitter RF module admit feedback information and decoding by microcontroller and display on TV(liquid demitasse display). It's whole process grounded on the frequency modulation.

RF Wireless Communication Board has RF Encoder & Decoder Interfacing board with HT12D & HT12E IC chips. Features Easy uniting with the RF modules, using the womanish heads for placing the modules. Breakout legs for connecting to the microcontroller. 4 switches for homemade Testing Status LEDs and a switch button. Small size, high- quality PCB. On-Board power controller. Address line Chooser Switch Package Contents RF Encoder- Decoder board with HT12E, HT12D ICs and Address line chooser switch by using this line we can communicate 256 of tx & rf RX at a time.

We're trying to work with the each- pros and cons related to this design. Hopefully we could come with a model which will show the experimental view of Smart Display and control device through which the Idea of automated speed control conception to help the accident and control business would be more easily understood. We're actually presenting the layout of the design on which we will be working. principally it consists of two sections zone status transmitter according to the zone, it delays for many seconds, else unit and receiver(speed display and control) unit.

V.IMPLEMENTATION

Flow diagram of project:

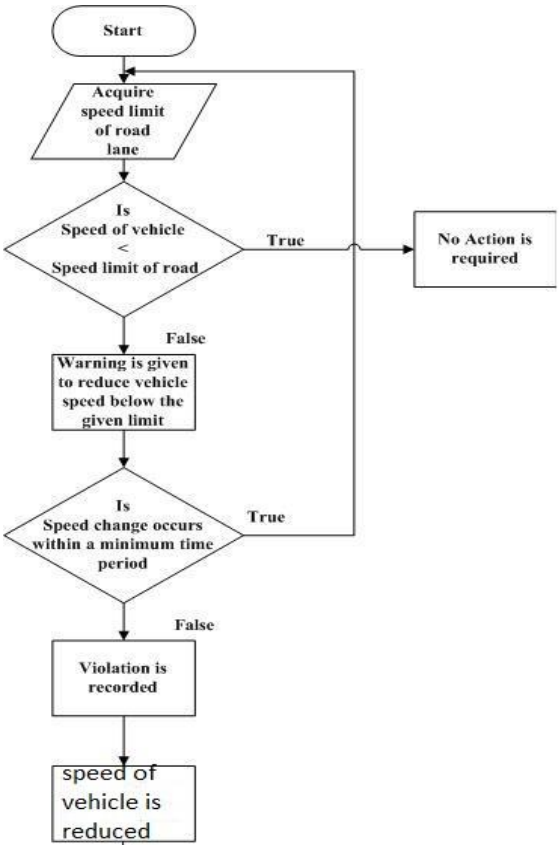


Fig. 2. Flow Chart of prototype

Accident prone areas are identified and respective speed limits are allocated to them. An RF transmitter is placed at every zone which transmits the speed limit of respective zone, RF receivers are placed in the vehicles and when the vehicle enters the zone, communication between transmitter and receiver establishes. The driver gets a notification in the lcd that he is in a low-speed zone and should reduce speed to the given level, if the message sent is ignored and if the speed is not reduced then the speed of the vehicle is gradually decreased automatically to the speed set in the receiver.

VI. RESULTS

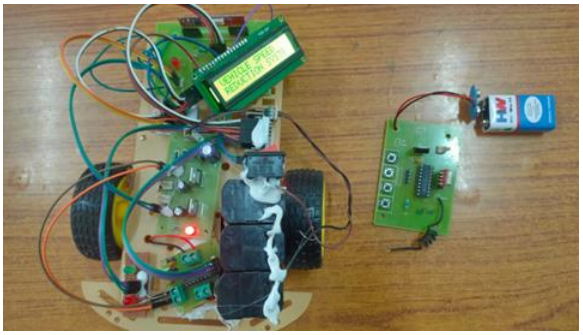


Fig. 3. Prototype of proposed model

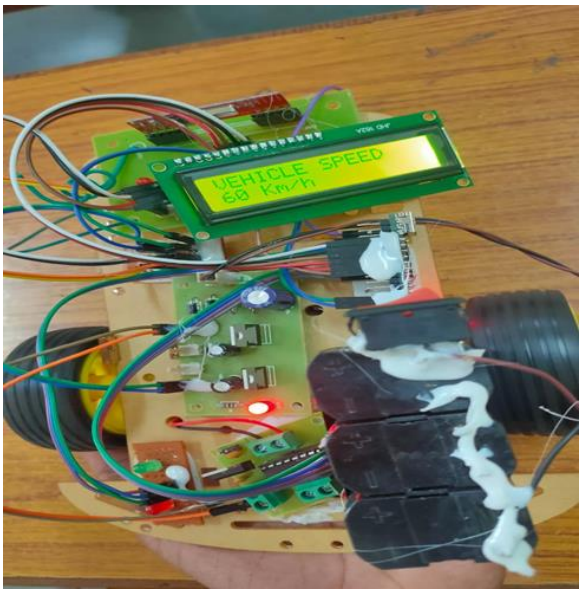
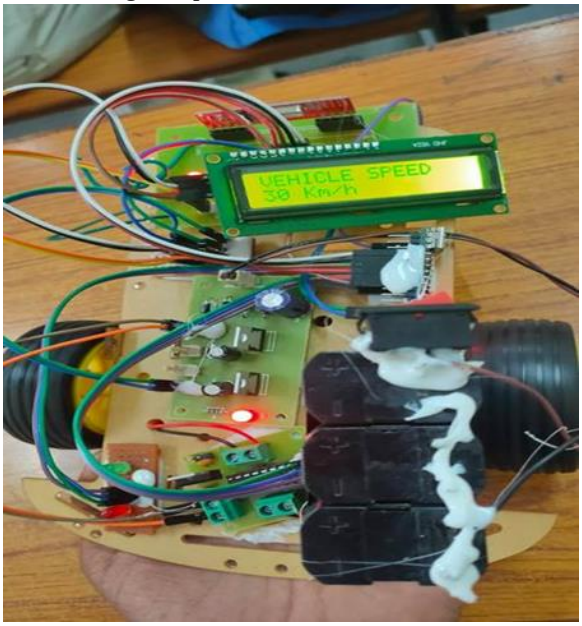


Fig. 4. Speed outside accident zone



VII. COCLUSIONS

In this project we implemented a new design to control the speed of the automobiles in accident prone areas. The

signal receives from the transmitter and the speed meter is compared by the controller. In this project, there are two cases: first, the current speed is lower than the transmitted speed the vehicle goes normally no action is required. second, the information from the speed meter is more than the transmitted speed by the transmitter module the

controller waits for some time whether the driver decrease the speed to the below value if the driver does not decrease the speed means it automatically takes the control and reduce the speed according to it.

VIII. FUTURE SCOPE

We are doing this project with keeping doors open for further modifications and more sophisticated analysis of speed controlling for vehicles. So, some fu true screlated to this project is given below: We wish to make a vehicle that can locate its position from the available map and decide by itself about the highest speed limit for any road or highway. An automatic vehicle is the ultimate target of this project that can run without the help of a driver and keeping the opportunity of the option from the operator of the car whether he or she would like to run the vehicle by himself/ herself or run the vehicle by autonomous system. In future we would like to recommend to introduce security system within the vehicle tracker with GPS and speed of that vehicle from remote places. In future we would like to work on a vehicle that will detect speed limits of roads and highways from signboards along the road.

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