IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

IoT Based Dynamic Vehicle Speed Control System

GVS.Bharadwaj kumar[1],M.Lahari[2],D.Sriharshitha[3],P.Gowthami[4],SK.Riyaz[5],K.Jagadeesh Reddy[6]

[1]Associate Professor, Dept: ECE, VEC, Kavali, Andhra Pradesh-524201
[2,3,4,5,6]UG Students Dept. Of ECE, VEC, Kavali, Andhra Pradesh-524201 India

Abstract -
Over speeding vehicle make lot of nuisance sometimes also leading to loss of lives and other damages . Also imposing speed restrictions through sign boards have been rendered fruitless wherein the vehicle drivers do not comply with it and resulting catastrophic. Vehicle Speed Limit Controller Project is a great solution to this problem as it not only provides speed limitations, it also implements it through a controlling mechanism . This, this system greatly helps in curbing the speed of over speeding vehicles ensuring safety of vehicles on accident prone road ways.

Index Terms -Power Supply, RFID Reader,Tag,IR Sensor,DC motor,L293d Motor driver,Pushbuttons,Nodemcu,16X2 LCD Display

I.INTRODUCTION

Now days road accidents are the greatest health burden in the world. People are driving very fast , Accidents occurs frequently. We lost our valuable life by making small mistake while driving.Speed has been identified as the cofactor in these road accidents.

II.EXISTING SYSTEM

- At present days 1/3 of accidents are associated with excessive speeds in places where sharp turnings, junctions exist as well as changes in the roadway like presence of road-work or unexpected obstacles and sometimes it may not be possible to view the signboards placed by highway department to alert the drivers in such kind of places there is a chance for accident.
- The driver or user of the vehicle has to look for sign boards and has to maintain the speed of the vehicle. In school zones, hospital zones etc, there are speed restriction sign boards mentioned at sideways of roads. When the vehicle enters the speed restricted area the driver has to reduce the speed of vehicle manually.

Fig2.1 Existing System

III.PROPOSED SYSTEM

IoT based "Dynamic Vehicle Speed Control System " is the best solution. In this proposed system, the main components are RFID Reader and Tag, Arduino Uno, Nodemcu, Dc motor,L293d Motor driver ,Push buttons , IR sensor, LCD .It can control the speed limit of vehicle using Radio Frequency Identification (RFID) Technology . By using this RFID Technology ,if the user tries to increase the speed, the system does not allow it to do so till it is in the range of RF speed sign post. This system uses Blynk app application which sends the information to user mobile using Nodemcu system.It consists different sensors with which the vehicle detects the speed restriction of that zone and maintains that particular speed.

3.1 BLOCK DIAGRAM

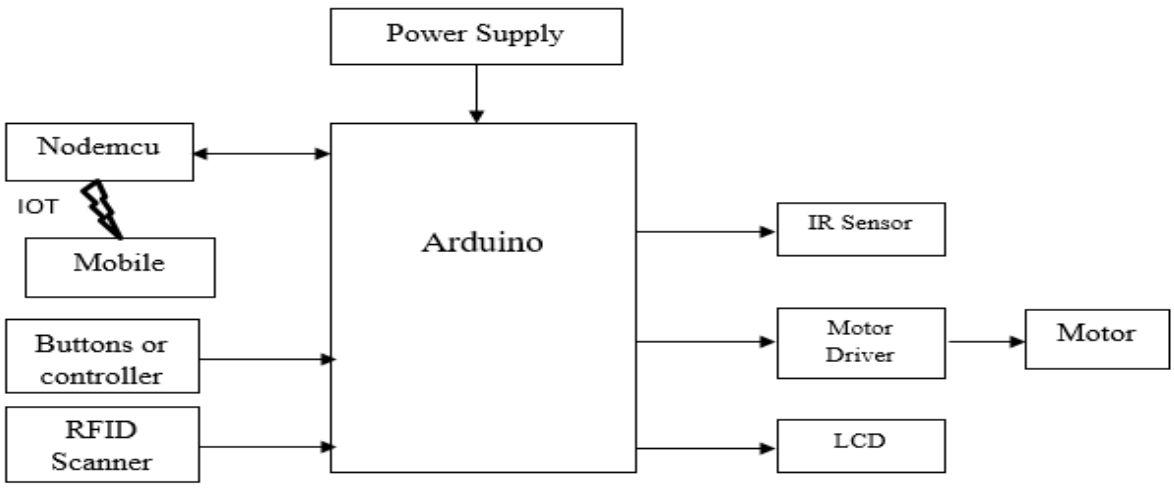

Fig3.1 Block Diagram of proposed System

3.2 ADVANTAGES:

1. Speed control
2. Accidents reduction

3. Low cost
4. Easy to implement

3.3 APPLICATIONS:

1. Cab be used at heavy traffic areas
2. Used in school and hospital zones

IV.COMPONENT DESCRIPTION:

4.1: HARDWARE COMPONENTS REQUIRED:

4.1.1: ARDUINO UNO

The Uno with Cable is a micro-controller board base on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs); 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything need to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

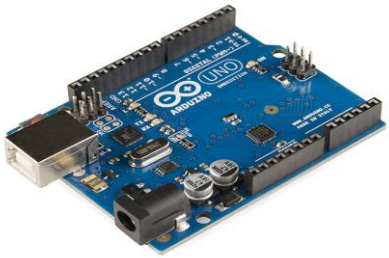

Fig 4.1.1: ARDUINO UNO BOARD

4.1.2: NODEMCU

The NodeMCU (***N***ode Micro Controller ***U***nit) is an open-source software and hardware development environment built around an inexpensive System-on-a-Chip (SoC) called the ESP8266. [5]The ESP8266, designed and manufactured by Espressif Systems, contains the crucial elements of a computer: CPU, RAM, networking (WiFi), and even a modern operating system and SDK. That makes it an excellent choice for Internet of Things (IoT) projects of all kinds.

Fig 4.1.2: NODEMCU

4.1.3 RFID

- RFID (Radio frequency identification) is a form of wireless communication that recognizes locations and identification of tagged items ,it leverages low-power radio frequencies to collect and store data.

Fig 4.1.3 RFID

4.1.4: IR SENSOR

IR sensor is an electronic device that emits the light in order to sense some object of the surroundings. [6]An IR sensor can measure the heat of an object as well as detects the motion. Usually, in the infrared spectrum**,** all the objects radiate some form of thermal radiation. These types of radiations are invisible to our eyes, but infrared sensor can detect these radiations.

Fig 4.1.4: IR SENSOR

4.1.5:PUSH BUTTONS

- A Push button or simply button is a simple switch mechanism to control some aspect of a machine or a process.
- The surface is usually flat or shaped to accommodate the human finger or hand, so as to be easily depressed or pushed. Buttons are most often biased switches, although many un-biased buttons(due to their physical nature) still require a spring to return to their un-pushed state.

Fig 4.1.5: Push button

4.1.6:L293D MOTOR DRIVER:

L293D is a basic motor driver integrated chip (IC) that enables us to drive a DC motor in either direction and also control the speed of the motor. The L293D is a 16 pin IC, with 8 pins on each side, allowing us to control the motor. It means that we can use a single L293D to run up to two DC motors. L293D consist of two H-bridge circuit. H-bridge is the simplest circuit for changing polarity across the load connected to it.

Fig 4.1.6:L293d MOTOR DRIVER

4.1.7:DC GEAR MOTORS:

A gear motor is an all-in-one combination of a motor and gearbox. The addition of a gear head to a motor reduces the speed while increasing the torque output. The most important parameters in regards to gear motors are speed (rpm), torque (lb-in) and efficiency (%). In order to select the most suitable gear motor for your application you must first compute the load, speed and torque requirements for your application.

Fig 4.1.7:DC GEAR MOTOR

4.1.8:LCD

LCD (Liquid Crystal Display) is the innovation utilized in scratch pad shows and other littler PCs. Like innovation for light-producing diode (LED) and gas-plasma, LCDs permit presentations to be a lot more slender than innovation for cathode beam tube (CRT). LCDs expend considerably less power than LED shows and gas shows since they work as opposed to emanating it on the guideline of blocking light.

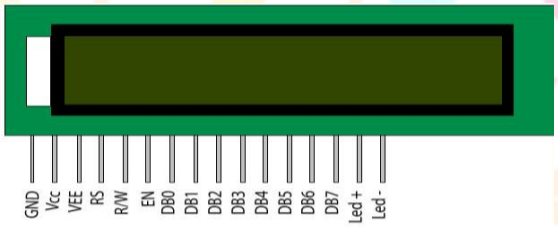

Fig 4.1.5: LCD

4.2: SOFTWARE REQUIRED:

4.2.1: EMBEDDED C

The extension of the C programming language is known as embedded C. It is generally used to develop microcontroller-based applications. Talking about the extension it is I/O fixed-point arithmetic operations, hardware addressing, accessing address spaces, and more.

4.2.2: ARDUINO IDE

The Arduino Integrated Development Environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of third-party cores, other vendor development boards.

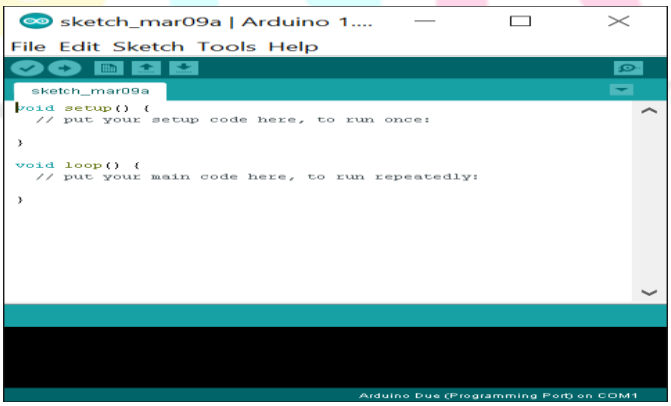

Fig 4.2.2: ARDUINO IDE

4.2.3:BLYNK APP:

Blynk is an Internet of Things Platform aimed to simplify building mobile and web applications for the Internet of Things. Easily connect 400+ hardware models like Arduino, ESP8266, ESP32, Raspberry Pi and similar MCUs and drag-n-drop IOT mobile apps for iOS and Android in 5 minutes.

V.RESULTS AND DISCUSSION:

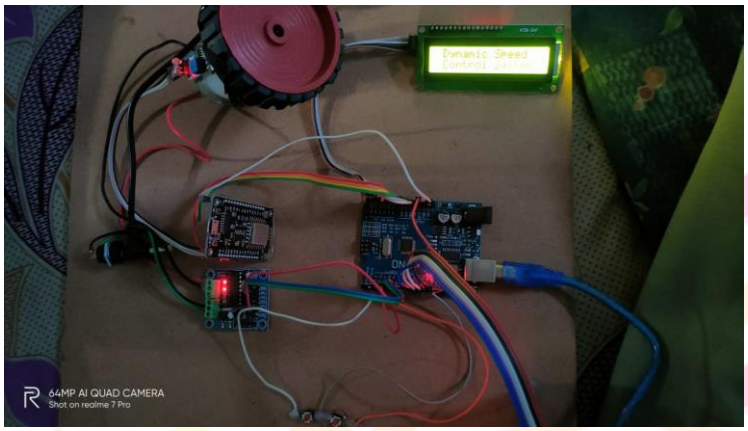

Fig 5.2 : Dynamic Vehicle speed control system

Dynamic vehicle speed control system will be displayed on the LCD

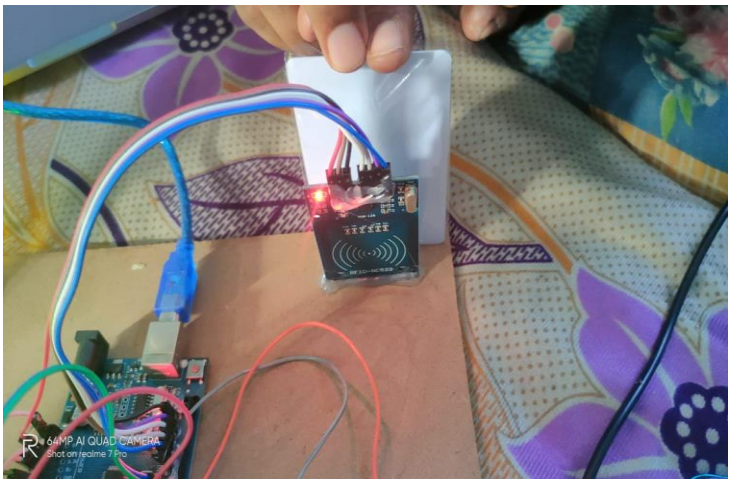

Fig 5.3 : Tag scanned

When the vehicle enters into A zone, the IR reader will scan the tag and automatically speed will be detected.

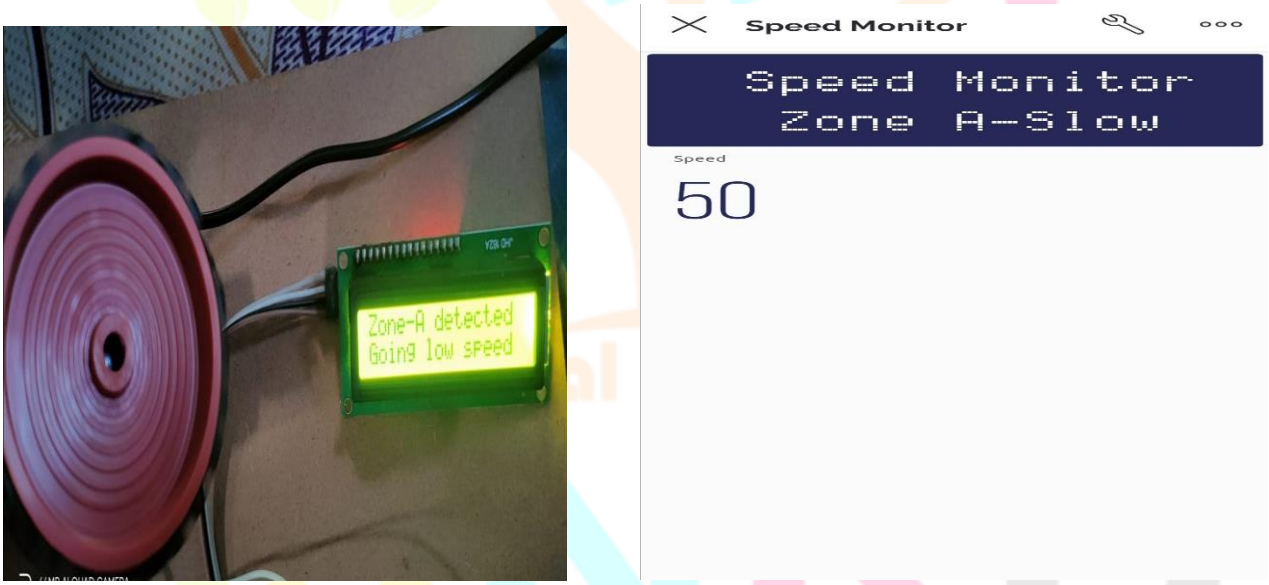

Fig 5.4 :A zone scanned

When the vehicle enter into A zone the speed will be displayed on the LCD and also the information will be sent to blynk app.

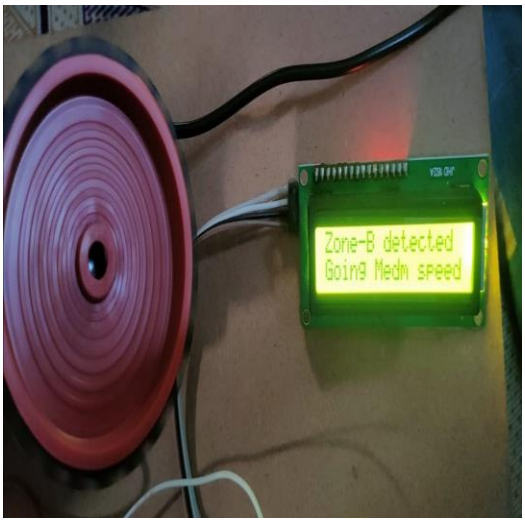

Fig 5.5:B zone scanned

When the vehicle enter into a B zone the speed will be display on the LCD and the entire Speed information will be sent to blynk app.

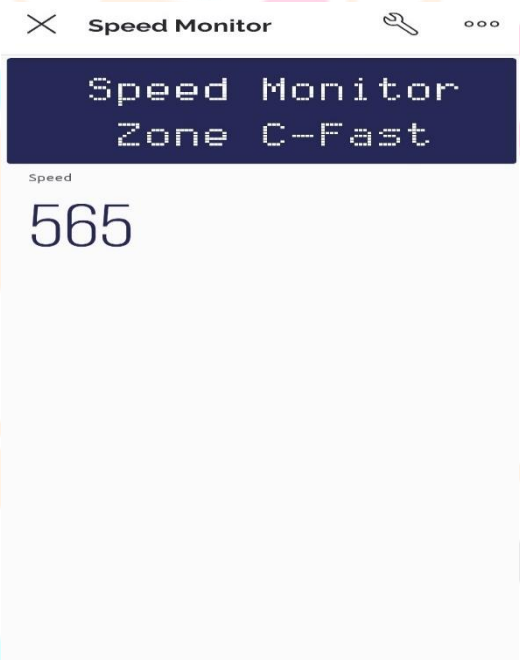

Fig 5.6: C zone scan

When the vehicle enter into C zone the speed will be display on LCD and the information sent to blynk app

VI. CONCLUSION

In this project, we have successfully designed and analysed an AUTOMATIC VEHICLESPEED CONTROL SYSTEM by using RFID Technology which controlling the vehicle speed commitment over all the roads depending on zone .It helps us to integrate theCapabilities of both systems to calculate, record and the historical Data to mobile device using IOT. By using this speed limitation mechanism speed of the vehicle is control and accidents can be reduced.

REFERENCES:

1.You-Ren Chen Keng-Pin Chen , and Pao-Ann Hsiung presented the "Traffic Light Optimization and Control System" Published in 19th International Conference on Intelligent Transportation System(ITSC) IEEE2016.
2.Himesh Gupta and Aditya Pundir presented the "RF Module BasedSpeed Check and seat Belt Detection System"Published in second International Conference on computational Intelligence & communication Technology IEEE2016.
3.Christoph Kandler and Tim Koenings presented the "Stability Investigation of an Idle Speed Control Loop for a hybrid Electric Vehicle".This article has been accepted for inclusion in a future issue of this journal.content is final as presented With the exception of pagination.IEEE2015.
4.Martin Treiber and Arne Kesting2 presented the"Automatic and efficient driving strategies.While approaching a traffic Light" published in 17th International Conference on Intelligent Transportation Systems(ITSC) IEEE2014.
5.Aamir Sarwar Jahan,and Imdadul Hoq, presented the "GPS Enabled Speed Control Embedded Systems Speed Limiting Device with Display and Engine Control Interface" in 2013.