VEHICLE SPEED CONTROLLING THROUGHEMBEDDED SYSTEM

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Abstract : This project aims to control the speed of any vehicles automatically in cities and also in restricted areas such as schools, parks, hospitals and in speed limited areas etc. Nowadays in a fast moving world people do not have self-control, which leads to accidents. So it is difficult for the police to monitor all the accidents. This project provides a way to control the speed without harming others. Driver does not control anything during such places; controls are taken automatically by the use of electronic system. In this project we are using RF modules for indicating the speed limit areas it is placed at the starting and end points of the restricted zones. RF receiver is placed inside the vehicle. Speed is acquired by the help of speedometer in the vehicle. The controller compares the speed. If it exceeds the limited speed the controller alerts the driver and control is taken automatically.

Keywords : Embedded system, Micro controller,ArduinoUNO.

INTRODUCTION

Automatic speed control of vehicle project aims to provide safety for vehicle rider. In the city's accidents is a major problem. Most of the accidents are due to over speed, and drunken drive. But the traffic department check whether the driver has consumed alcohol or not, it is difficult to check each and every driver on the road. To overcome the mentioned problem, we are designing a system that controls vehicle speed in particular zone. And detects alcohol consumption and also detect the accident an sends the accident location to the family person. This Usage of wireless RF technology to detect the areas where speed should be controlled. Speed of the vehicle is decreased while in smart zone. Designed system has speed reduction system and obstacle detection system. This system is useful for smart zones like Hospital, School, and Colleges etc. One RF transmitter will be placed in front of the smart zone. One RF

receiver attached with the microcontroller will be placed inside the vehicle.

The proposed work has an aim to control the speed of any vehicles automatically in cities and also in restricted areas such as schools, parks, hospitals and in speed limited areas. Out work provides a way for how to control the speed without harming others. The driver need not control the speed during driving and the controls are done automatically by the use of proposed embedded system.

. LITERATURE SURVEY

In Rubini.R, et al [1] proposed a system has an alerting, recording and reporting system for over speed violation management. The Zigbee transmitter sends the speed limit of the particular lane entered by the vehicle and also gives alerts like "road works", "steep slopes", "school zone" in the form of acoustical messages and also in LCD. The receiver unit placed in the vehicle receives the messages and sends to the microcontroller. When speed of the vehicle nears the speed limit it displays the warning and if exceeds the limit, the microcontroller records the violated speed and time. The LCD displays the lane speed limit and shows the number of times, speed was violated. A GSM module sends message to the nearest traffic personnel immediately after a violation occurs. An authenticated device is also provided, which can be operated only by the traffic police in which he can retrieve the data stored at any time. Increase in the count of violation increases the penalty amount which can be collected in toll

gates locate.

In S.P. Bunker, et al [2] described a real-time online safety prototype that controls the vehicle speed under driver fatigue. The purpose of such a model is to advance a systemto detect fatigue symptoms in drivers and control the speed of vehicle to avoid accidents. The main components of the system consist of number of real time sensors like gas, eye blink, alcohol, fuel, impact sensors and a software interface with GPS and Google Maps APIs for location.

In G.Sathya, et al [3] achieved with the help of "AARS usingGPRS 3G TECHNOLOGY". Through this, we can provide a smooth flow for the ambulance by controlling the traffic light according to the ambulance location to reach the hospital. The location of the ambulance can be easily identified with the help of the GPS unit installed in it. A controller in the traffic junction can automatically control thetraffic flow and thus reduces the time delay taken by ambulance to the hospitals. The traffic junction band the ambulance will have GPRS 3G modem to communicate between them. The chances of misusing the ambulance can overcome with the help of an RFID tag given to the doctor"sin the respective hospitals so that the security can be attained.. This scheme is helpful for the Traffic police to control the traffic thereby helping the patients who are facingemergency.

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EXISTING SYSTEM

Existing systems for vehicle speed control through embedded systems typically use a combination of sensors, actuators, and control algorithms. The sensors are used to measure vehicle speed, engine RPM, and other relevant parameters, while the actuators are used to control the throttle, brakes, and other vehicle systems. The control algorithms are used to process the sensor data and determinethe appropriate actions to take to maintain the desired speed.

One common approach to vehicle speed control is PIDcontrol, which uses a feedback loop to adjust the throttle or brakes based on the difference between the desired speed andthe actual speed. Another approach is fuzzy logic control, which uses a set of rules to determine the appropriate actionsto take based on the sensor data. Model predictive control is another approach that uses a mathematical model of the vehicle to predict its behavior and determine the best actionsto take to maintain the desired speed.

Existing systems for vehicle speed control through embedded systems also face a number of challenges, such as the need for accurate sensor data, the need for reliable actuators, and the need for robust control algorithms that can handle a wide range of driving conditions. Additionally, there is a need to balance the demands of speed control with other vehicle systems, such as stability control and emissions control, to ensure safe and efficient operation of the vehicle. Existing systems for vehicle speed control through embedded systems typically use a combination of sensors, actuators, and control algorithms. The sensors are used to measure vehicle speed, engine RPM, and other relevant parameters, while the actuators are used to control the throttle, brakes, and other vehicle systems. The control algorithms are used to process the sensor data and determine the appropriate actions to take to maintain the desired speed.

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PROPOSED SYSTEM

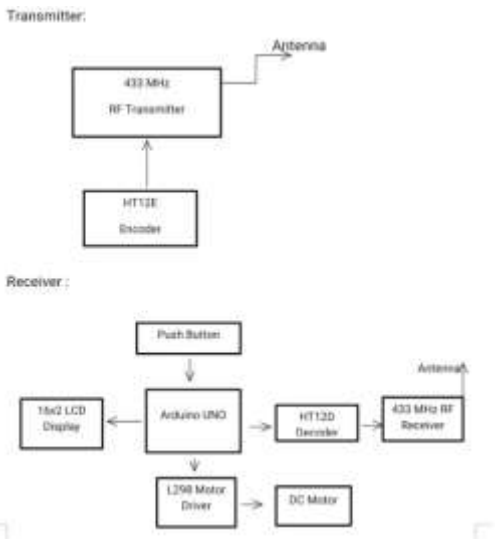
A proposed system for vehicle speed controlling through embedded system would involve the development of a new system or the optimization of an existing system to improveits performance. One possible approach could be to integratemachine learning or artificial intelligence algorithms into thecontrol system to improve its ability to adapt to changing driving conditions.

Another approach could be to use advanced sensors, such aslidar or radar, to improve the accuracy of the sensor data andprovide more detailed information about the vehicle's surroundings. This could help the control system to make more informed decisions about the appropriate actions to take to maintain the desired speed.

A proposed system could also involve the development of new control algorithms that are optimized for specific driving conditions or vehicle types. For example, a control algorithm that is optimized for highway driving may be different from one that is optimized for city driving.

Additionally, a proposed system could involve the integration of other vehicle systems, such as stability controlor adaptive cruise control, to improve the overall performance of the vehicle. This could help to ensure safe and efficient operation of the vehicle, while also improving the comfort and convenience of the driver.

BLOCK DIAGRAM



MODULES

- Microcontroller
- RF Module
- DC Motor
- Arduino UNO
- LCD Display MICRO CONTROLLER

The PIC 16F877 microcontroller, is one of thmost advancedMicrocontroller from Microchip. This is used for experimental and modern applications because of its lowprice and variety of applications [6]. It is suitable for embedded system applications such machinecontrol,measurement devices,study purpose, and so on.In addition to that it has performance RISC CPU,EEPROM,Flash memory and data memory also.

RF MODULE

Let's take a closer look at the 433MHz RF Transmitter andReceiver Modules.

THE TRANSMITTER

This tiny module serves as the transmitter. It is as simple as it appears. At the core of the module is a SAW resonator tuned to operate at 433xxMHZ.

THE RECIVER

This particular module is a receiver. It is as simple as thetransmitter module, despite its appearance. It consists of anRF tuned circuit and a couple of operational amplifiers (OPAmps) that amplify the received carrier wave. The amplifiedsignal is then fed into a PLL (Phase Lock Loop), whichallows the decoder to "lock" onto a stream of digital bits,resulting in improved decoded output and noise immunity. Originalposition.

DC MOTOR

A DC motor is an electric motor that runs on direct current power. In an electric motor, the operation is dependent uponsimple electromagnetism. A current-carrying conductorgenerates a magnetic field, when this is then placed in anexternal magnetic field, it will encounter a force proportionalto the current in the conductor and to the strength of theexternal magnetic field. It is a device that converts electricalenergy to mechanical energy. It works on the fact that acurrent-carrying conductor placed in a magnetic fieldexperiences a force that causes it to rotate with respect to itsorginal position.

ARDUINO UNO

Arduino is an open source computer hardware and softwarecompany, project, and user community that designs andmanufactures single-board microcontrollers andmicrocontroller kits for building digital devices andinteractive objects that can sense and control objects in thephysical and digital world. The project's products aredistributed as opensource hardware and software, which arelicensed under the GNU Lesser General Public License(LGPL) or the GNU General Public License (GPL),permitting the manufacture of Arduino boards and softwaredistribution by anyone. Arduino boards are availablecommercially in preassembled form, or as do-it-yourself(DIY) kits. Arduino board designs use a variety ofmicroprocessors and controllers. The boards are equippedwith sets of digital and analog input/output (I/O) pins thatmay be interfaced to various expansion boards orBreadboards (shields) and other circuits. The boards featureserial communications interfaces, including Universal SerialBus (USB) on some models, which are also used for loadingprograms from personal computers. The microcontrollers aretypically programmed using a dialect of features from theprogramming languages C and C++. In addition to usingtraditional compiler toolchains, the Arduino project providean integrated development environment (IDE) based on the Processing language project.

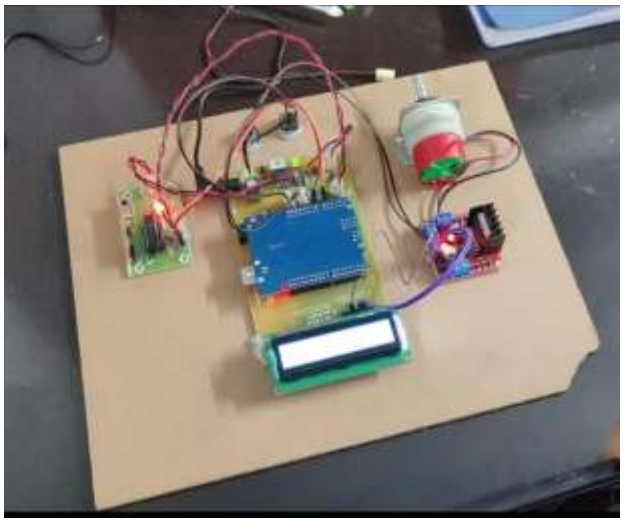
LCD DISPLAY

The term LCD stands for liquid crystal display. It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc. These displays are mainly preferred for multi-segment light-emitting diodesand seven segments.

ADVANTAGES

- Increase Road safety among vehicles.
- Prevents most accidents occurring due to overspeed.

OUTPUT



CONCLUSION AND FUTURE SCOPE

Vehicle speed controlling through embedded systems is an area of research that aims to improve driving safety,

efficiency, and comfort. It involves the use of sensors, actuators, and control algorithms to maintain the desired speed. Proposed systems could involve machine learning orartificial intelligence algorithms, advanced sensors, or the integration of other vehicle systems.

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