

Automatic Vehicle Speed Reduction System in Various Zones

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Abstract—This paper describes the automatic speed control mechanism of vehicles where speed restricted areas such as schools, hospital zones etc. The drivers drive vehicles at high speed even in speed limited areas without considering the safety of the public. The traffic police are not able to control them with full effect. Also it is not practical to monitor these areas throughout. The RFID technology is used for reducing the speed of the vehicles gradually, in speed restricted areas. The RFID reader is fixed along with the vehicle and the RFID Tags which will be placed on signposts of particular zone. These tags are programmed to send a coded signal when the reader comes in proximity. At any time the vehicles enter into these zones their receivers will acquire this code and the speed of the vehicles is managed automatically with the help of the microcontroller unit. The tags are placed at the beginning and the end of the regions for which the speed should be reduced.

Keywords—RFID, Driver Assistant System, Peripheral interface controller, Audio Voice Recognizer, RFID tag.

1. INTRODUCTION

In line with research via US department of transportation, speeding is a factor in about one-1/3 of all fatal crashes, killing greater than a thousand persons within the nation each month. In 2006, 12,500 persons died in pace associated crashes. The country wide freeway visitors safeguard administration estimates that the financial fee of pace related crashes is greater than \$forty billion each year. Significant study has been conducted on the outcome of the pace of individual vehicles involved within the crash, showing on exponential relation between pace and crash cost. In addition, vehicles travelling at 80mph use from ten to twenty

percentages more fuel than those travelling at 70mph. There is not any doubt that a growing automobile pace raises the emissions of carbon di oxide, nitrogen oxide and generates extra noise.

The most important thing idea present by the use of this paper is to make use of radio frequency identification (RFID) technological know-how to control the % of the car in percent limited areas (institution, university, health center zone) to preclude accidents. The avenue velocity limits robotically and alerting the drivers when they exceed the pace limits is possibly useful as they can help to manage speeding and consequently prevent a massive quantity of accidents from happenings. The relaxation of this paper is prepared as follows: First we in short introduce current speed limits method and their elements; then we introduce our approach starting with passive RFID science with antenna direction and tag response velocity been studied in detail to show the feasibility of the design, then using lively RFID science is investigated and we proposed options to avoid energetic tag confusion.

2. EXISISTING SYSTEM

The current pace warning techniques comprise GPS system & velocity signal consciousness headquartered on actual time photo processing. GPS localization has a restricted monitoring accuracy of 10 to twenty meters. But underneath distinctive circumstances corresponding to in environment they aren't ready to that the function of vehicle is thoroughly located. This will likely result in an mistaken speed limit studying. The map & the pace restrict database one pre-loaded into the device, which means they don't seem to be updated in real & could include obsolete expertise the present pace warning method comprise GPS method & speed signal awareness based on actual time photograph processing. GPS localization has a constrained tracking accuracy of 10 to twenty meters. However below precise instances

corresponding to in environment they aren't capable to that the role of vehicle is safely located. This will likely lead to an flawed speed limit reading. The map& the pace restrict database one pre-loaded into the gadget, because of this they are not up-to-date in actual &might include obsolete know-how.

3. PROPOSED SYSTEM

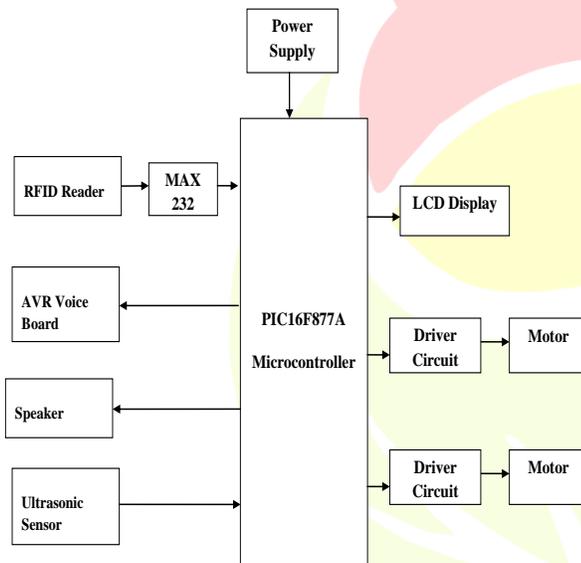


Fig. 1. Proposed system

RFID is an auto ID technology using radio waves to automatically identify people or objects. The basic components of a typical RFID system include: the transponder or the tag, which is a microchip in which a unique serial code is stored and transmitted when necessary via an attached antenna; the RFID reader, which is used to receive and identify the information sent by tags. RFID is already in use in some of the transport related applications, such as vehicle parking or detection systems, where tags are attached to vehicles and readers or deployed at control points to identify the vehicles passing by temporary speed limit can be easily introduced by changing or implementing new tags, it will be simpler, cheaper and easier to maintain. The idea of our approach is to adopt RFID to help drivers gather speed limit data on the road; to alert the driver when speeding; to limit the vehicle speed automatically. However, since it is the road side devices that are providing the information, we are interested in using RFID in the opposite way to current systems by locating tags at road side and readers in vehicles. In our research the speed limit are stored in RFID tags which

will be embedded on certain points of road surface. When a vehicle passes such a surface point on a specific road, a reader installed in the vehicle will retrieve the corresponding speed limit information from the tags. Such information could then be indicated on a car display, or we used for driver warning system to adopt the driver they are speeding. The speed limit readings of our system would be reliable in all weather conditions without the need to listen to satellites or base stations, the system will be suitable for all areas. New road plan temporary speed limit can be easily introduced by changing or implementing new tags, it will be simpler, cheaper and easier to maintain.

4. RFID

Radio frequency identifier is a technology that incorporates the use of electromagnetic coupling in the radio frequency portion of the electromagnetic spectrum to uniquely identify an object, animal, person. RFID is used in industry as an alternative to the barcode. The advantage of RFID is that it does not require direct contact or line of sight scanning. At their easiest, RFID methods use tiny chips, called “tags”, to contain and transmit some piece of opting for information to an RFID reader, a gadget that in turn can interface with computer systems. To begin figuring out RFID, suppose of conventional point-of- scale barcode reader scanning grocery barcodes. In its simplest type, an RFID method is far the same.

In an RFID procedure, RFID tags are “interrogated” by using an RFID reader. The tag reader generates a radio frequency “interrogation” sign that communicates with the tags. The reader also has a receiver that captures a reply signals from the tags, and decodes that sign. The reply signal from the tags displays, both actually and figuratively, the tag’s information content material. The reply signal is created as passive “backscatter”.

RFID WORKING

A RFID approach has three parts

1. A Scanning antenna
2. A Transceiver with a decoder to interpret the information
3. A Transponder-The RFID tag- that has been programmed with information

The scanning antenna places out the radio frequency signals in a reasonably quick variety. The RF radiation does two things:

1. It supplies a means of speaking with the transponder (RFID tags).
2. It supplies the RFID tag with the vigor to be in contact (within the case of passive RFID tags).

This is an undoubtedly key a part of the science: RFID tags do not have got to incorporate batteries, and may for this reason stay usable for very long intervals of time (may be many years).

The scanning antennas can permanently affix to a floor: handheld antennas are additionally available. They are able to take something form you want: for instance, you would construct them into a door frame to accept information.

A)TAG

RFID Tag that comprises their possess vigor supply is known as as active tags. It does not incorporate possess power source method passive tags. It does not contain own power source means passive tags. The passive tags activated by the radio frequency. Small electrical current is enough for ID number transmission. Active tags have more memory so it can achieve greater range of reading. RFID tag is alternative to barcode scanning method. Although more expensive to use than the barcode stickers. RFID tag does not falloff line-of-sight between reader and tag. It is also used for medical purposes.

RFID tagging ID system is used for radio frequency identification and tracking purpose. It entails the tag itself, learn and write gadget, host method software for information assortment, processing and transmission. It consists of chip, memory and on antenna.



Fig .2.RFID Tag

5. WORKING

We can control the speed of the vehicle through the radio frequency. The transmitter will receive the sign in the predetermined subject handiest. When transmitter receives

the signal, automatically it will show as tuition zone and control the velocity limit of vehicle. The application for the microcontroller is written using embedded C.. The transmitters are programmed to send the coded signals continuously with certain delay in between .Whenever the vehicles enter into these zones their receives will receive this code and then the speed of the vehicles is controlled automatically with the help of the microcontroller unit present inside the vehicles. The microcontrollers are programmed such as to control the speed of the vehicles whenever it receives the code. The transmitters are placed to transmit these codes up to a distance for which the speed should be reduced. The equal code can be utilized in every single place wherever such zones are there to control the accidents.

i) POWER SUPPLY

A power supply is an electronic device; it supplies electrical energy to an electrical load. The main function of a power supply is to convert one form of energy to another form of energy. Power supply must obtain the energy supplies to its load, as well as any energy it consumes while performing the task, from an energy source. It has a vigor input, which receives vigor from the power source and a power output that delivers energy to the load and it consists of electrical connectors. The step down transformer is used to convert the input voltage (230v) to AC voltage (12v). A rectifier is used to convert the output voltage to a varying DC voltage.

ii) MICROCONTROLLER (MC) (PIC16F877A)

A microcontroller consists of inbuilt memory, general 35 input and output pins, 8MHZ crystal frequency oscillator. A microcontroller having five ports and port A and port E contains analog to digital converters. The PIC16F877ACMOS FLASH-established eight-bit microcontroller. This is strong 200ns instruction execution Specification:

368 bytes RAM data memory

32 programmable I/O lines

40 pin package

256 bytes of EEPROM data memory &self-programming

8 channels of 10-bit Analog-to-Digital (A/D) converter

5V power supply

iii) LCD DISPLAY

Liquid Crystal Display. A 16×2 LCD can display 16 characters per line, there are two such lines. In this LCD each character displayed in 5×7 pixel matrixes. The LCD display receives coded signal from the microcontroller and display the output (school zone, college zone, etc.). Principle of Liquid Crystal Display is blocking light rather than emitting light. It requires backlight has they do not emits light by them. We use this LCD or exhibiting the pace of the car when it is entered into RFID zone and traditional zone.

iv) MAX 232

It is mainly used to reduce the voltage fluctuations (0-5v) and communicate with the microcontroller. MAX 232 is an integrated circuit (IC232 – 16 pin). It's a twin RS232 receiver/ transmitter that meet all RS232 specifications even as utilizing most effective 5V vigor deliver. It has four level translators, two of which are RS232 transmitters that convert input levels into +9V RS232 outputs. The opposite two stage translators are RS232 receivers that convert RS232 enter to 5V.

v) RFID CARD READER

An RFID reader is a device that is used to interrogate an RFID tag. The reader has an antenna that emits radio waves; the tag response by sending back its data. RFID tags transmits their identification code and are detected by the RFID readers onboard the vehicle. The understanding is transmitted to a MC, which determines the correspondence between tag identification and readers. This MC communicates the new goal speed as well as different important data.

vi) AVR VOICE BOARD

Automatic Voice Board can be used for store the voice up to 32 voices. It includes recording, erase, play, fast forwarding, reset, and volume buttons, easy to interface with the microcontroller pin headers. We can easily interface an audio amplifier to the speaker outputs.

vii) SPEAKER

A speaker is used to intimate the status of vehicle when entering the school zone and various zones. Speaker is one of the most common output device used with computer systems. The purpose of the speaker is to produce audio output that can be heard by the listener. Speakers are used as transducers that convert electromagnetic waves into sound waves. Input may be either in analog or digital form.

viii) ULTRASONIC SENSOR

Ultrasonic sensor is used to find distance of the front and back cars. Ultrasonic sensors are devices that use electrical-mechanical energy transformation to measure distance from the sensor to the target objects. It consists of transmitter and receiver as a single unit.



Fig.3.Ultrasonic Sensor

ix) DRIVER CIRCUIT

The driver circuit is used to drive the DC motor. The input of driver circuit is +5V from the microcontroller unit is passed through the resistor to keep the electronic devices from the over voltage. The relay have four parts: two relays for first driver circuit and another two relays for next driver circuit. It is used to regulate or convert the voltage from 12V to 5V. A relay is an electrical change that opens and closes below the manipulate of an extra electrical circuit. In the common form, the switch is operated through electromagnet to open or close one or many units of contact, considering that of the relay is equipped to manage an output circuit bigger energy than the enter circuit. An electrical motor is a computer which converts electrical energy into mechanical vigor.

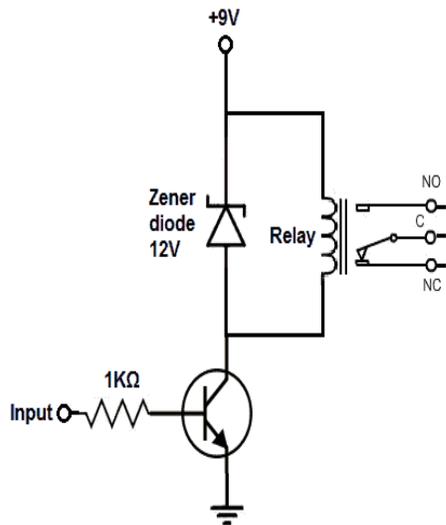


Fig.4.Driver circuit

x). DC MOTOR

A DC motor is designed to run on DC electrical vigor.

When electric field passes through the coli in a magnetic field and magnetic force produces a torque which turns the DC motor. Finally it can be reduce the speed of vehicle.



Fig.5.DC motor

6. CONCLUSION

In this paper we investigated about the automatic speed reduction system based on RFID technologies. Both active and passive system shows potential in such application. A passive RFID system is cheap and reliable tag design which is suitable for massive implementation for large scale applications. Using of this passive RFID system also brings the benefit of easy maintenance as they do not need battery and be reprogrammed remotely. Since the active RFID are preferred for small scale applications like temporary speed limiting systems which costs low.

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