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School Zone Vehicle Monitoring System Based On IoT Cloud

Ramana Boina Kalyani[1], Dhanika Srinivas[2]

[1,2]Assistant Professor, Dept. of. Electronics and Communication Engineering, Vignan Institute of Technology and Science, Yadadri Bhuvanagiri -Telangana, India.

Email: kanni.471@gmail.com

ABSTRACT

Day by day, road injuries are growing. The primary explanation for these malfunctions is because of the rash or pace of the car. This system for speed regulation can help to restrict vehicle speed. The machine is equipped with a compact microcontroller that decreases hardware sizes and costs. The new scheme recommends even a child protection mechanism planned especially for children on school routes. The device conducts different functions, such as identification of vehicle details utilising the iOT cloud service, which interchanges the data by means of radio waves with the RF Reader and shows the names of each school on the computer. This helps the driver to know the route and monitor the car by means of safety measures.

Keywords: Cloud, Big data, Security, Privacy, COVID-19

1. Introduction

Accidents usually happen because of rash driving and road speed. Drivers rash don't bother people's lives. As cars rise, the number of injuries is rising year after year. In order to prevent injuries, the Government has taken several measures. While a laser control device is produced by most manufacturers, their costs are too high. It is not able to be properly detected when human beings cross the road, so we tried to develop a system easily. The IR module has been replaced instead of Laser and works only under a sight line. We agreed eventually to use RF. In the school zone, the RF transmitter is placed and the receiver is placed in the car. The controller collects information on the vehicle and the current speed is controlled by a special module or via an ultrasonic sensor that provides the controller with details. The controller begins with a driver velocity comparison. The controller transfers and restricts the vehicle speed automatically if the driver does not slow down. If malfunctions, theft or kidnapping occur in the vicinity of the school area, driver information, speed and registration will not be transmitted to the management of the school using an IoT module by the controlley. The management will transmit the information stored in an IoT module to the nearest police station. The owner then pays the penalty amount.

2) Literature Review

i) Abhirup Das, Abhisek Ray, Abhisek Ghosh, Swarasree Bhattacharyya, Debaleena Mukherjee, T.K. Rana, "Conventions on automobile accident avoidance cum control scheme for places"- The suggested system for minimising injuries by tracking the driver's eye blinking. It displays the somnolence, the challenges on the path and the drivers' intoxicated condition. The automatic pre-cautionary system is enabled on the basis of the above alarm. The crash and its possible position often occur at the nearest police station which helps prompt medical assistance. In normal cases, due to unavailability of accident information, no medical assistance is received. This mainly occurs at night and on low traffic roads.

(ii) In Jung Lee, Hoseo University 336-795, Baebangmyun, Asan, Chungnam, 'The Highway Using Vehicle Tracking System of Accident Detection'ICTC 2011- An accident identification for a car stream has been paved through the planned framework. That monitors each lane's vehicle. In case of an accident, the lane has no stream and the control device still identifies the accident.

iii) Prashant A. Shinde, Prof. Mr. Y.B. Mane "The innovative Raspberry-based automotive monitoring and monitoring device." IEEE Ninth ISCO,2015-There is a comparison of the current vehicle track and already-specified track within a Raspberry pi file system within a vehicle whose position is to be determined on a webpage and monitored in real time. If the speed of the vehicle reaches the stated amount, the alert message is also transmitted from the device to the mobile owner.

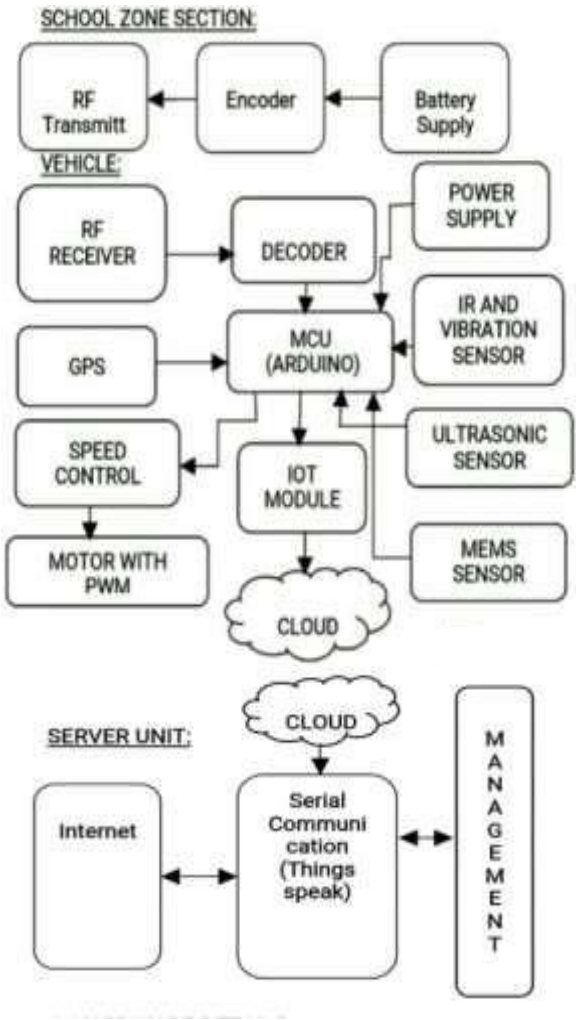
3. Proposed System

A potential alternate way to cope with road injuries would be by directly mounted mobile transport sensors in private, public and other volunteer cars. A rapid processing of high-traffic data in real time is necessary to avoid collisions in such a scenario. Our IoT Cloud technology is really useful for essential resources such as ambulances, aside from private drivers. Experimental prototype reveals that we have acceptable reaction time that enables drivers to receive warning alerts in time to deter future incidents..

4. System Design

Chips and interfaces - Encoder chip, decoder chip, RF-Container- Module, IR- and vibration sensors, Mems- sensors, GPS, PWM motors, Ardunio United Nations controller, IoT module, LCD monitor - are used in the block device..

BLOCK DIAGRAM



a) Hardware Details

i) RF Transmitter/Rf Receiver Module

The transmitter and the recipient (TX/RX) pair run at 433MHz. The speed of transmission is 1Kbps-10Kbps. The transmitted data was processed at the same frequency as the transmitter by an RF receiver [4]. 32 KB of ATmega 328 (with 0.5 KB used for the bootloader). The SRAM is already 2 kB and the EEPROM is 1 KB. The Uno Arduino has a set of computer, another Arduino or other microcontroller communications facilities[5]. The ATmega32, which is usable on 0 (RX) and 1 optical pins, has UART TTL (5V) serial connectivity (TX). RF Receiver is needed to obtain the data from the roadside transmitter. RX has four pins identical to the transmitter's.

ii) Arduino UNO:

The Arduino Uno is an ATmega328-based microcontroller board (datasheet). It consists of 14 optical input/outcome pins (of which 6 can be used to output PWM) and 6 analogue inputs and a 16-MHz ceramic resonator. It contains all the required functionality to help the microcontroller; only attach it to a device using a USB cable or power it to start using an AC to DC adapter or battery.

iii) UART:

The UART controller is the main part of the computer's serial communications subsystem. The UART is a UART controller. A UART is used to translate the knowledge transmitted at either end of the link between its parallel and its sequential form. A shift register is the secret to converting between serial and parallel types in each UART..

iv) **Ultrasonic Sensors**

Often referred to as transceivers (send and receive). Echos that receive a sensor[4] are produced by ultrasonic sensors which produce high-frequency sound waves. In order to evaluate the distance from a single entity, sensors measure the time period between signal sending and

received echo. The gap from car 1 to car 2 here is 50 cm. When vehicle 2 is 50cm from vehicle 1, take the right side immediately and it begins to roll. [1] [1] [1]

v) GPS

A satellite-based navigation system composed of at least 24 satellites is the Global Positioning System (GPS). A GPS receiver must be locked to the signal of at least 3 satellites to measure your 2-D location (latitude and longitude) as well as monitor travel. The GPS device can measure additional details after your location is identified. Speed, track, distance from target, period for sunrise and sunset. In the open area, the antenna transfers the signal..

vi) IOT SIM800

An IoT module is a tiny electronic system that communicates and transfers and collects data to wireless networks. SIM800 is a robust SMT-type GSM / GPRS quad-band solution that can be implemented into customer applications. Quadband 850.900.1800.1900 MHz is supported by SIM800. It can transmit low-power speech, text messages, and data details.

vii) IR Sensor

An IR sensor can both quantify and sense the temperature of an object. These types of sensors only test infrarot radiation, not release it like a passive IR sensor[4]. Both artefacts radiate thermal radiation, typically in the infrarot range. This kinds of radiation that can be sensed by an infrarot sensor are invisible for our eyes. When another vehicle moves on the car's side 2, the car 2 ceases and is in the same place.

viii) Sensors of Vibration

We can calculaVe and evaluate displacement, linear speed and acceleration using vibration sensors. The sensor displacement, speed or acceleration depends on the interest frequencies and the signal level concerned. The damping coefficient defines the friction which causes the mass to settle, and its natural rate is the rate at which the mass vibrates forward and backward. It is primarily used to detect injuries.

ix) **Encoders and Decoders**

Digital IC encoders are typically comprised of a screw, usually set to signify the operation. There are 2^n input lines and n output lines with a code of zeros and n output lines reflecting each input line. The encoder may also be used for simultaneous data translation into serial data in RF communication. Digital ICs for encoding are decoders. A decoder may be used to collect the necessary data from the code or to get parallel data from the demanded serial data..

x) 16X2 LCD Display

The LCD is a module for the computer viewing of a transparent picture of liquid crystal.

The 16X2 LCD monitor is the most widely used base module in DIYs and circuits. 16X2 reveals 16characters in 2 of these lines per section. Each character in this LCD is shown in a matrix of 5X7 pixels. LCD Socket, Contrast Change Preset, Interface Header and Backlight Power Jumper are key sections of the board. The LCD is used to verify if the vehicle is in stability or instability in the neighbourhood of school.

xi) MEMS Sensor

The LCD is a module to display a clear liquid crystal image from the screen.

The 16X2 LCD display is the most common DIY and circuit base module. In 2 of these lines per segment 16X2 shows 16characters. The matrix of 5X7 pixels displays each character in this LCD. The main components of the board are LCD Port, Contrast Shift Preset, Interface Header and Power Jumper Backlight. The LCD tests if the car in the school neighbourhood is in stable or chaos.

b) Software Details

ARDUINO SOFTWARE: Arduino consists of a software or IDE (Integration Creation Environment) board both a physical and a programmable circuit board to run on your machine code. In this scenario, IoT (the ESP8266 module's microcontroller is connected) sends data using the WiFi trigger. Embedded C is the term used here.

5. Conclusion

There is a separate transmitter with stop information in the speed boundary field. The speed does not reduce as the car reaches the usual field and normal and thus no intervention is required. But the velocity is reduced as the vehicle reaches the restricted regions. The transmitter module transmits information containing the speed limit which a vehicle may exceed inside the restricted speed range. The receiver then receives the signal or information and the signal received from the speed metre is transmitted to the controller. The signal is actually analogue and is translated by a computer processor into numerical one. Processor contrasts the signal from the transmitter and the speed metre. The current speed is initially lower than the transmitted speed and no intervention is taken when the vehicle goes normally. The controller waits for several seconds to decide whether the input from the speed metre reaches the speed transmitted on the transmitter module, whether the driver has cut the speed to below the amount, and if the speed driver does not cut the speed, it takes control and reduces the speed as desired. The details is simultaneously sent to the closest police station. The vehicle number and time are included in the records. The closest toll or check post shall receive fine or

penalty numbers. The power is finally given to the driver by the master. V2v messaging, VANETs, crash prevention and obstacle mitigation vehicles had the advantages of the proposal.

6. Future Scope

In the future, the characteristics of the cars here proposed would be used to render the device more powerful in a single car. The car will be used to mitigate congestion and noise pollution with hybrid renewables. Implementation of automated engine drive management should be enhanced to help distract hazards and prevent cars. This ensures that rash vehicles in restricted areas are under surveillance.

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Author's Biographies

First Author: Ramana Boina **Kalyani**,
M.Tech (Embedded systems)

Assistant Professor

Second Author: **Dhanika Srinivas**
M.Tech (VLSISD)

Assistant Professor