



Accident Prevention System Using Real Time Embedded Technology

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Abstract

Two different aspects are presented in the proposed system: a transmitter and a recipient. The velocity boundary is controlled immediately after entering the emitter area by receiving a signal from the RF transmitter. A few meters even before the area, the significantly impacted might be put for this purpose. The surveillance program contains an alcoholic detector, an eye detector, and a smoke detector. GPS and GSM for the detection of incidents on mobile phones. The electromechanical device monitors the information as a consequence of the impact by transmitting it to the microprocessor ATmega330Q. GPS of your smart telephone will then communicate with both the satellite to acquire latitude and longitudinal data as well as the incident names will be transmitted to the families, fire departments, etc. which are already defined.

Keywords: RF transmitter; ATmega330P controller; GPS; GSM; Alcohol sensor; Eye sensor; Smoke sensor

Introduction

According to a media report, 80% of road accidents are caused by human mistakes. Statistics across 181 cases indicate that about 1.34 million people per year perish in accidents from 2012 to 2020, with a further 25-30 million people being injured non-fatally [1]. The rate of injury is increased gradually for all generations among peat-pedestrians aged 6 over four times greater than for pedestrians under age 18 [2]. Walkers over 60 years of age are killed in approximately 4 out of 10 car collisions at speeds above 50 minutes [3]. The major goal of this article is to reduce these careless mishaps, thus we suggest a mechanism that regulates the speed of the vehicle without causing any difficulty to the driver. There are times when a vehicle's speed exceeds the intended speed limit or when the driver fails to heed traffic signals. As a result, we employ radio frequency technology.

The Automated Automobile Speed Control (AASC) Systems have been evaluated using RFID Technology [4], which is already built to prevent a fatality. The mechanism of cruise control can retain a default velocity. AASC maintains an established distance between the automobile facing it and the car facing it. Nevertheless, unless the driver reacts, the speed limit cannot be lowered independently by these technologies. The identification of drinking and the prevention of automobile accidents [5] address the sensor for liquor

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in an automobile that detects and smells alcoholic smells and sending signals every five minutes to relatives.

The main aim of this paper is to reduce such thoughtless malfunctions and so we propose a technique to accelerate the car without generating any difficulties for the operator. Sometimes the operator cannot hear indications from the traffic when the car's speed exceeds the planned speed of traffic. We thus use the technique of frequency band.

Block Diagram

In the selected area, the transmitter module is placed. The broadcaster and the recipient both utilize a frequency of 430 MHz. The transmitter receives and sends the data serially to the recipient constantly [6]. Figure 1 shows the transmitter design.

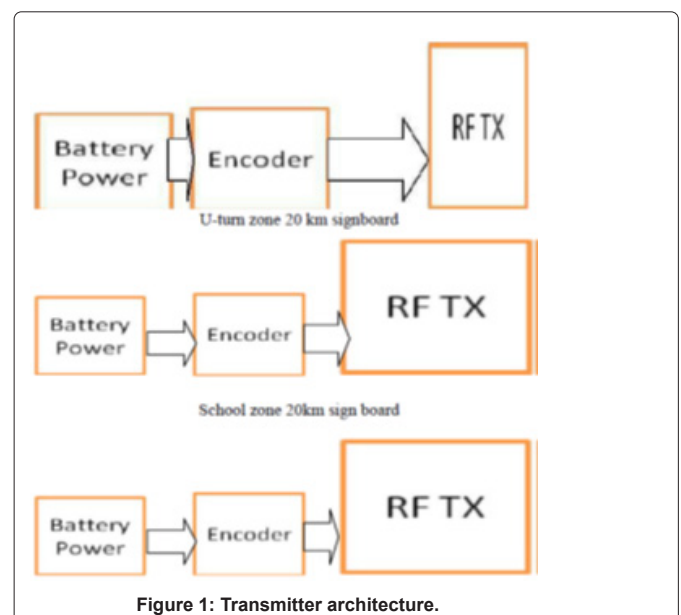
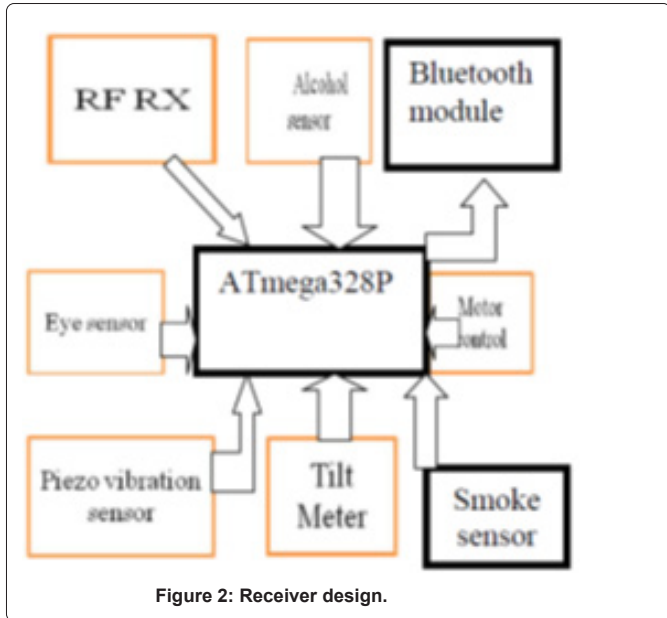


Figure 1: Transmitter architecture.

The design of the recipient design is illustrated in Figure 2. There are two aspects in the Radio Frequency (RF) device: an RF transmitter and an RF receiver. An encoder is available in the transmitters and a decoder is available in the receivers. The transmitter transmits simultaneously transmitted information whereas the processor converts this for reception on the receivers. The microprocessor ATmega330Q is connected to the RF recipient. When it identifies any message with the same wavelength as that of the recipient, the RF recipient alerts the microprocessor that restricts or limits the motion of the car till the area leaves the vehicle. Due to a small range of passive tags, the proposed structure is demonstrated by TVS434 and RWS 434 active RF modules. This gadget has a range of 500 m, adequate for changing throttle position in near real-time [7].

As a consequence, fewer accidents will occur in school and college areas. The three major steps are recognition of the accident, location, and data transfer for help. Certain changes in the surroundings following accidents can be detected by the use of devices that monitor these changeable values. A GSM modem and android phones assist to

pinpoint the location of the vehicle. Due to satellite, GPS information is easily accessible and so this information is sent to mobile telephones via the GSM network regarding the vehicle's position. Information can be transferred via the android app program to the smartphone.



Bluetooth, an eye monitor, and a smoke sensor are interfaced with the computer. The RF recipient module consists of a decoder and a recipient. The information is broadcast by the transmitter's doutpin and received by the recipient's input pin connected to the HT12D decoder's din pin. When the serial data are converted into simultaneous data, then vehicle speed is reduced. The ATmega330Q is linked to the blue tooth module. Data is delivered to Android's smartphone from the GSM module. The messages are transferred to the RX pin of the mobile phone. The cell device includes either GPS or GSM.

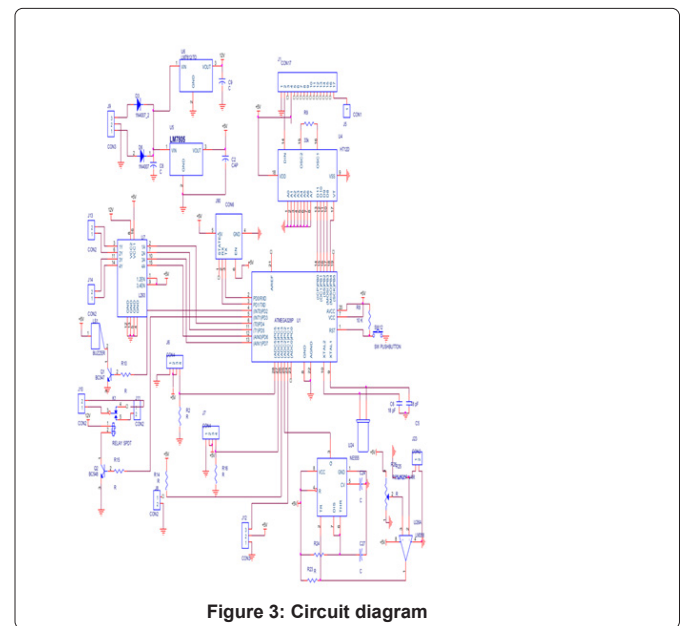
The automobile tilting incidents can indeed be recognized by the use of a detector accelerator (tiltmeter) [8]. The model 335 is a small, low-power accelerometer for tilt areas [9]. From any angle, Tilt is evaluated. For tilt sensations, the gyroscope meter adl 335 is utilized. ADC takes the data of the tilting detector. You can set the program to add 10 ADC values or to remove ten ADC values. Whenever a tilting sensor is configured, a value is often set and an incident happened unless the value reached a specific limit [10]. A piezoelectric's DC output impedance is fairly strong and can be described as a proportional input voltage [11].

The piezo detector is only accessible in elevated/low energies. The alert will disappear, and also the GPS is activated if such an incident happens. A comparator has comparable quality there was an error if the input is higher. If the output produced is insufficient, it is triggered in monostable and increases the power. The GPS value is transmitted to the Rx through the microcontroller when a crash happened. A+5V power distribution system is incorporated. Tension is controlled via the battery voltage LM7905.

System Working Principles

The technology analyses the drivers for both the inclusion procedures when a man sits throughout the vehicle's automobile seat. The sensor determines if the person has a drink or otherwise. The detector MQ3

can recognize liquor in the air of a motorist. The awareness is strong and the reaction time is rapid. The analog output is generated according to the quantity of alcohol drank (Figure 3). The MQ3 alcohol detectors indicate the existence of liquor, if an intoxicated motorist tries to get on the driving seat, and blasts the bell, and will not operate until a regular person repress the inebriated person [12]. The eye detector stops the individual from sleeping in the driver's sitting it will slow down as the automobile enters the area. When there is an accident, the piezoelectric material generates a high correlation coefficient that indicates an accident. The Bike position is determined with the Arduino microcontroller. It connects through Wifi to a smartphone in the event of an accident, a note with GPS and GSM is displayed on Android smartphones. GSM is an established professional platform for electronic telecommunication [13].



Software's Uses

Arduino IDE

The development application integrates an ATmega330Q microprocessor with the Common Languages Programmer and Booter Loader. The Arduino software contains a serial monitor that allows the transmission of simple textual data to and from the Arduino Uno hardware. The software application (Arduino IDE) contains the Zigbee protocol to simplify the use of the I2C bus [14]. Are using the SPI bus to communicate with the universal serial interfaces.

OrCAD

OrCAD is a sophisticated software program for electrical production (EDA). It is utilized for the generation of digital schematics and digital printouts [15]. A range of prototype automation tools, board analyses, and control panel inspections are available to OrCAD PCB designers [16].

MIT app inventor

Mobile applications for android, given by previous google, are presently provided by the California institute of technology. This is a free internet application. This enables us to develop computer science

software applications for the android Operating System (OS). It allows users to design and display performance in different applications on android devices [17].

Conclusion

The paper presented autonomy prevention of accidents through good cleaning, constant speed, and incident detection. The final aim is to build an ATmega330Q microprocessor that could be used for the monitoring of areas on an interconnected solution and to locate the position of the incident immediately and alert all who require knowledge. Since the person involved in the crash cannot supply the information, it should have been readily identified.

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