Accident Prevention System

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Abstract

The population of India has been increasing very fast, which indirectly cause toincrease the vehicle density and lead to many road accidents. The main behind accidents include drunk and driving, use of mobile while driving, collision of vehicle with vehicles or road side obstacles , over speeding etc.

A lot of accidents are happening now-a-days because of increased vehicle numbers, violating traffic rules and carelessness while driving. The objective of this project is to make less road accidents due to drunkdriving which cause the loss of invaluable human life and other valuable goods, to avoid the theft action by making the car password enabled, detecting accidents and thus tracking the vehicle where accident happened for serving emergency medical services to the victim present inside the vehicle.

This project introduce the vehicle alcohol detection, discusses new alcohol detection and control system design and implementation.This project is gift for the society to prevent accidents in this crowded environment. Hope this project is of no doubt to save Precious life.This project uses the Alcohol detection sensor, RFID system for using.

Keywords— RFID system, Alcohol detection sensor, Relay Module

I.INTRODUCTION

It gives an idea about the accident prevention system and vehicle theft system. Nowadays accidents and vehicle theft cases of two-wheelers are increasing at an alarming rate. Speed is the cause of most number of traffic accidents. The number of two-wheelers on the road is more than four-wheelers and eight wheelers. It has been estimated by WHO (World Health Organization) that there is an increase in the number of deaths due to accidents by two wheelers than fourwheelers. Bike-theft is a major problem; several underlying problems have led to this increase in bike-theft. Traditional solution for accident detection uses the Global Positioning System (GPS) to get the location of the accident and a message is sent through a microcontroller or a mobile device. The survey conducted by Government of India during the year 2010, says that there were close to 5 lakh accidents happened, which resulted in more than 1.3 lakh deaths and inflicted injuries on 5.2 lakh persons. These numbers translate into one road accident every minute, and one road accident death every 4 minutes. Over speeding is the main cause when it comes to road accidents in the city. Statistics available with the traffic police shows that nearly 27% of the total accidents are taking place due to over speeding. Exceeding the lawful speed limit is the single biggest reason for road accidents. This led to the creation of accident prevention system where you can access the speed limit.

II. EXISTING SYSTEM

In Existing system there are several ways available to protect persons from accident like airbags, flying parachutes and other things. But all these system works when accident occurs. It not prevents the loss generated from the accident.

Every year lots of vehicles stolen in India. Only few are traced, often in un road worthy condition, with many components missing. These are stolen because the thief is given the opportunity. As a result, The increasing advantages of accident prevention and vehicle theft system now are at highest position thus as a result it provides an estimated and immediate help to the individual.

III. PROPOSED SYSTEM

In accident prevention system we used different types of sensors for accident prevention and avoid vehicle theft. RFID scan is used for the authentication of vehicle. And ultrasonic sensor is used to find distance between vehicle and obstacle and slow down the speed. Also many incident happen because people usually drive while drunk. So the alcohol detection sensor is used detect if the driver is drunk or not ,if driver is drunk then vehicle will not start.

The application for the accident prevention system is useful for the security and enhancing the awareness of the accident prone and theft prone scenarios for the secured and well-being of the individual. One of such system which is of major importance is of providing an immediate notification to the individual and their related people about either of the scenarios and hence prevents them

In other application, if the driver is in a drunken state, the alcohol sensor detects the abnormality by comparing the predetermined values in the microcontroller and the alert message is displayed on the LCD. Meanwhile, the motor gets stopped ant driver is in a safe condition

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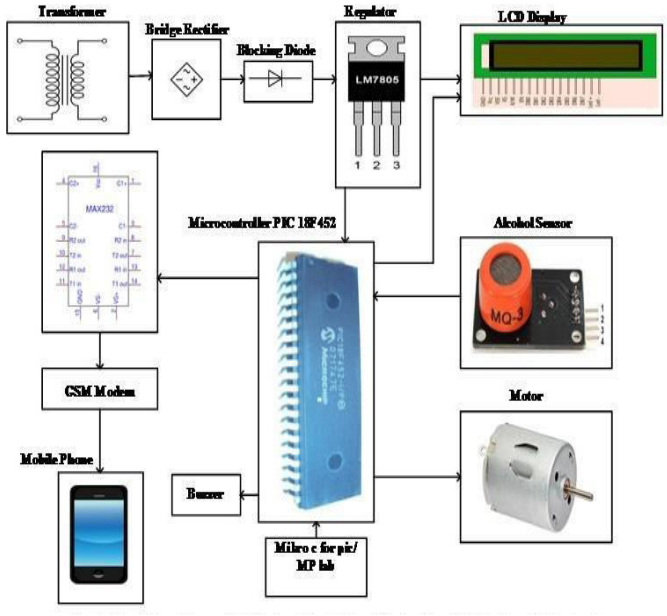

Fig. Architecture of the System

IV. METHODOLOGY

Alcohol sensor is used for accident prevention. Alcohol sensor senses the alcohol content consumed by the driver whereas RFID sensor detect the vehicle user is legitimate user. If both the sensor conditions matches then the motor will start resulting in the engine of vehicle to start else the motor doesn't start. In this we used also the ultrasonic sensor to find distance between obstacle and sensor. So here if the obstacle is found then car automatically slows down. And stop if there is on 10 cm distance remaining.

Components:

Alcohol Sensor:

An alcohol sensor detects the attentiveness of alcohol gas in the air and an analog voltage is an output reading. The sensor can activate at temperatures ranging from -10 to 50° C with a power supply is less than 150 Ma to 5V. The sensing range is from 0.04 mg/L to 4 mg/L, which is suitable for breathalyzers.

Arduino:

The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328P (Arduino Nano 3.x). It has more or less the same functionality of the ArduinoDuemilanove, but in a different package. It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one

RFID :

A radio frequency identification reader (RFID reader) is a device used to gather information from an RFID tag, which is used to track individual objects. ... RFID is a technology similar in theory to bar codes. However, the RFID tag does not have to be scanned directly, nor does it require line-of-sight to a reader.

Relay:

AVTECH's Relay Switch Sensor allows low voltage devices to be turned on/off in response to an event going in or out of an alarm condition. The Relay Switch Sensor is compatible with the Room Alert 4E via a direct connection.

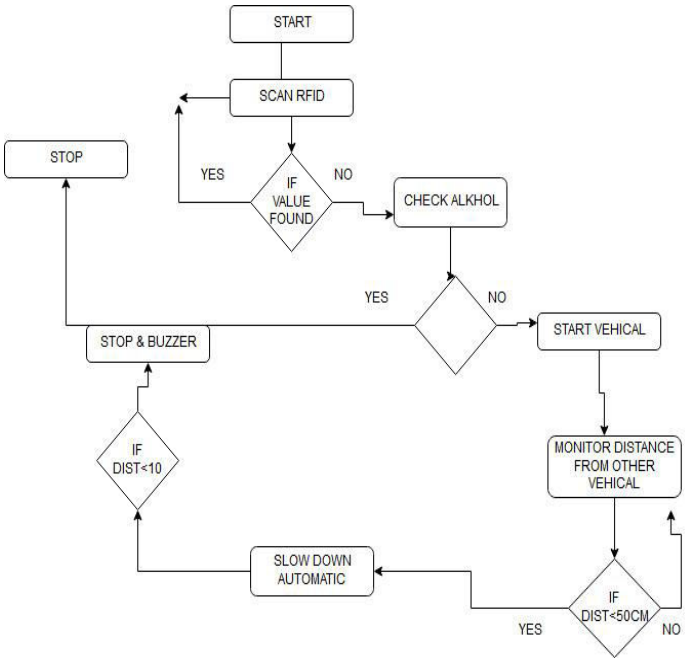

Fig. Flowchart of Accident Prevention System

. In the design of the Automatic toll collection system we haveproposed a spirit sensor, that detect the presence of the alcohols. It can reduce Smuggling of spirit /ganja/alcohol etc. Different alcohol sensor can be used in the system and vehicles are blocked from passing through the toll booth.

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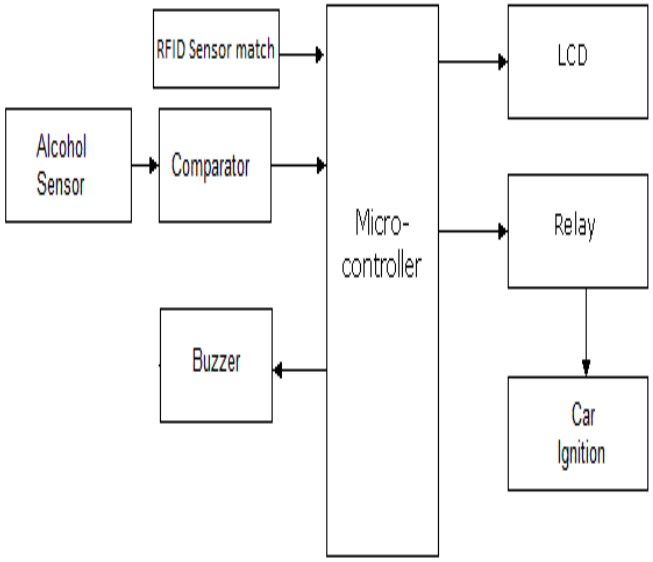

Fig. Block Diagram of the System

User Classes:

Driver:

Driver in the system uses the system and RFID card for login in to the system. After the RFID matches the system the driver is allowed to drive.

System: In the system the we use the RFID sensor to match the details of the driver and system detect the if driver drank the alcohol.

V.IMPLEMENTATION

We have used Hardwaremodel containing several hardware components as well as communication capability.

The major components of this device are:

Hardware Components:

1. Arduinonano controller: The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328P (Arduino Nano 3.x). It has more or less the same functionality of the ArduinoDuemilanove, but in a different package. It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one.
2. Ultrasonic Sensor: Ultrasonic sensors measure distance by using ultrasonic waves. It's head emits an ultrasonic wave and receives the wave reflected back from the target. Ultrasonic Sensors measure the distance to the target by measuring the time between the emission and reception of the waves.
   HC-SR04 Ultrasonic Sensor is used in this system.
3. Motor:We used motor, for braking in case an object is front of the vehicle
4. RFID(Radio-frequency identification): We used RFID which uses electromagnetic fields to automatically identify and track tags attached to objects..
5. Alcohol sensor MQ3:An alcohol sensor detects the attentiveness of alcohol gas in the air and an analog voltage is an output reading.
6. Buzzer: A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke
7. 12v Battery A 12v battery used for power supply

Software Components

ARDUINO IDE:-

Is the required software environment to program the Arduino by writing a code and upload it to the Arduino. It also outputs the results for analysis using both serial monitor and serial plotter. The version used in this project is 1.8.3 (Genuino) which supports both serial monitor to print the HR wave while the serial monitor to print the temperature values

VI. ALGORITHM:

1. System is installed in the car.
2. If RFID Scan not match then driver need to allowed for alcohol detection
3. The device with alcohol detection sensor is used to detect the alcohol
4. If alcohol not detected and RFID matched then the driver is allowed for drive the vehicle
5. If anyone sensor fails then the vehicle will not start.
6. After vehicle started system continuously detect the obstacle and distance between vehicle and obstacle, hence if object come nearer then vehicle slows down speed automatically
7. If distance is 10 cm then vehicle is stopped.

VII. ADVANTAGES

This method of detecting the presence of alcohol in breath is relatively a fast analysis as compared to other methods. The sensors used in this project are smaller in size, not so bulky, hence can be carried.
The project on this technology is complete functionality within itself and thus it is used as a safety system for any vehicle and persons who driving it by preventing the accidents to occur. The system isn't police dependent.
In case if person is drunk, then their family members will drive us safely in that case. Also unauthorized access to the car is restricted and rash driving is not possible.

VIII. CONCLUSION

This project implements the vehicle alcohol detection, discusses new alcohol detection techniques and control system and implementation. In view of the designer's ability and coders ability all the concepts are explained and continued to develop in this system, there are many disadvantages, only in the laboratory test stage, many standards are not mature, but also for the extensionand optimization of the system and the complex problem, need further study.
This project is gift for the society to prevent accidents in this crowded environment. Hope this project is of no doubt to save precious life

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