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Arduino Based Smart College Bus And Student Identification System Using RFID

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***Abstract*—**The ever increasing numbers of traffic accidents all over the world are due to diminished driver's alcohol consumption and improper driving. For this reason, developing system that actively monitors the driver's alcohol detection and near by vehicle distance alerting the driver of any insecure driving condition is essential for accident prevention. In this project we continuously monitor the condition of the driver i.e. whether driver is alcohol is consume or not and monitor near by vehicle distance. If near by vehicle is closes to near by vehicle alerts though voice using voice module. If accident occurs detects by using mercury sensor, micro controller reads the data from GPS Module and send accident location though SMS to police station and Hospital.

Keywords—Arduino UNO, Ultrasonic Sensor, Mercury Sensor, Buzzer, GSM Module, GPS Module, RFID Scanner, Alcohol Sensor, Voice Processor, LCD Display etc….

I. INTRODUCTION

- The ever increasing numbers of traffic accidents all over the world are due to diminished driver's alcohol consumption and improper driving. For this reason, developing system that actively monitors the driver's alcohol detection and near by vehicle distance alerting the driver of any insecure driving condition is essential for accident prevention. In this project we continuously monitor the condition of the driver i.e. whether driver is alcohol is consume or not and monitor near by vehicle distance.
- If near by vehicle is closes to near by vehicle alerts though voice using voice module. If accident occurs detects by using mercury sensor, micro controller reads the data from GPS Module and send accident location though SMS to college management, police station and Hospital.

When students board the bus, the RFID Based Tracking System will notify you via text message. You will also get notified when your student enters and leaves college.

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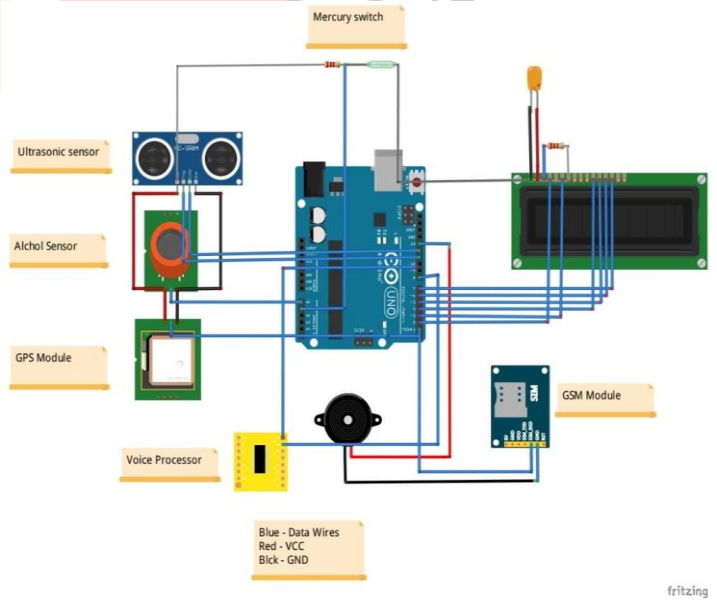


Fig 1:Hardware Design

II. RELATEDWORK

Automatic Drunken Drive

Avoiding System

By RubenaAafreen

- This system is basically a combination of both software and hardware which can perform some specific functions using microcontroller Avr-ATmega16.
- The alcohol sensor, on detecting the alcohol concentration will give the analog resistive output to the microcontroller, then further alcohol detection message is displayed on the LCD. we have set a particular threshold concentration.

Vehicle Collision Avoidance System

By Dr. Madhu, Karthik koti

- A collision avoidance system, also known as a pre-crash system, forward collision warning system, or collision mitigating system, is an automobile safety system designed to prevent or reduce the severity of a collision….

Automatic Vehicle Speed Control System

By Shubangi Sanjay Bhargave

- Vehicle Speed Control System isdesigned to control the speed of the vehicle in specificzones to avoid the accidents in the low speed areas. In thissystem the low speed zone is considered to be the 100meter earlier to the traffic signal.

Fully Automated Cruise Control System Using Ultrasonic Sensor

By R.Harish Madhan and Kavi Priya

- This is an electronic system that allows the vehicle to slow while approaching another vehicle and accelerate again to the preset speed when traffic is cleared.
- it also warns the driver or applies brake if there is a way.Heusedanall-encompassingcamera.LRFwasalsoincludedintheproposalbyhim[10].Wilhelminvestigatedthetopic of a specific person's skin tone. During the investigation,healso useddatafromothersensors[11].

III. SYSTEMCOMPONENTS

This Arduino Based Smart College Bus And Student

Identification System Using RFID has

- Arduino UNO
- GPS Module
- GSM Module
- UltraSonic Sensor
- Buzzer
- RFID Scanner
- Voice Processor
- LCD Display

IV. MODEL OF THE SYSTEM

- A deliberate approach to research is taken with the goal ofcreating a fully autonomous and functional System.

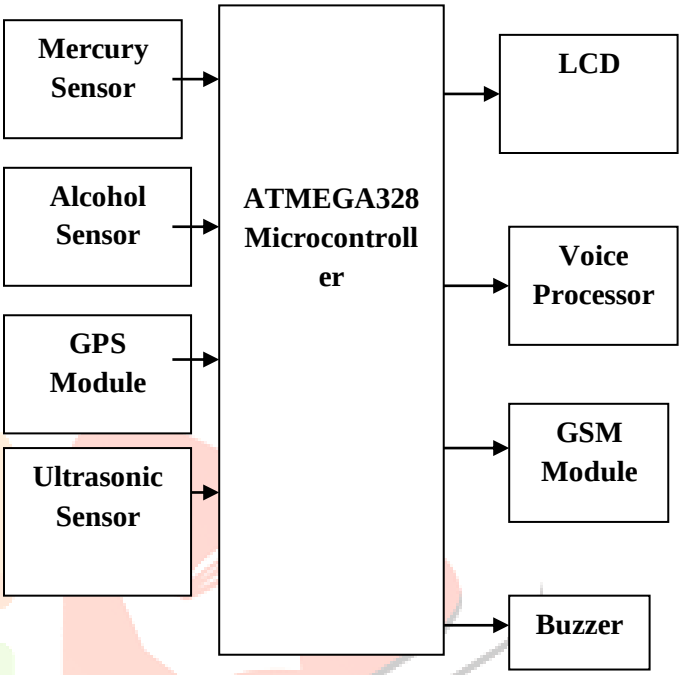
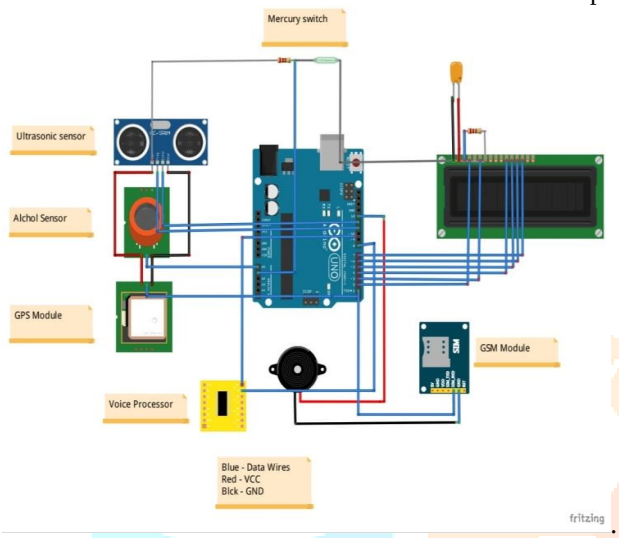


Fig 2: Model Of The System

V. SYSTEM DESIGN

- The total system is based of Microcontroller Arduino. Here Arduino is our main controlling unit. After receiving the data from the sensors and GPS module it first fetches the data than decode the data and finally execute its operation. Here in Fig.1 shows the circuit diagram of the designed system where Arduino which is the main microcontroller unit is connected with Ultrasonic Sensor, Alcohol Sensor, Mercury Sensor, GPS module, GSM module, RFID card module, LCD display, and Voice processor



A. Arduino :

- There are numerous different microcontrollers and microcontroller platforms accessible for physical computing. Parallax Basic Stamp, Netmedia's BX-24, Phidgets, MIT's Handyboard, and numerous others offer comparative usefulness. These apparatuses take the chaotic subtle elements of microcontroller programming and wrap it up in a simple to-utilize bundle. Arduino additionally rearranges the methodology of working with microcontrollers; moreover it offers some advantages for instructors, students, and intrigued individuals: • Inexpensive - Arduino boards are moderately cheap compared with other microcontroller boards. The cheapest version of the Arduino module can be amassed by hand, and even the preassembled Arduino modules cost short of what $50. • Cross-platform - The Arduino programming runs multiple operating systems Windows, Macintosh OSX, and Linux working frameworks. So we conclude that Arduino has an advantage as most microcontroller frameworks are constrained to Windows. • Straightforward, clear programming method – TheArduino programming environment is easy to use for novices, yet sufficiently versatile for cutting edge customers to adventure as well. For educators, its favorably engaged around the Processing programming environment, so understudies finding ways to understand how to program in that environment will be familiar with the nature of arduino.

B. UltraSonic Sensor:

Ultrasonic sensors (also known as transceivers when they both send and receive) work on a principle similar to radar or sonar which evaluate attributes of a target by interpreting the echoes from radio or sound waves respectively. Ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor. Sensors calculate the time interval between sending the signal and receiving the echo to determine the distance to an object.

C. Mercury Sensor:

Mercury switches have one or more sets of electrical contacts in a sealed glass envelope which contains a bead of mercury. The envelope may also contain air, an inert gas, or a vacuum. Gravity is constantly pulling the drop of mercury to the lowest point in the envelope. When the switch is tilted in the appropriate direction, the mercury touches a set of contacts, thus completing the electrical circuit through those contacts. Tilting the switch the opposite direction causes the mercury to move away from that set of contacts, thus breaking that circuit. The switch may contain multiple sets of contacts, closing different sets at different angles, allowing, for example, single-pole, double-throw operation.

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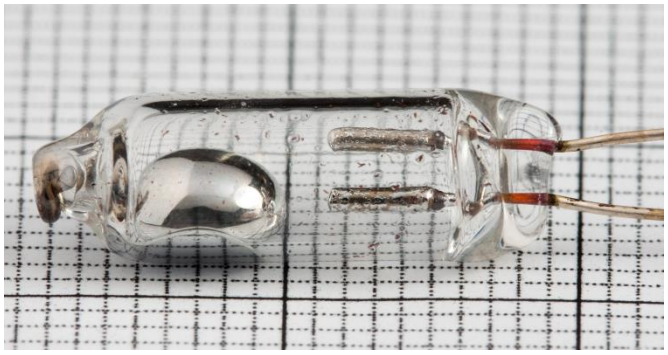

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D.RFID :

- RFID Based Tracking facilitates you in ensuring the safety of student. When students board the bus, the RFID Based Tracking System will notify you via text message. You will also get notified when your student enters and leaves college. Furthermore, the bus is constantly being monitored. This Tracking System will notify via text message for management also….
- Radio Frequency Identification (RFID) is a type of passive wireless technology that allows for tracking or matching of an item or individual.

E. Alcohol Sensor:

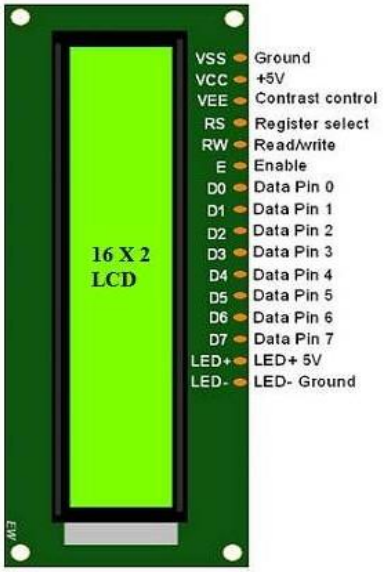
- The alcohol sensor is technically referred to as a MQ3 sensor which detects ethanol in the air. When a drunk person breathes near the alcohol sensor it detects the ethanol in his breathe and provides an output based on alcohol concentration. If there is more alcohol concentration more LED's would lit.The concentration sensing range of **0.04 mg/L to 4 mg/L** is suitable for alcohol sensors (the legal limit of breath alcohol concentration, or BrAC, in most US states is 0.08 grams per 210 liters, or 0.38 mg/L). The sensor can operate at temperatures from -10 to 50°C and consumes less than 150 mA at 5 V.

F. GPS Module:

The Global Positioning System (GPS) is a satellite-based navigation system that sends and receives radio signals. A GPS receiver acquires these signals and provides you with information. Using GPS technology, you can determine location, velocity, and time, 24 hours a day, in any weather conditions anywhere in the world—for free. GPS, formally known as the NAVSTAR (Navigation Satellite Timing and Ranging). Global Positioning System originally was developed for the military. Because of its popular navigation capabilities and because you can access GPS technology using small, inexpensive equipment, the government made the system available for civilian use. The USA owns GPS technology and the Department of Defense maintains it.

H. LIQUID CRYSTAL DISPLAY(LCD):

- 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 diodes and seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations for displaying custom characters, special and even animations, etc.

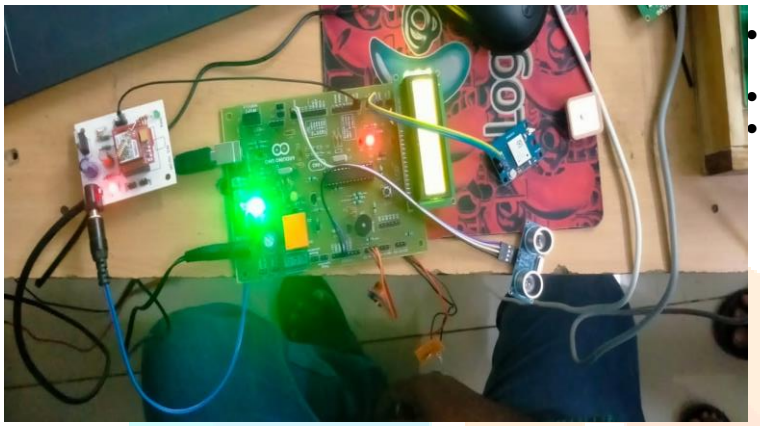


G.GSM Module:

- GSM module from Sim com that gives any microcontroller GSM functionality, meaning it can connect to the mobile network to receive calls and send and receive text messages, and also connect to the internet using GPRS, TCP, or IP. Another advantage is that the board makes use of existing mobile

VI. RESULT ANALYSIS

- Here in Fig. 12 the implemented hardware circuit is shown. GSM Module and GPS Module are connected through the serial communication with Arduino. For driving all the circuit we used a 0vto5v power supply.



VII. APPLICATIONS

- RFID Identification system can be used in schools, colleges, offices etc.. to identify the particular person.
- Vehicle communication can be used in all types of vehicles .
- It can be used for alcohol detection of drivers

CONCLUSION

The Arduino based smart college bus and student identification using RFID is very sufficient and worthy to be implemented in the vehicle, especially in developing countries like .The accident is increasing due to the increase in the number of vehicles, as a result, every year the number of death is increasing. This prevents uncertain death after an accident because this system sends the message alert to the hospital or police station. The message alert includes longitude, and latitude (location of accident), in the form of a google map link. A Unique RFID card gets detected when the student entering or leaving the bus and that information is sent to the respective college management. They can trace their student using their Unique Tracking ID.

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