An Efficient & Autonomous Child Safety & Accident Detection Devices For Vehicle

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Abstract- *Now a day's people are very busy in doing their works due to that sometimes they forgot the parking places with their child. Sometimes police may catch the car without knowing the person present inside. My project is helpful in that situation it will indicate to the outer people whenever child is present inside using PIR sensor. And it also monitors the temperature conditions present inside the vehicle. If unexpectedly the police lift the car it will intimate to the user using GSM based mobile communication and also it will detect the accident using ultrasonic sensors and intimate to the described authority.*

Keywords- PIR sensor, Ultrasonic sensor, Temperature sensor, LED, LCD MODULE (2X16CHARACTER), GSM Network, Crystal oscillator , Embedded C, Arduino IDE.

I. INTRODUCTION

Embedded systems are electronic devices that **incorporate** microprocessors with in Their implementations. The main purposes of the microprocessors are to simplify the system design and provide flexibility. Having a microprocessor in the device means that removing the bugs, making modifications, or adding new features are only matters of rewriting the software that controls the device. Or in other words embedded computer systems are electronic systems that applications. The computer is hidden inside these products. Embedded systems are ubiquitous. Every week millions of tiny computer chips come pouring out of factories finding their way into our everyday products. Embedded systems are self-contained programs that are embedded within a piece of hardware. Whereas a regular computer has many different applications and software that can be applied to various tasks, embedded systems are usually set to a specific task that cannot be altered without physically manipulating the circuitry. Another way to think of an embedded system is as a computer system that is created with optimal efficiency, thereby allowing it to complete specific functions as quickly as possible.

II. CHILD SAFETY AND ACCIDENT DETECTION DEVICE

Child safety and accidents device detects the temperature ranges inside car when it was at sunlight using temperature sensor, PIR sensor continuously monitor whether the people present inside car or not, it will give alert indication using led bulb attached to it while people present inside car. If police life the car this device intimate user in the form of message using GSM module. Accelerometer sensor detects the direction of car. If unfortunately car met with an accident GSM device intimate family members in the form of message.

III. SYSTEM MODULE

PIR Sensor :A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. They are most often used in PIR-based motion detectors. PIR sensors are commonly used in security alarms and automatic lighting applications.

PIR sensors detect general movement, but do not give information on who or what moved. For that purpose, an imaging IR sensor is required.

PIR sensors are commonly called simply "PIR", or sometimes "PID", for "passive infrared detector". The term passive refers to the fact that PIR devices do not radiate energy for detection purposes. They work entirely by detecting infrared radiation (radiant heat) emitted by or reflected from objects.

GSM (GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS) :

GSM is a cellular network, which means that mobile phones connect to it by searching for cells in the immediate vicinity. GSM networks operate in four different frequency ranges. Most GSM networks operate in the 900 MHz or 1800 MHz bands.

GSM-900 uses 890–915 MHz to send information from the mobile station to the base station (uplink) and 935–960MHz for the other direction (downlink), providing 124 RF channels (channel numbers 1 to 124) spaced at 200 kHz. Duplex spacing of 45 MHz is used. It uses TDMA frame. Half rate channels use alternate frames in the same timeslot. The channel data rate is 270.833 k bit/s, and the frame duration is 4.615ms.

LCD MODULE (2X16CHARACTER): Dot matrix LCD modules is used for display the parameters and fault condition.16 characters 2 lines display is used. It has controller which interface data's and LCD panel. Liquid crystal displays (LCD's) have materials, which combine the properties of both liquids and crystals. Rather than having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered form similar to a crystal. An LCD consists of two glass panels, with the liquid crystal material sandwiched in between them. The inner surface of the glass plates are coated with transparent electrodes which define the character, symbols or patterns to be displayed polymeric layers are present in between the electrodes and the liquid crystal molecules to maintain a defined orientation angle.

IV. WORKING

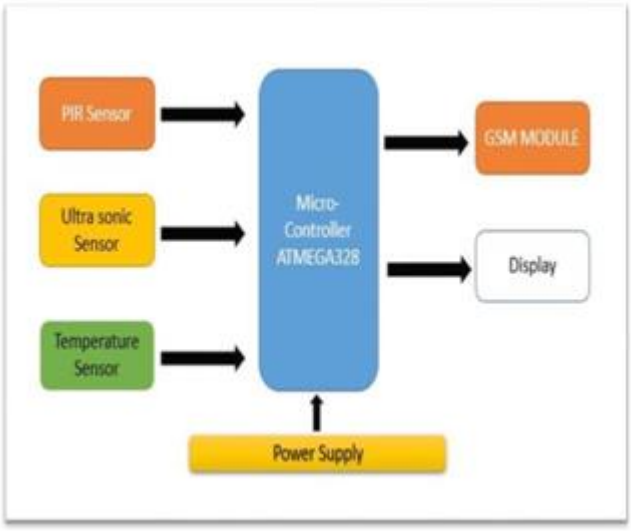

Figure : Block diagram of proposed system

Block diagram consists of Atmega328 micro controller, Power supply, crystal oscillator, capacitor, Temperature Sensor, Ultra Sonic Sensor, LED, PIR sensor, 16X2 LCD Display and GSM module which is used to send the data to the suer basedonspecifiedconditions.Inourproposedsystem we have PIR sensor based Human detection technology. Will detect the humans whether they are present inside the vehicle. Will intimate to outside using RED LED light placed at the Front glass. We are adding a ultrasonic sensor will detect the distance of the car from the earth. If it will changes the limit immediately sends the message to the user.In this system we are also placing temperature sensor will detects the temperature conditions inside the vehicle in all the time if it will changes the limits sends the alert message to the user.

V. RESULTS

Below figure shows the result of an efficient & autonomous child safety and accident detection device sending message from GSM module to user device on various conditions.

Result (a):-

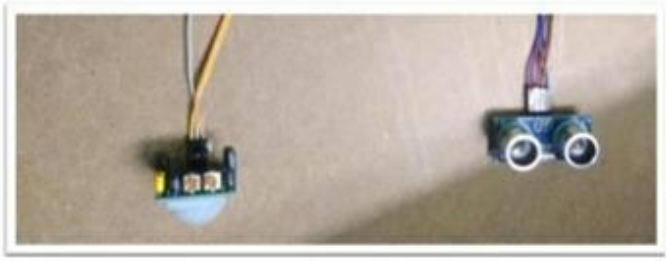

Fig:-PIR sensor and Ultrasonic Sensor detections

We can see these values in the LCD 16X2 Display attached to it.as shown in the below figures when the human detected by sensor and car to road distance.

Result (b):-

Fig:- PIR Sensor Detects human

. Whenever device is in ON condition then it will continuously checks for human using PIRsensor attached to it and also checks the distance from the road to car based On ultrasonic sensor attached toit.

When ever human is present then the device will turn on the red led attached to it for altering people

Fig :- car lifted and human present condition display

Result (c):- Whenever the car lifted and no human is present then it will intimate to the user by sending the message using GSM module and also shows the message in LCD 16X2 Display.

fig :- car lift no human condition

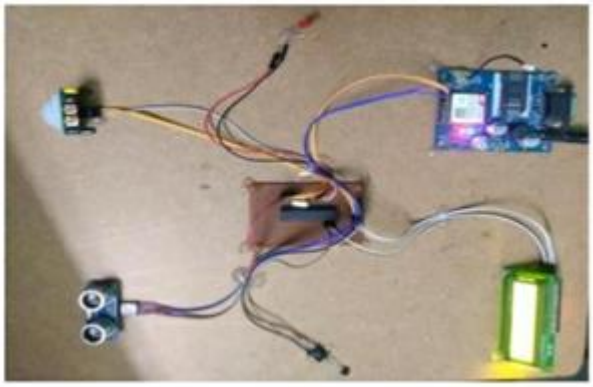

fig :- car lift no human condition display

Result (d):-

Whenever the human/child present inside the car andcar may got lift then it will alerts based on the led, shows the message in display and also sends the message to the user.

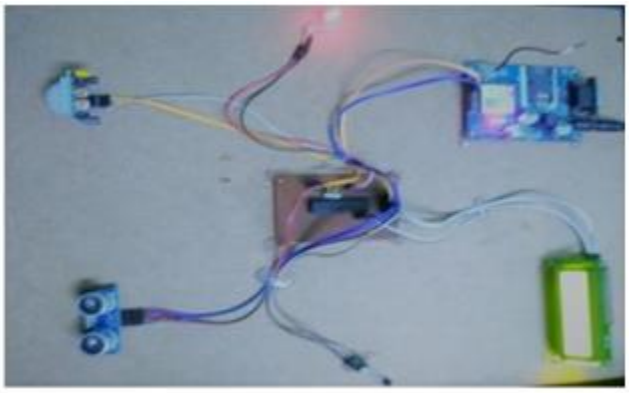

Fig :- car lifted and human present condition display

Result(e):-

Whenever the human/child present inside the car and car may not lift then it will just alerts based on the led,and only shows the message in display as human present and it does not also sends the message to the user.

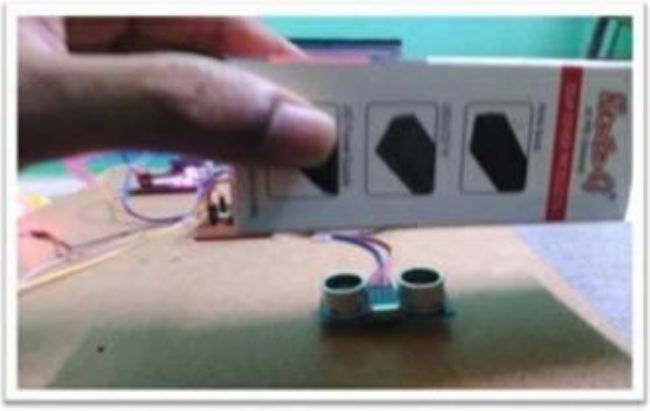

Fig :- car not lifted human in present condition.

Distance is about 3 centimetres

Fig :- Distance from ultrasonic sensor

Result (f):-

Fig :- Human detected by PIR Sensor

In this device we have an advanced feature that it will also detects the temperature ranges inside the vehicle using LM35 Temperature sensor. If the temperature is high it will also alert the user based on LCD display and in SMS.
temperature in the car is 31.23 Celsius degrees.

Fig: Car temperature Detection Condition Display

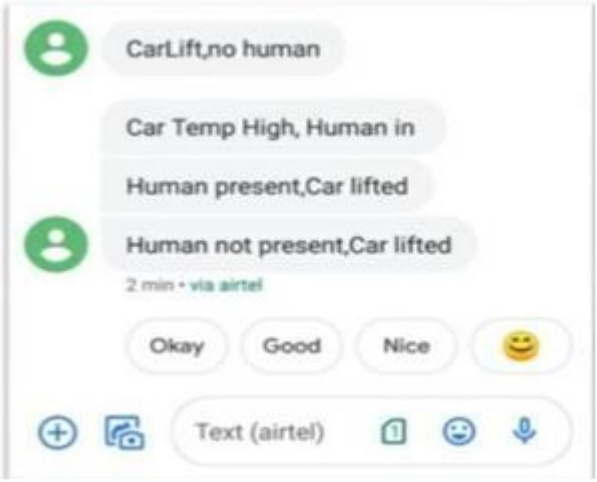

Fig: Messages from GSM module to user on various conditions

VI. CONCLUSION

Our developed system has a capability to check the people present inside the car or not, whether the car is present in good condition or lifted by traffic police vehicle and finally the temperature ranges inside the car.

- This project is a simple device can easily install can monitor the persons presence efficiently.
- By using this device, we can perform different tasks from the autonomous device operation.
- By this device we can save over money and damages to the people while they are in vehicle.
- This device can also be used for any type of vehicles for detection purpose.

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