Smart Accident Notification and Collision Avoidance System

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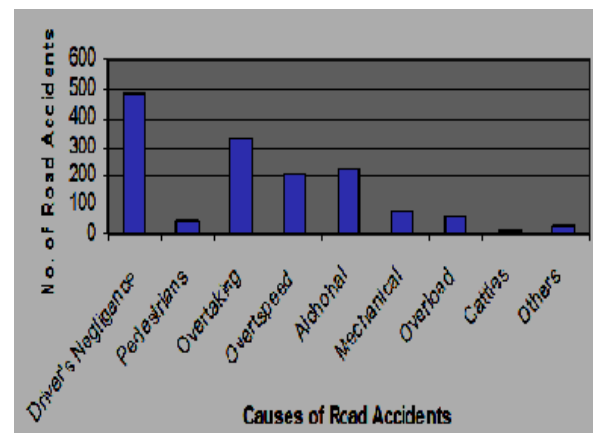Sri Ramakrishna Engineering College
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Abstract- Accidents are the main threat in today's modern world. All though the technological development in automobiles increases day by day, there are no proper advancements in the perspective of accident avoidance and detection before head. This project completely covers the whole system from accident avoidance, detection and the necessary measures to be taken after the accident. By implementing this useful system in every automobile the mortality rate can be reduced up to 90%.It also aims to make driving possible even for the acoustically challenged. At present, there are systems to detect the accidents occurring due to adverse weather conditions and provide necessary aids to the victims affected by such accidents. This system avoids accidents due to collisions occurring between the vehicles because of the driver's negligence. In case of any accidents, there is smart rescue system in the vehicle which helps in sending the location of accident spot to the nearest hospital. While taking the victim to the hospital the smart life saver equipment will update the current health status of the person and sends the details to the hospital so that necessary arrangements are made for the treatment before the arrival of the victim.

Keywords-Smart Rescue System, Smart Life Saver Equipment.

I.INTRODUCTION

Advances in Technology have taken place at such a speed that these fictitious scenario are likely to be translated into reality very soon in a couple of years. Embedded Systems or Electronics systems include an application Specific Integrated Circuit or a Microcontroller to perform a specific dedicated application**.** It is cooperating with the rest of the components to achieve some overall function. With the help of such embedded processor this project is implemented that mainly helps to bar the loss of human lives due to accidents. Accidents occur as a result of many factors, among which one of the major reasons is the negligence of drivers.

Causes of Road Accidents

By observing above chart we are able to conclude that there are three dominant causes of road accidents-Negligence, Overtaking, Use of alcohols are related to driver. It is clearly understood that most of the accidents occur as a result of driver's negligence as revealed from the above graph.This project mainly focuses in reducing the road traffic injuries by preventing the accidents to a greater extent. In case of anyaccident, the victim should be rescued and treated as soon as possible.

II.EXISTING SYSTEM

Currently there are only few technologies for accident detection. As it is done manually there is loss of life in golden hours. The accident victim is dependent on the mercy of others to rush him to hospital. Many a times an accident goes unnoticed for hours before help comes in. Due to all these factors there is a high rate of mortality of the accident victims. Few existing systems to avoid road accidents include antilock braking system, Electronic brake-force distribution, Supplemental restraint system airbags, Immobilizer, Parking sensors, Cruise control.

DRAWBACKS OF EXISTING SYSTEM:

- From previous works, it is noticed that steps have not been taken to improve the assistance to injured passengers.
- It is also noteworthy that existing proposals in the literature are trying to estimate the severity of a traffic accident but do not develop a complete automated system for accident avoidance, detection and necessary measures to be taken after the occurrence of accidents.

- There are no systems to make driving possible for acoustically challenged people.

III. PROPOSED SYSTEM

The main goal of this system is to reduce the mortality rate by providing quick medication to the victims of road accidents. Though it is hard to completely prevent accidents, few steps can be taken to prevent it beforehand. One such mechanism is to quickly detect the dangerous situations and alert the driver.Such mechanism is carried out in this project by displaying an alert message on the screen. In case if accident occurs due to driver's negligence, then this system also provides the necessary steps to be taken after the accident. The immediate step to be taken after the accident is to locate the spot where the collision has occurred. The information regarding that accident should be sent to a main server which keeps track of the hospital locations. A smart rescue system which consists GPS and ZIGBEE module in the concerned vehicle will send the location of the accident to the main server which will rush an ambulance from a nearest hospital to the accident spot.A smart life saver equipment in the ambulance will send the vital parameters of the patient to the concerned hospital.
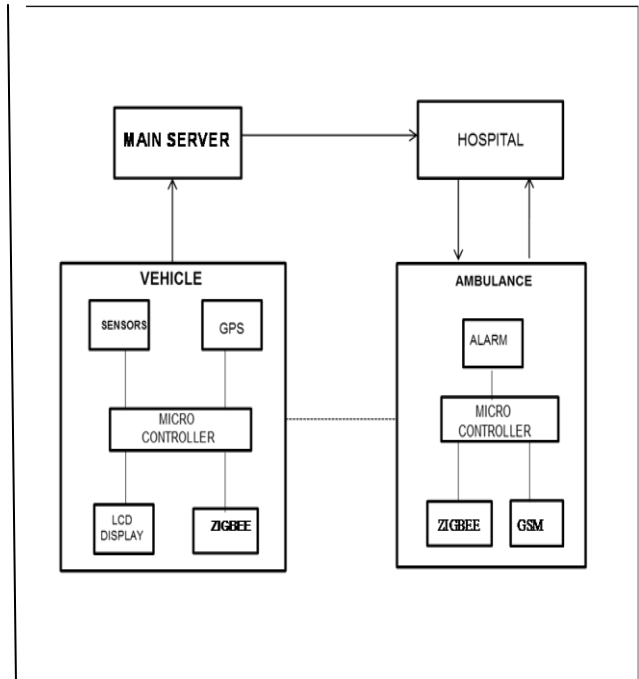
This system is fully automated, thus it finds the accident spot updates the patient status to the hospital, which ensures faster treatment for the victim. The system modules include:

- **Collision Avoidance:** This system avoids accidents due to collisions occurring between the vehicles because of the driver's negligence.
- **Accident Notification:** In case of any accidents, there is smart rescue system in the vehicle which helps in sending the location of accident spot to the nearest hospital
- **Faster Rescue System:** While taking the victim to the hospital the smart life saver equipment will update the current health status of the person and sends the details to the hospital so that necessary arrangementsare made for the treatment before the arrival of the victim.

The system consists of three main units, which coordinate with each other and make sure that the ambulance reaches the hospital without any time lag. Thus our system is divided into following three units:

1. Vehicle unit
2. Ambulance unit
3. Control unit

The overall block diagram for the proposed project is given as follows.

1. Vehicle unit

For implementation of this project, vehicle unit should be installed in every vehicle .It consists of microcontroller along with the ac GPS and ZIGBEE modules and sensors to sense the accident. On impact on the vehicle, information about accident is send to the main server. This information consists of the location of accident detected by GPS module installed in vehicle. The GPS system finds out current position of vehicle (latitude and longitude) which is the location of accident spot and gives that data to server. This information to the main server is conveyed by ZIGBEE module.

2. Control unit:
Control unit is the brain of our system. Practically, the control unit will house all the database of all the nearest hospitals in order to send an ambulance to the accident spot. It receives the message about accident location from the GPS and ZIGBEE module installed in vehicle unit and responds accordingly.

3. Ambulance unit:
Control unit sends the ambulance to the accident location. Ambulance collects the victim from the accident location. While in the ambulance the vital parameters of the patient temperature and pulse rate are continuously monitored and conveyed to the concerned hospital. We are using LM35 temperature sensor whose output voltage is linearly proportional to the Celsius (centigrade).For measuring
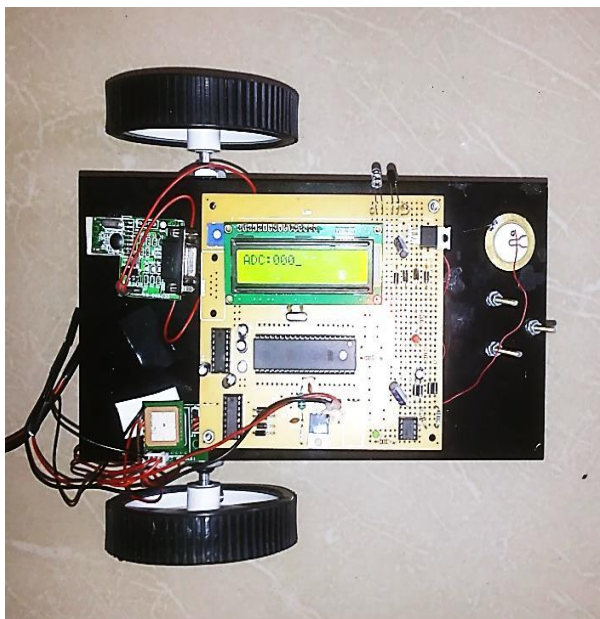
pulse rate we are using IR based obstacle sensor. These details are updated to the hospital with the help of GSM module as soon as the victim is rescued
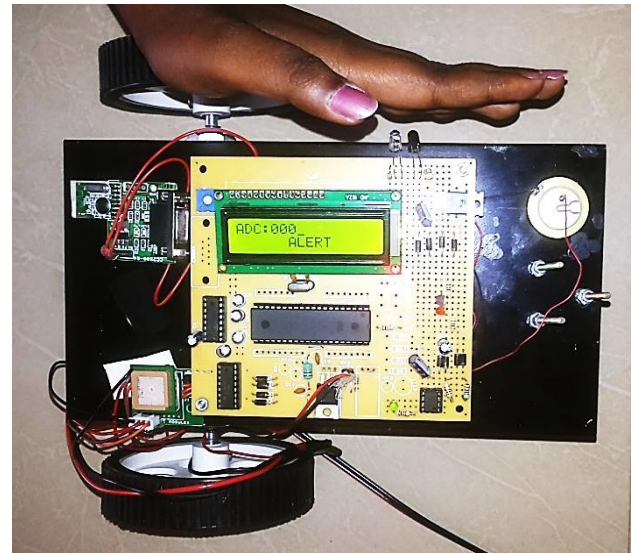
ADVANTAGES

•   The main advantage of this project is the overall mortality rates and unnecessary deaths can be brought under control.

•   By implementing this useful system, driving is made possible for acoustically challenged people.

•   The immediate medication will be provided to the victims of the accidents in remote areas.

IV EXPERIMENTAL RESULTS

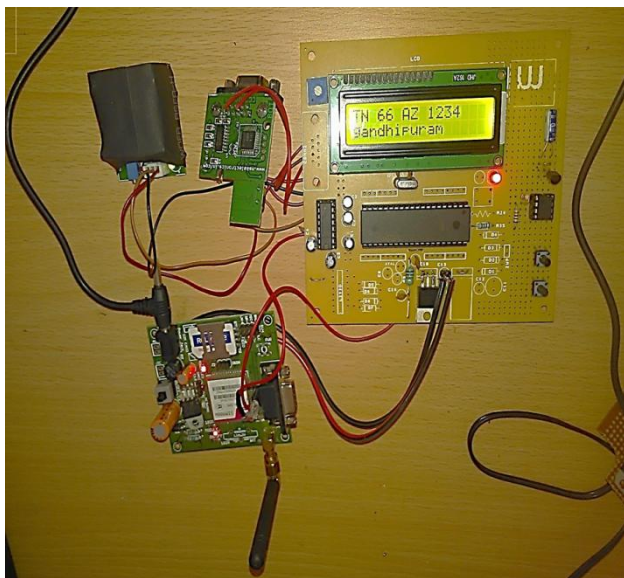This module represents the basic model of a vehicle unit used in this project.

In the vehicle unit, a warning or notification is given when there is any obstacle or if possibility of accident to occur is more. This proves to be useful for acoustically challenged drivers.
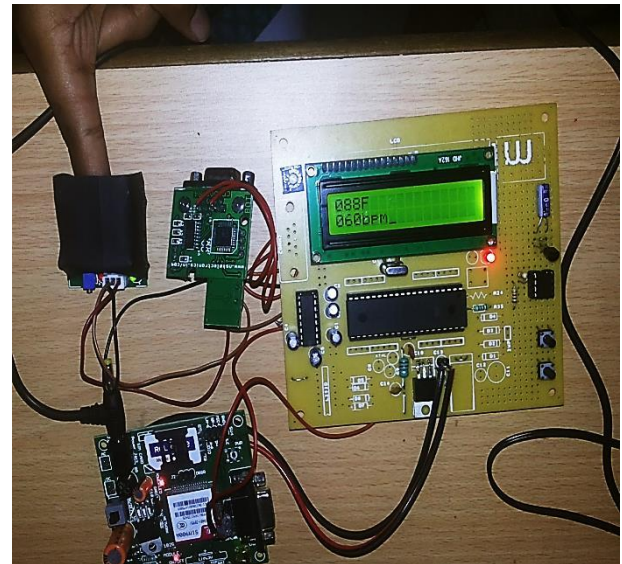

Incase if the accident occurs, then it is intimated automatically to the main server which involves in smart rescue operation.The front end of VB (I) is shown below. This highlights the location of the accident spot by tracking the latitude and longitude along with the vehicle number.

The location can be obtained by decoding the magnitude of latitude and longitude using GPS decoder after which the notification regarding the accident is intimated to ambulance automatically. The front-End of VB (II) appears as shown in the figure.
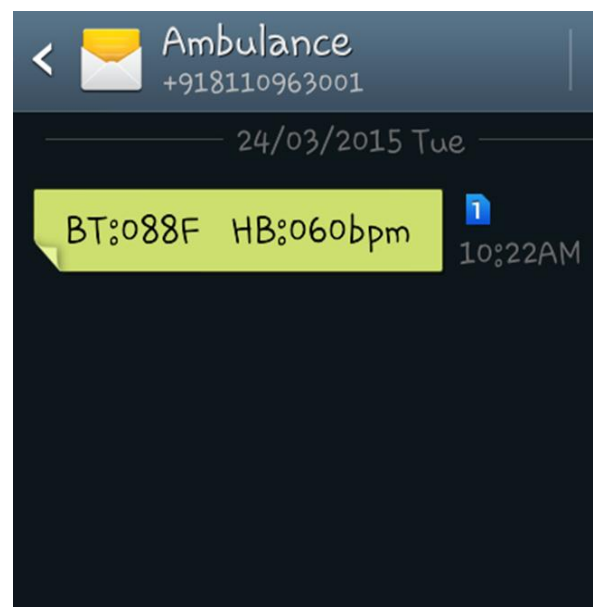
The ambulance module appears as given below. The ambulance receives the information regarding the location of accident spot, the vehicle number and arrives to the corresponding location.

Once when the victim is rescued, the smart life saver equipment in the ambulance measures the heart rate and the body temperature of the victim.

The status message of the patient will be received by the hospital.The data send to the hospital are body temperature (BT) and heart beat (HB) of the particular victim. The units measuring the physical quantities are Fahrenheit and beats per minute respectively.

V.CONCLUSION

As far as mortality rate is considered, a major percent of deaths occur as a result of accidents. In this project the overall system to avoid collision at the initial stage has been developed. Moreover if unavoidable accidents occur, the automatic Smart Rescue system and Smart Lifesaver equipment will ensure that the lives of victims are saved to a greater extent

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