



Sensor Based Health Monitoring System for Driver Using Wireless Communication

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ABSTRACT: In this paper the main objective is to design a simple model that continuously monitors the driver's health status. The proposed system monitors heart beat, body temperature, breathe rate of the driver. In addition to the above parameters alcoholic sensor is used which detects whether the driver is alcoholic or not and an eye blinking sensor is used to monitor whether the driver is sleeping. The values of all parameters are displayed on the LCD screen and a buzzer is activated if the driver is alcoholic or drowsy. During abnormal conditions, the health status of driver is informed to transport company of driver and to near by hospital.

KEYWORDS: driver health, monitoring, alarming, communicating,

I.INTRODUCTION

Recent studies prove that road accidents occur mostly due to driver's ill health and inattention so health care monitoring system for drivers is given more importance in order to reduce increasing accidents. It will be useful if smart health care monitoring system is available at an affordable price. Thus, here is the system which continuously monitors the person's health parameters such as oxygen saturation, blood pressure, pulse rate, body temperature (1,2). And the system also checks whether the driver is alcoholic or not by using appropriate biosensors (3,5). And also an eye blinking sensor is used to detect whether the driver is sleepy. In this system the monitored values are compared with the preset values of (oxygen, pulse rate, body temperature) these parameters. In case of any significant difference in the values, the abnormality is displayed on LCD and if the person is detected as alcoholic or drowsy an alarm is activated in the vehicle (4, 7). During these abnormality conditions the status of health is communicated to nearby hospital for ambulance and message is sent to the transport office using GSM and GPS modules (9, 10, and 11). The efficiency of the system in the proposed model is high comparably. There are few systems in which transmitters are used that will interface with other electrical equipment because of this interfacing efficiency of transmission and receiving is affected, so in proposed system it is reduced by using GSM and GPS module and this is also useful in communicating longer distances. This paper is organized into seven sections. First section deals with Introduction and followed by Wearable Biosensors, Communication system, System block diagram, Simulation, Hardware Implementation and Conclusion.

II. WEARABLE BIOSENSORS

There are many medical bio sensors which detect particular values so these sensors are placed on the human body and collect the necessary readings from the human body. Then the information collected is sent to the main controller. This main controller is responsible for transmitting human's health status to the required locations. The wearable sensors used in this model are-

a) HEARTBEAT SENSOR:

Heart beat can be sensed by using a high intensity type LED & LDR. The finger is placed between LED & LDR. The block diagram of heart beat sensor is shown in fig(1). Photodiodes or phototransistors can be used as sensors. The skin may be illuminated with visible red light using transmitted or reflected light for detection. The very small changes in reflectivity caused by the varying blood content of human tissue are almost invisible. This setup consists red LED for transmitted light and LDR as detector with only slight changes in the pre amplifier circuit the same hardware and software can be used with other illumination and detection concept. The actual heart beat sensor is shown in fig(2). The detector's photo current is converted to voltage and amplified by an operational amplifier output is given to another non

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inverting input of same amplifier and hence second amplification is done. The value is already preset in the inverting input. The amplified value is compared with the preset value. If any abnormal condition occurs it will generate an interrupt to the controller.

Fig (1)

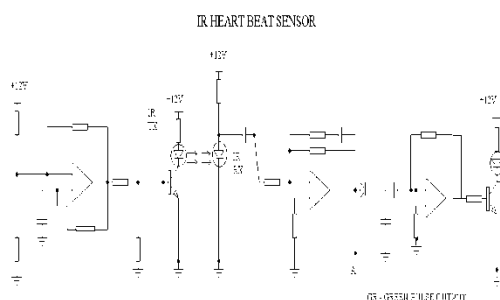


Fig (2)



b) TEMPERATURE SENSOR:

Temperature sensor is a device which senses variation in temperature across it. LM35 is the basic temperature sensor that can be used for experimental purpose and it shown in the fig(3). It gives the reading in centigrade since its output voltage is linearly proportional to temperature. It uses the fact that as temperature increases the voltage across diode increases at known rate.

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Fig (3)



c) ALCOHOL SENSOR:

The sensor which is used to detect the presence of alcohol vapors is called alcohol sensor or gas sensor. This sensor unit offers very high sensitivity combined with fast response time. The gas sensor MK6 which is shown in fig (4) offers excellent stability with long life when all the acetic acid is cleared out of the fuel cell, the instrument is read to analyze another sample.

Fig (4)



d) EYE BLINKING SENSOR

Scope of this eye blinking sensor is as driver cannot care the vehicle during less conscious so if we done all the vehicles with automatic security that provides high security to driver and gives alarm. Function of the eye blinking sensor is IR based. The variation across the eye will vary as per as per eye blink if the eye is closed means the output is high otherwise output is low. This will help to know the eye is closing or opening position. This output is given to logic circuit to indicate the alarm. Fig(5) shows the sensor which is used in the proposed model.

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Fig (5)



e) OXYGEN SENSOR

An oxygen sensor is an electronic device that measures the proportion of oxygen in gas or liquid being analyzed. The original sensing element is made with the zirconia ceramic coated on both sides. There are many in measuring oxygen which includes infrared ultrasonic and lazer methods. Each method is having its own advantages and disadvantages. Fig(6) shows the image of oxygen sensor.

Fig (6)



III. COMMUNICATION SYSTEM

There are two modems

a) GSM MODEM

When there is abnormal condition message is sent using GSM modem to the transport office or any dear ones .

b) GPS MODEM

Message is sent along with the latitude and longitude of the location where the vehicle is by using GPS

IV. SIMULATION

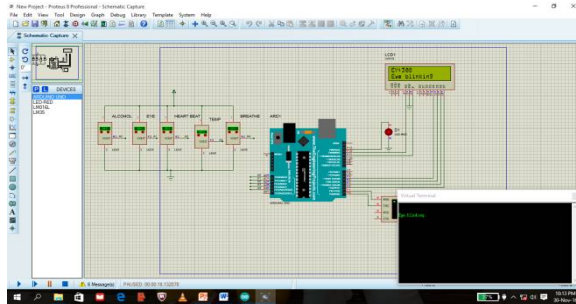
The simulation of the proposed system is carried out in Keil 4.0 version in order to implement successful hardware system. The simulation output of the system is shown in screenshot fig(7) in which the driver is detected as sleeping and in the same manner all other parameters are checked and displayed. And coding for the simulation done embedded

c Fig (7)

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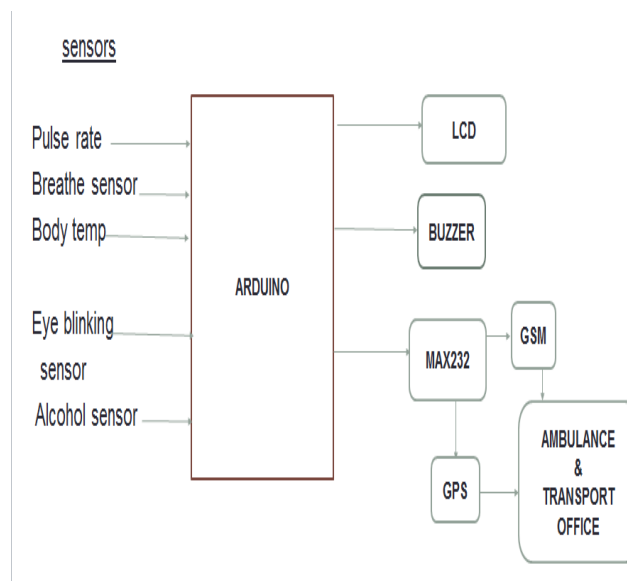


V. HARDWARE IMPLEMENTATION

In this system various sensors are used which are already discussed in above sections. The hardware includes ARUDINO UNO ATmega168 which is heart of the system that process the sensor values the main advantage of the ARUDINO is it can be powered via USB or external power supply. The values of the parameters are displayed on 16*2 LCD which is a basic model.



VI. SYSTEM BLOCK DIAGRAM





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VII.CONCLUSION

This paper deals with the issues related to road accidents caused due to driver's ill health this system determines various parameters like body temperature, blood pressure, pulse rate, oxygen level of driver and this system also detects whether the driver is alcoholic or not. The main objective of this project is to develop a robust system that continuously monitors drivers health. In case of any abnormality the system operates in such a way that will be able to avoid a possible accident. This system can also be for elderly people who are away from dear ones. The parameters like blood pressure can also be monitored

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