

Intelligent Car Driving System

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Abstract

The basic idea behind this project is, it implies that weather a person is at home, at outdoor, or at his work place, he/she can stay connected with the doctor and he can take immediate action if necessary. In this project we present automatic vehicle. In this project we interface alcohol sensor, Heart beat sensor and Blood pressure sensor for patient monitoring. The MQ-3 gas sensor is very sensitive to alcohol. A Heart beat sensor is used to check the user continuously. When any of the sensor output is high brakes of the vehicle will be activated and parking lights will be made ON. Also message will be sent to doctor or nearest hospital through GSM.

Keywords

Alcohol Sensor, Heart beat sensor, Blood pressure Sensor, Patient monitoring system, GSM.

I. Introduction

In this research work, we developed a group of sensors for measuring heart beat rate. Blood pressure level and drug level with real-time monitoring system based on GSM network. The Heartbeat, Blood pressure, Alcohol level which is measured by the sensor is processed by the ADC in the controller that data is read every second and will be stored on controller. The data from controller unit will be sent to base node through the GSM network. ARM controller hardware and GSM module are packed in suitable case and can send a message and immediate call to doctor's mobile if condition of patient is abnormal. This system can be used for the person who is not under continuous observation of doctor, can check patients vital signs using the sensors in this project. We are trying to implement it in a vehicle. Which will be more helpful for sick drivers. If the sensors output starts fluctuating above normal rate them braking system and parking light will be made on. Thereafter GSM sends an indication to doctors mobile immediately with its location.

These days it is not easy for doctors and the nurses to remain close to a patients bed side to monitor patient health condition. In the past, a huge and fixed monitoring device was used (only in hospitals) to know the health status of a patient when they are on a bed. These monitoring devices are only available in the hospitals and are constantly on the patient's body. Many of monitoring devices are not user friendly so it is important that the doctors and family members will have a device that can always monitor their patients when they are not around. One of the vital things to monitor on a patient is the Blood pressure, Heart beat rate. Also for the case of more safety we are also including Alcohol sensor as now a days Drink and Drive cases are more usual.

Another vital thing to monitor in a patient is the heartbeat rate. It is very important that heartbeat of patient should be normal. That is 72 BPM. If there is any abnormality, then the patient is in distress. Heartbeat rate means the number of heartbeats per unit of time. The normal heartbeat rate of a resting person is about to 70 bpm for adult males and 75 bpm for adult females. The average heartbeat per minute for 25-year old person ranges between 140-170 heartbeats per minute while for a 60-year old person it is typically between 115-140 beats per minute and body temperature is 37°C or 98.6 Fahrenheit.

Normally it is difficult to keep track of the abnormalities in the heartbeat count by manual means. Patients are not well versed with the manual treatments, which the doctors normally use for tracking the heartbeat count. Thus, there must be some kind of device which would help patients and their family member to monitor their

health by themselves. Thus this "Intelligent car driving system" is a smart system which will help the patient drivers to continuously monitor their Heat beat, Blood pressure and Alcohol level. In case if the value exceeds than a predefined value then brakes of vehicle will be activated and indication message will be sent to family doctor through GSM with location. Also parking lights will be On and car will start to make noise (Buzzer will be On).

II. Block diagram

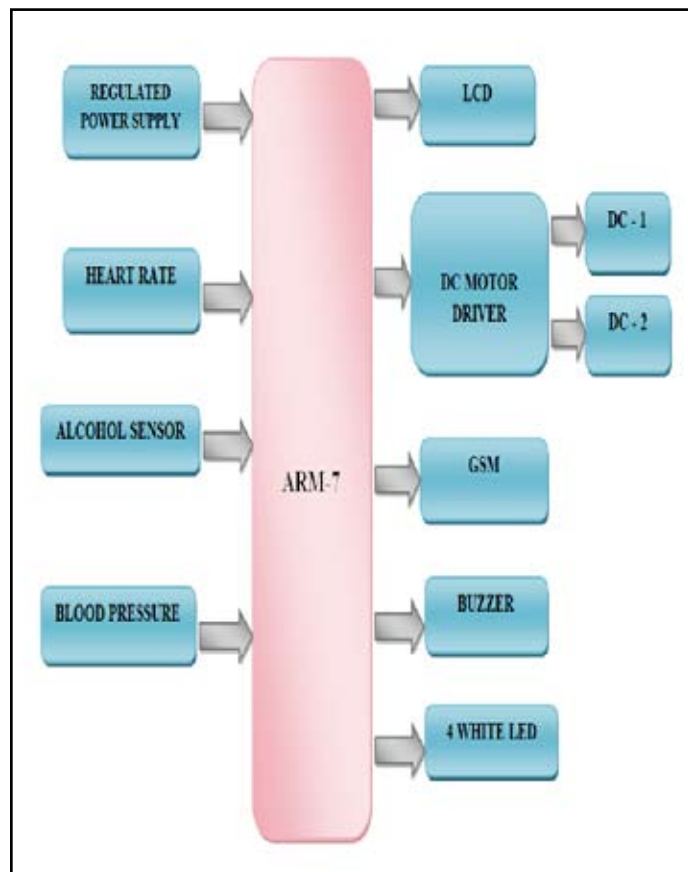


Fig. 1 Block Diagram

1. GSM modem

GSM (Global System for Mobile Communications, originally Groupe Spécial Mobile) is the standard developed by the European Telecommunications Standards Institute (ETSI) to describe protocols for second-generation digital cellular networks used by mobile phones, first deployed in Finland in

July 1991. 2014 was the default global standard for mobile communications - with over 90% market share, in 219 countries and territories. 2G networks developed as a replacement for first generation analog cellular networks and the GSM standard originally described a digital, circuit-switched network optimized for full duplex voice telephony.

The benefits of GSM include:

- Support for international roaming
- Distinction between user and device identification
- Excellent speech quality
- Wider range of services
- Interworking (e.g. with ISDN,DECT)
- Extensive security features
- GSM also stands out from other technologies with it wider range of services:
- Telephony
- Asynchronous and synchronous data services (2.4/4.8/9.6kbit/s)
- Access to packet data network(X.25)
- Telemetric services (SMS, fax, videotext)
- Many value-added features (call forwarding ,caller ID, voice mailbox)
- E-mail and Internet connections available services vary from operator to operator.

2. Alcohol sensor

Alcohol sensor is used to detect whether the person has consumed alcohol or not. The alcohol sensor which we have used is MQ3 sensor. This sensor is an analog sensor and the output is in analog form. So the output of this sensor is provided to the input of the ADC which will convert this analog output in digital input to the microcontroller. Sensitive material of MQ-3 gas sensor is SnO₂, which with lower conductivity in clean air.

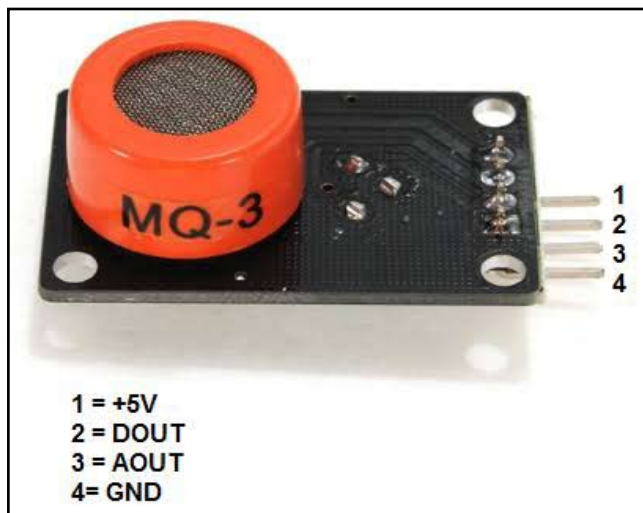


Fig. 2 : Alcohol Sensor

When the target alcohol gas exists, the sensor's conductivity is higher along with the gas concentration. Please use a simple electro circuit, which converts change of conductivity to corresponding output signal of gas concentration. MQ-3 gas sensor has high sensitivity to Alcohol, and has good resistance to disturb gasoline, smoke and vapour. The sensor could be used to detect alcohol with different concentration; it has low cost and is suitable for different applications.

3. Heartbeat sensor



Fig. 3 : Heartbeat Sensor

The pulse rate sensor is basically used to keep track on pulse rate of the person. In programming the maximum and the minimum set point is provided for the pulse rate. If the pulse rate goes above or below the set point then the alert will be immediately issued by the microcontroller. The Heartbeat Sensor is simple to study the heart's function. This sensor monitors the flow of blood through the fingertip. As the heart forces Blood through the blood vessels, the amount of pulse rate changes with time. The sensor shines a light lobe (small incandescent Lamp) through the fingertip and the light that is transmitted. The clip also can be used on a fingertip or on the web of skin between the thumb and Index finger. The signal is amplified, filtered and inverted in the box. By graphing this signal, the heart rate can be determined, and some details of pumping action of the heart can be seen on the LCD.

4. Blood pressure sensor

High blood pressure, also called as hypertension, occurs when the force (or pressure) of blood against your artery walls is high, causing excessive strain on your blood vessels. This condition is dangerous because its damaging effects occurred over time and may not become apparent until an individual's blood pressure is shockingly high. Hence, hypertension is sometimes known as "Silent Killer." The sensor used in this project is FGN type pressure sensor.

Description

FPN/FGN (Gauge) Package (8 mm tube length) with mV uncalibrated output. Best used with silicon tubing or directly attached to manifold. The FPN is dual in-line package while the FGN is surface mount package. Various pressure ranges are available.

Working of BP Sensor

Blood pressure sensor built up with the combination of pressure pump and pressure sensor which separate rectifier circuit and relay switches to ON and OFF the pressure pump and steps required to calculate the blood pressure are:

1. Switch on the sensor.
2. Start pressure pump which will increase the pressure.

III. Flowchart

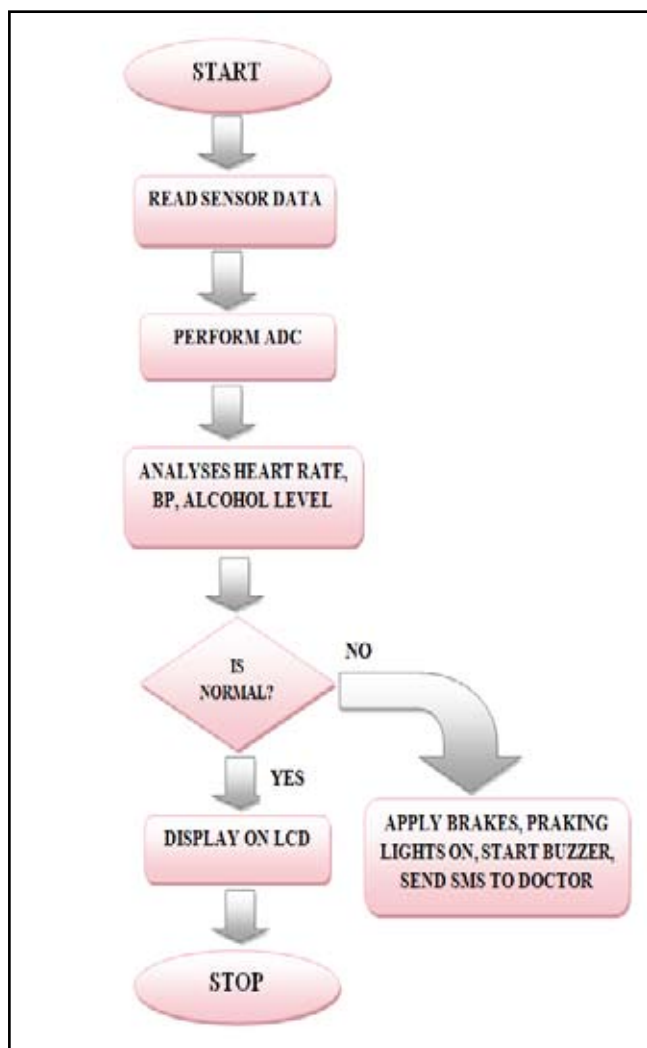


Fig. 4 : Flowchart

IV. Application

- This circuit can normally be used for patients for monitoring their heart rate while driving a car.
- This circuit can also be used in hospitals for monitoring purposes.
- This circuit can also be used for the training athletes during workouts for exercising below their maximum heart rates specified by their doctors.
- Useful for senior citizens and physically challenged people who are suffering from variation of BP level, and they can be rescued from sudden heart attacks.
- Using this system we can adjust the minimum and maximum levels of BP and heart beat, if the persons BP and heart beat exceeds the set levels then immediately the information will be passed through GSM to the concerned doctor so that we can save the life of the patient.
- This can be also helpful in avoiding car accident while driver is drunk.

V. Conclusion

This project will be more helpful for sick drivers those who are facing the problem of Blood pressure and are more susceptible to heart attacks. Also for more security and to overcome the cases of accidents in 'Drink and Drive' we are including Alcohol sensor, this technology will be more beneficial. For indication we are

including GSM technology. In case of any abnormality BP, Heart beat or drug level message will be send to doctor. Thus this project will help to reduce the accident cases on road due to medical issues of drivers.

VI. Future Scope

- Can be implemented in vehicles to reduce accidents.
- In case of any medical issues, Emergency medical services will be provided as location of vehicle will be traced and doctor will be informed instantly.
- Also can be implemented by using CAN protocol to increase the speed of data transmission.

References

- [1]. "A Tele-medicine System for Measuring Heart Rate, Blood pressure, And Drug Level Detection" D. Chandana, B. HemaLatha P G Scholar, Assistant Professor CVSR College Of Engineering, JNTU Hyderabad Andhra Pradesh, India 2014 IJEDR-Volume 2, Issue 1-ISSN: 2321-9939
- [2]. "A microcontroller-based automatic heart Rate counting system from fingertip" By Mamun A. L , Ahmed N ISSN: 1992-8645
- [3]. "Heart Rate Monitoring of Patient Using GSM" By Thatikonda Mounish International Journal of Research (IJR) Vol-2, Issue-2 ISSN 2348-6848
- [4]. "Robust Algorithm for Heart Rate (HR) Detection and Heart Rate" By Piotrowskia Z., Rózanowski K Variability (HRV) Estimation. ACTA PHYSICA POLONICA, vol. 118, pp. 131 – 135, No. 1/2010.

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