

A Novel Approach to Real Time Heart Rate Monitor

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Abstract—A practical means for unobtrusive and ubiquitous detection and monitoring of heart from a distance could be a powerful tool for health care, emergency and surveillance applications^[1]. *Wireless structural health monitoring research has drawn great attention in recent years from various research group, along with it if it's about the real-time location tracking (latitude & longitude) of a human then the challenges even grows. To address these challenges, we explore the ARDUINO approach to enhance the flexibility, mobility and at the same time monitoring. In this approach we will use an ARDUINO board with the peripheral sensors required for monitoring the pulse rate of a person and to send the real location of a person to any particular Mobile Telecom User's number when the pulse rate of a person gets too low or too high. All this is to be done wirelessly through coding of the ARDUINO and its proper interfacing with the peripheral devices.*

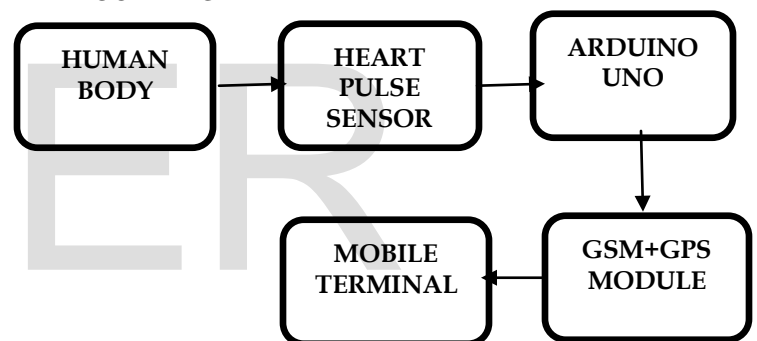
Index Terms- Heart Pulse Rate, Heart Pulse Rate Monitor, Arduino, Pulse Sensor, GSM Module.

1 INTRODUCTION

Heart rate monitors(HRMs) have become a common training tool in endurance sports. Most endurance athletes have at least tried HRMs and many use them consistently to monitor their training and to help them at the planned intensity. HRMs have developed rapidly from large instruments suitable only for laboratory use(around the 1900s) to the size of a watch in recent years. there have been developments in the accuracy of the measurements, increased storage capacity, and new functions have been added^[2]. Health monitoring is an emerging technology in Electronics Engineering. Rapid advances of wireless technology has also impacted the health-care industry significantly. One important objective to develop this is to prevent the restriction of movement of a person as a result of which the person's health can be monitored from anywhere without keeping the person connected to the the monitoring equipment through cable. Now our device will not only monitor the Heart Pulse Rate but also can track the real time Geo-Location of the person and can send text message alert to certain Mobile Telecom Numbers on lowering of the heart pulse rate below a certain pre-defined threshold. the person i.e latitude and longitude position. At the initial stage we only monitor the pulse of a person. The prototype consists of three main parts : i) ARDUINO UNO , ii) Pulse Sensor (XD-58C) , iii) Geo-location Tracker (SIM 908). The ARDUINO UNO is the central control unit of the entire system. Pulse sensor detects the pulse of a person and converts it into electrical data format and sends it the ARDUINO UNO.

Miniaturisation of sensors and the interfacing of this sensors with ARDUINO can make it possible to extend beyond the hospital confines. The proposed design focuses on the development wireless health monitoring prototype system along with location tracking of the person.

2 BLOCK DIAGRAM



3 WORKING PRINCIPLE

Pulse is nothing but a clotting of blood in veins and arteries when a particular segment of heart contracts and pushes blood in the veins and arteries. Pulse rate can be manually counted by holding the wrist of anybody and for one minute. We can also get pulse from ear lobes. This proposed circuit will measure pulse rate of a human body electronically and automatically and in case of emergency of pulse rate fall, this circuit triggers an auto-generated short message to a person near and dear one to the ailing person.

Atfirst the pulse sensor uses a set of Infrared emitter and receiver to get the pulse signal from human body(mounted on the earlobe of the person). When blood clots in the vein,the IR sensor encounters a larger reflection from the blood clot. The reflection registered by the receiver. The mechanical pulse signal is converted to an electrical signal by the pulse sensor. Pulse sensor collects this raw electrical signal and feeds it to the arduino. Arduino is an opensource development board. Arduino collects this analog electrical signal through an analog input port from the pulse sensor. Now this raw pulse signal is processed by the arduino. Arduino smoothens this signal and cut out the noises from it and determines the pulse rate of a human body. Arduino also compares the heart rate or the

pulse rate with a given minimum value. Whenever the measured pulse rate falls and crosses the minimum standard, arduino triggers a signal to the GSM module attached to it. This GSM module sends a emergency message to a particular mobile number. A reviewed version of this paper may be published shortly.

4 FUTURE WORKS

In the future this circuit can be attached with a GPS module and arduino application platform to enhance its adaptability. This circuit can be used as a location tracker of an ailing person or a deployed army soldier.

5 CONCLUSION

Gadgets are on its way for revolution. Wireless, portable, wearable these three features can enhance a gadget's level of implementation to much higher level. Thus our gadget is having all these features that will make it

6 REFERENCES

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