Available Online at www.ijcsmc.com

International Journal of Computer Science and Mobile Computing

A Monthly Journal of Computer Science and Information Technology

ISSN 2320–088X
IMPACT FACTOR: 6.017

IJCSMC, Vol. 7, Issue. 8, August 2018, pg.24 – 30

Wireless ECG and PULSE Sensor for Patient Health Monitoring System

B.Vasantha Rani[1], V.V.Srinivas[2]
[1,2]Department of Computer Science and Engineering
Badagalavasantha06@gmail.com, vsrinvas@diet.edu.in

Abstract: The present condition of patients in hospitals is completely keeping the patient on bed for months and years together which is making to feel the patient very uncomfortable , as they are not willing to stay but the patient condition should be monitored by the doctor whenever there is a an emergency situation. The goal of this project was to produce a wireless ECG and PULSE sensor for patient monitoring system which could allow the patients to be in the mobile environment. This will enable the doctor to observe the patient without having the physical present at bed side but they may be in hospital or at their home. This system includes a pulse sensor which measure pulse of the patient and ecg sensor to measure complete body condition of the patient.The entire kit will be connected to the patient if the patient condition reaches to the abnormal situation then an sms will be send to the doctor mobile via GSM SIM 800 module. The patient body temperature, ECG and heart rate are transferred to doctor and patient family member and to the nearest ambulance through an sms, in an abnormal situation to get an immediate treatment to the patient. The main advantage of this system is to compare the previous systems the energy consumption, speed up to increase the freedom and to enhance the patient quality of life.

Keywords: SENSORS, GSM MODULE, TRANSMITTER, RECEIVER

1. Introduction:

Health care monitoring system through smart phones has been increased rapidly in recent years, due to its easy accessible and to use. More number of people with low income facing issues with the high cost of health-care system. Heart and body temperature are the major things which are commonly measured by doctors after the immediate arrival of the patient to the hospital [1].There are two types of sensors we had used ECG sensor and PULSE sensor. The (ECG sensor) Electro Cardiogram Sensor allows you to assess the patient electrical and muscular functions of the heart. The ECG sensor is attached to the patient body using disposable electrodes green one to the right hand and red one to the left hand and yellow one to the side.The signal obtained from the

body is filtered and amplified .The Sensor will produce outputs as an analog signal which is then converted by the analog –to-digital converter. On the phone the ECG is displayed.Pulse Sensor is placed at finger and the pulse of the patient is displayed on the phone or screen.

2. **Literature Survey**:

The various studies carried out using existing techniques that have been applied in the field of patient monitoring. An extensive survey, which includes current trends in patient monitoring systems and related work on the remote patient monitoring system, is presented. The Review then focuses in detail on Wireless Sensor Networks and its applications. This chapter also reviews the current trends in remote monitoring of the post-operative patients in hospital environments, elderly patients at home.

3. Problem Statement

3.1. Existing System:

There are many problems with the present system. When the patient is being monitored when they are in the hospitals but they cannot be monitored once they are discharged. So these systems cannot be used at an individual level. Therefore to overcome these difficulties we propose a new system which is a Portable device for monitoring patient condition [09].there are some systems which are having many difficulties in the present system.

3.2. Proposed System

A GSM based "WIRELESS ECG AND PULSE SENSOR FOR PATIENT HEALTH MONITORING SYSTEM" is used. Mainly it consists of three parts of the system 1.ECG sensor 2. PULSE RATE sensor 3.transmitter (GSM module) and receiver (Mobile).

Pulse rate sensor is placed to the patient figure so that entire body pulse and body temperature can be shown in the form of graphical representation.ECG sensor there are three electrodes which can be placed at three different places in the body .so that it can measure the heart beat rate of the patient. Along with ECG and PULSE sensor there is a GSM module that means a transmitter which is placed at patient with stored mobile numbers of doctor, family member, nearest ambulance and mobile which means as a receiver which is placed at doctor side, patient family, nearest ambulance to get an

emergency condition of the patient can be delivered to the receiver in the form of message.

4. Modules:

- An embedded technology is used here
- AT Mega 328 micro controller is used
- SMS is used for transmitting data

5. System architecture model:

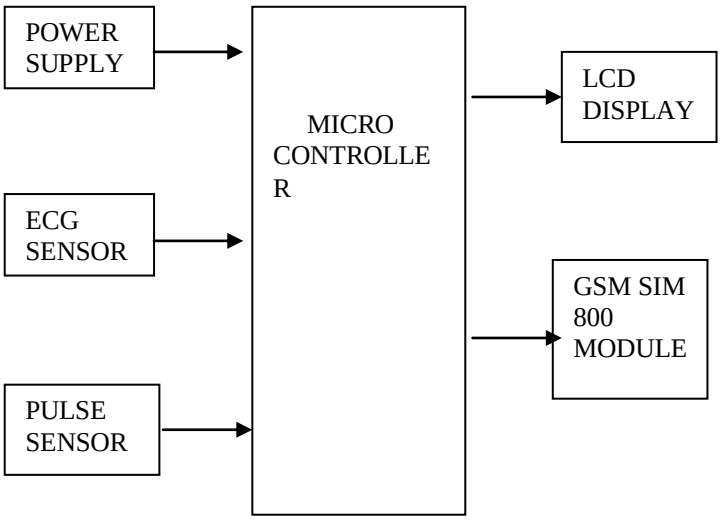

Fig 1: Block Daigram

6. Kit Connections:

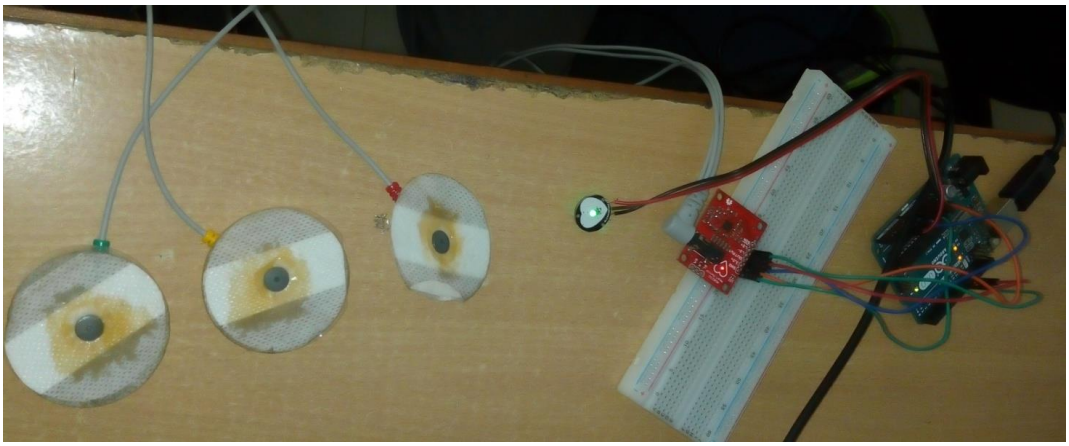

Fig 2:kit connections

7. Working Procedure

The primary function of the system is to monitor the two health parameters of a patient. We have monitored the entire body temperature and heart beat by using two

sensors one is PULSE sensor and the other one is ECG sensor .Data collected by these sensors is sent to the Microcontroller. The Microcontroller will then transmit the data to the user in the form of SMS. We are using the GSM SIM 800 module in order to transmit the data.

From the transmitter, the emergency recordings of patient health parameters are sent via SMS to the family members, and to the doctor, and to the nearest ambulance which have been given as the recipient. Not only sending the data through GSM SIM 800 module as SMS, we will also display the readings on LCD. when the condition go to the abnormal condition then we can sense those values by blowing the alarrm people around the patient can be alert and the patient care taker and the doctor can receive SMS.

The functioning of the Heart Beat device is based on the blood circulation and for every heartbeat that can be sensed by using a circuit formed by the combination of an LDR and LED. Depending upon the rate of circulation of blood the heart beat rate per minute is calculated. This calculated value is communicated to remote person through a GSM SIM 800 module which had interfaced to it.

It mainly consists of following blocks:

1) Arduino uno

2) ECG Sensor

3) Pulse rate sensor

4) GSM Modem (sim800 unit)

8. Results:

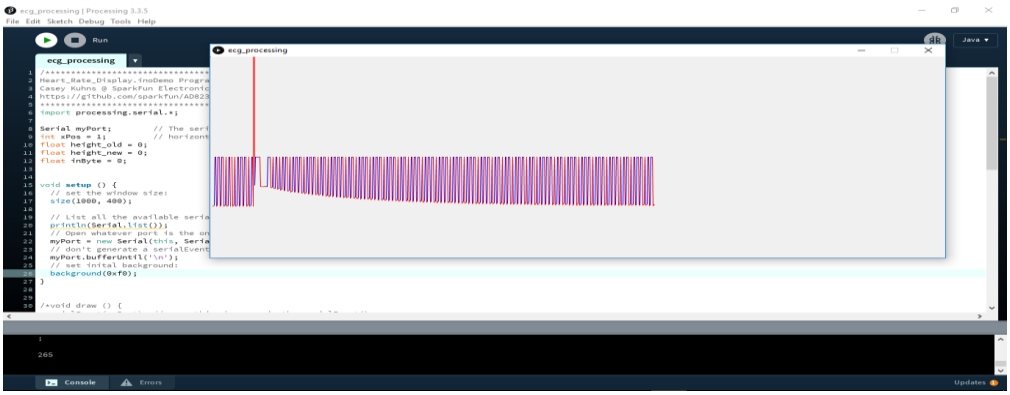

Fig 2: When kit is connected to patient

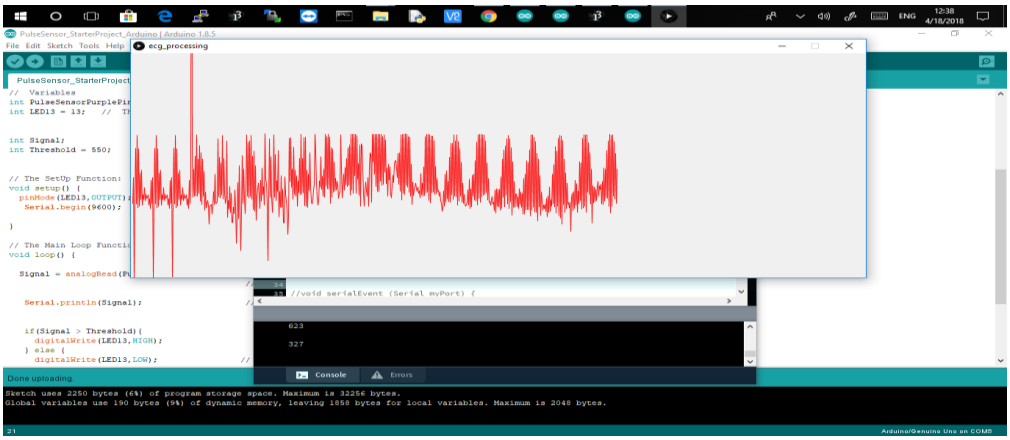

Fig 3: Pulse of a patient

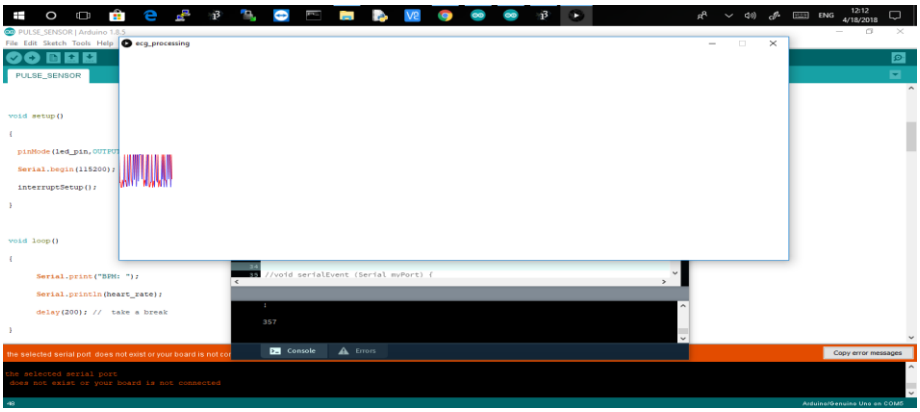

Fig 4: Ecg of a patient

9. Conclusion

The main aim of the project is that instead of staying in hospitals for months together we can save the life of the patient and even the time before it is too late.Not only that the people who cannot effort more money for staying in hospitals for longer period of time can make use of this kit. Continous monitoring of patient health and it is very less cost to get the treatment in time.The system is portable which can be used very easily.

10.Future Work

- Multiple parameters like Blood pressure, retinal size, age and weight can be included as controlling parameters in the future
- This system also developed by using advanced GSM and GPRS technology in future.

References:

1. Ovidiu Apostu, Bogdan Hagiu, Sever Paşca, Wireless ECG Monitoring and Alarm System Using ZigBee"2011 The International Symposium on ADVANCED TOPIC INELECTRICAL ENGINEERING2068-7966/ATEE 2011.

2. David Culler, Deborab Esrtin, Mani Sivastava. "Overview of Sensor Networks", IEEE Computer Society, August 2004.

3. "Healthcare Monitoring System Using Wireless Sensor Network", D. Mahesh Kumar, Department of Electronics, PSG College of Arts and Science, Coimbatore - 641 014. Volume 04, Issue 01 Pages:1497-1500 (2012), ISSN: 0975-0290

4. Jafari R, Encarnacao A, Zahoory A, Dabiri F, Noshadi H, Sarrafzadeh M (2005). Wireless Sensor Networks for Health Monitoring. Proceedings of the Second Annual IEEE International Conference on Mobile and Ubiquitous Systems: Networking and Services (MobiQuitous'05), San Diego, California, USA., pp. 479-481

5. Rajalakhshmi.S S.Nikilla, â€œReal Time Health Monitoring System using Arduinoâ€•, South Asian Journal of Engineering and Technology Vol.2, No.18 (2016) 52â€"60 ISSN No: 2454-9614

6. C. K. Das, M. W. Alam and M. I. Hoque, â€œA Wireless Heartbeat and Temperature Monitoring System for Remote Patientsâ€•, ICMERE2013-PI-197

7. Manisha Shelar, Jaykaran Singh, Mukesh Tiwari, â€œWireless Patient Health Monitoring Systemâ€•, International Journal of Computer Applications (0975 â€" 8887) Volume 62â€" No.6, January 2013.

8. Md. Asaduzzaman Miah, Mir Hussain Kabir, Md. Siddiqur Rahman Tanveer and M. A. H. Akhand, â€œContinuous Heart Rate and Body Temperature Monitoring System using Arduino UNO and Android Deviceâ€•. International Conference on Electrical Information and Communication Technology Volume 10.1109/EICT.2015.7391943.

9. Prof. Y. R. Risodkar. Prof. M. K. Sangole. Amruta. R. Vankhede. Ravi. S. Medhe. Jayashri. K. Shirsat, â€œWeb Based Health Monitoring Systemâ€•, International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE) Volume 4, Issue 1, January 2015, ISSN: 2278 â€" 909X

10. Simmers, Louise. Diversified Health Occupations. 2nd Edition, Canada: Delmar, 1988:150-151.

11. Y. S. Satyanarayan, Y. R. Satyanarayan, D. H. Desai: "Intelligent Wireless Emergency Alert System for Patient Monitoring using AT89S52 Microcontroller", IJAREEIE, Vol. 2, Issue 4, April 2013.

12. S. Mada, Sandhyarani S, "An Adaptive Embedded System for helping Patients", IJCTT, Volume 2, Issue 2, 2011.

13. Eisman, Louis, Biology and Human Progress. Englewood Cliffs, NJ: Prentice Hall, 1972: 125

