e-ISJN: A4372-3114
p-ISJN: A4372-3115

ISSN: 2321-7782 (Online)
ISSN: 2347-1778 (Print)
Impact Factor: 7.327

Volume 7, Issue 4, April 2019

International Journal of Advance Research in Computer Science and Management Studies

Research Article / Survey Paper / Case Study

Available online at: www.ijarcsms.com

The Survey on soft Computing Approach for Health Monitoring System

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Abstract: ***In a hospital health care monitoring system it is necessary to constantly monitor the patient's physiological parameters. For example a pregnant woman parameters such as blood pressure (BP) and heart rate of the woman and heart rate and movements of fetal to control their health condition. This project presents a monitoring system that has the capability to monitor physiological parameters from multiple patient bodies. Here, a coordinator node has attached on patient body to collect all the signals from the wireless sensors and sends them to the base station. The attached sensors on patient's body form a wireless body sensor network (WBSN) and they are able to sense the heart rate, blood pressure and so on. The sensors can detect the abnormal conditions, issue an alarm to the patient and send a SMS/E-mail to the physician. The main advantage of this is to reduce the energy consumption to prolong the network lifetime, speed up and extend the communication coverage to increase the freedom for enhance patient quality of life.***

Keywords: Blood pressure (BP), Wireless body sensor network (WBSN).

I. INTRODUCTION

Body sensor network systems can help people by providing healthcare services such as medical monitoring, memory enhancement, medical data access, and communication with the healthcare provider in emergency situations through the SMS or GPRS. Continuous health monitoring with wearable or clothing-embedded transducers and implantable body sensor networks will increase detection of emergency conditions in at risk patients. Not only the patient, but also their families will benefit from these. Also, these systems provide useful methods to remotely acquire and monitor the physiological signals without the need of interruption of the patient's normal life, thus improving life quality. Although present systems allow continuous monitoring of patient vital signs, these systems require the sensors to be placed bedside monitors or PCs, and limit the patient to his bed. But now, there is no relation between the sensors and the bedside equipment due to the wireless devices and wireless networks. These systems do not require the patient to be limited to his bed and allow him to move around but requires being within a specific distance from the bedside monitor. Out of this range, it is not possible to collect data. In these, the sensors attached on the patient body, and are then transmitted to the remote base-station and a PC for storing and analyzing acquire the patient's physiological signals. In addition, an emergency alert service using short message service (SMS) messaging is also added to the proposed system for emergency responses and rescues.

II. LITERATURE SURVEY

1. A Comprehensive Ubiquitous Healthcare Solution on an Android Mobile Device:

Nowadays It Has Become Important To Focus On Healthcare Awareness And Also The Growth Of Wireless Mobile Technologies. For This Reason Ubiquitous Health Care Solutions Has Become Important As It Provides Services At Anytime And Anywhere. To Complete Our Needs Android Smart Phone Device Has Put Fourth Mobile Monitoring Terminal To Observe And Analyse Ecs [Electrocardiography] Waveforms From Wearable Ecg Devices In Real Time Under The Coverage Of Wireless Sensor Network. Due To Use Of Wireless Sensor Network In A Healthcare We Are Able To Reduce Complications Of Wire Networks And We Can Move A Healthcare From One Location To Another Desired Location. Mobile Phones Are Used As Barcode Decoder For Medicinal Care As An Extension To Monitoring Schemes.

2. Android Based Body Area Network for the Evaluation of Medical Parameters:

There Are Various Vital Parameters In This System. They Are ECG, Heart Rate, Heart Rate Variability, Pulse Oximetry, Plethysmography And Fall Detection. The Tele-medical System Is the System Which Focuses on the System Which Focuses on the Measurement and Evaluation of These Vital Parameters. In a Android Smartphones There Are Two Different Designers Of A (Wireless) Body Networks The Real Time System Features Several Capabilities. Data Acquisition In The (W) Ban Plus The Use Of The Smartphone Sensors, Data Transmission And Emergency Communication With First Responders And Clinical Server. It Is Very Important To Smart And Energy Efficient Sensors.

3. Design and Development of E-Health Care Monitoring System As We Are Dealing With E-Health Care Monitoring System:

Our System Designs Is Based On The Wireless Sensor Networks (WSN) And Smart Devices. It Is Very Important To Have Strong Networks Between Doctor, Patient, And Care Givers Judges The Condition Of The Patient. Sensors Are Used To Monitoring Of Patient Surrounding As Well As Health, These Sensors Are Medical And Environmental Sensors. Sensors Are Relayed To The Prior Devices Through The Transmitter And Them To The End User. In This System Doctor And Care Takers Can Observe Patient Without Exactly Visiting The Patient Actually. And Furtherly They Can Upload Medicines And Medical Reports On The Web Server Which After Can Be Accessed By The Patient Anywhere At Any time.

4. Health Gear: A Real-Time Wearable System for Monitoring and Analysing Physiological Signals:

A Health Gear Presents A Real Time Wearable System For Monitoring, Visualising And Analysing Physiological Signals. Set Of Non-Invasive Physiological Sensors Are Wirelessly Connected To A Cell Phone, Which Stores, Transmits And Analyses The Physiological Data And Then It Presents It To The User In An Appropriate Way. Set Of NonPervasive Sensors Are Part Of Health Gear. To Monitor The Users Blood Oxygen Level And Pule While Sleeping, We Focus On Implementation Of Health Gear Using A Blood Oximeter. Also The Two Different Algorithms.

5. Patient Health Management System Using E-Health Monitoring Architecture:

This System Is Based On An Android Application & A Wireless Network Which Will Be Used For Monitoring Patients Health Report In Real Time. This System Is Developed In A Such Way That It Would Be More Useful In Emergency Conditions. With This System It Will Be Possible To Analyse Patient Using Tele-monitoring. Sensors Will Be Used To Monitor Patients Health Continuously And It Will Be Updated On Server. The Patients Medical History Is Being Stored On Cloud For Global Access.

6. Low Cost and Portable Patient Monitoring System for E-Health Services in Bangladesh:

This Paper Propose An Efficient Low Cost & Portable Patients Health Monitoring System. A Raspberry Pi Based System Is Developed for Collecting Sensed Data from Sensor (Sensors like Temperature, Blood Pressure, Oximeter Etc. Are Used) These

Signals From Patients Will Be Send To Doctor For Remotely Analysing The Patients Health Report. A Web Based Application Has Been Developed For Both Patients and Doctors through Which They Can Even Communicate With Each Other. This System Can Be More Useful For The Peoples From Rural Areas.

III. PROPOSED SYSTEM

The system permits for recording and storing all information into the personal computer via connecting Arduino using a serial cable. The model exactness and impediments have been considered through a data collected from 70 persons with various ages for men and woman. Each sensor is programmed in the IDE environment so that data is collected and processed then sent wirelessly using ZigBee. After data collected, the processing unit checked if any emergency case occurs depending on vital signs domain. These vital measurements (blood pressure, glucose and heart rate) are graded from 0 to 3 depend on certain ranges of the readings.

Fig1: Architecture of health care monitoring system

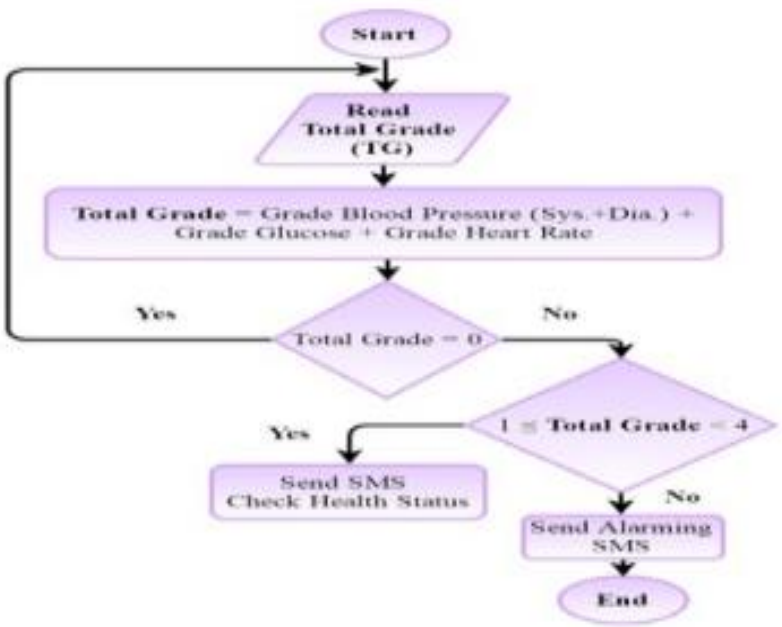

Fig 2: Workflow of the system

The total grade is calculated by adding the grades of the vital signs. If total grade equal to 4 or above is a refers to a patient at the emergent case, then SMS directly should be sent while if total grade equal to 1 or more the patient's health status should be checked. The figure 5 illustrates how to compute the total grade, which is carried out via collecting the grades of (blood pressure, glucose, and heart rate) .When the total grade equal to 4 or above, which refers an emergency case and immediately the system will send alarming SMS that includes patient id, vital signs levels, and GPS coordinates.

IV. IMPLEMENTATION OF THE MODEL

Different sensors (i.e. temperature sensor, pulse sensor, heart rate sensor) will be placed in the body of the patient. All the different sensors will be connected to the patient mobile phone via bluetooth/zigbee/wlan to observe the condition of the patient. If any emergency happened at the time, then the cellphone network with the internet connected will notify the ambulance, relatives, and doctors. Once doctor and relatives receive message with the location then they can go to the patient and doctor can start treatment of the patient to recover from abnormal condition. When any person admitted onto the hospital, at the time patient's relation should register their information onto the hospital server. Then the server provides the mobile application for patient's relation. It will helpful to monitor the patient's health condition in live streaming. It senses the patient's health condition by using wearable sensors. If any emergency happened onto the particular patient's, the intimation sends to both doctor and patient's relation.Then the doctor visits to the patient and recover the patient from the abnormal conditions.

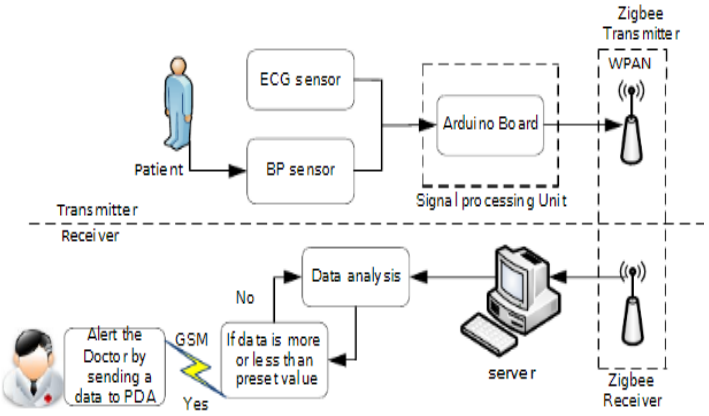

Fig 3: Working of the Healthcare Monitoring System Using Sensors

V. DESIGN/METHODOLOGY

In this paper, we developed and designed a prototype; a wireless ring sensor (SensoRing) to create a wearable biofeedback system, that had the goal of enhanced accuracy and user-friendliness typical of wearable commercial products. The wireless platform was designed to acquire multiparameters of vital signs, including custom made hardware architecture, signal preprocessing, power management, and seamless connectivity. It also has an application platform and PC-based graphical user interface (GUI) software to allow quick and robust integration of several signal processing algorithms. The proposed architecture is capable of managing a network of sensors where up to eight sensor nodes can connect to a single host. Cross-talk in between sensor and node is also achievable. The SensoRing consists of three major components hardware design, where the sensors, which collect physiological data and communicate with the hardware; 2) the wireless network protocol to Communicate in between hardware and software; and 3) software design that includes the processing unit to extract and analyze the data to a meaningful level.

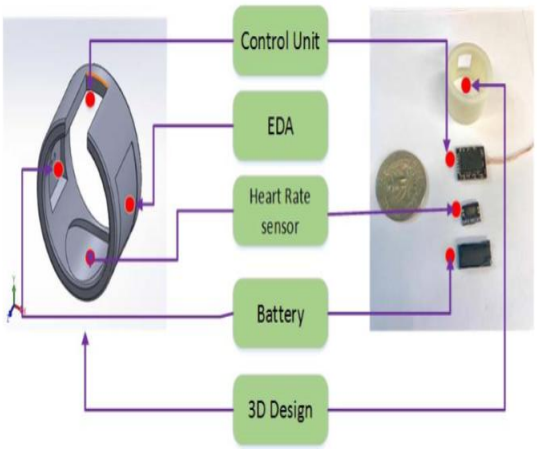

Fig 4 : Prototype of the developed wearable device

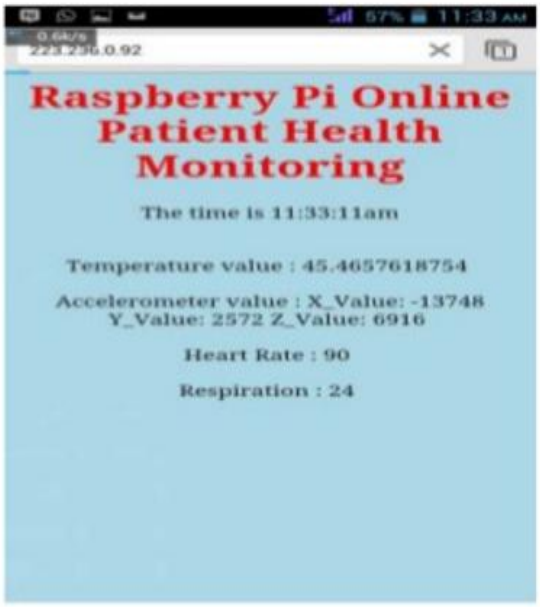

Fig 5: Message Sent to the doctor and relatives

VI. CONCLUSION

This project works onto construct the Healthcare Monitoring System (HMS) by using Wireless Sensor Networks (WSN). To improve the reputation of the hospital, we proposed a secure and lightweight system. The medical data is transmitted highly secure manner by using Group of Sending Scheme (GSS). In case any emergency happened onto the patient's, at the time this scheme provides information to doctor and then recover patient's from abnormal condition. The entire system consists of a coordinator node to acquire the patient's physiological data, a WMHRN to forward the data and a BS to collect the data. The system is able to carry out a long-tem monitoring on patient's condition and is equipped with an emergency rescue mechanism using SMS/E-mail. Monitoring of Patient's vital signs possible to be lifesaving for people suffering from chronic illness, furthermore there will be less hospital time. In the present work, the general layout and running of the ehealthcare monitoring system for collecting blood pressure, glucose level, and heart rate have been presented. The vital signals sent wireless via ZigBee and shown through system home page. Moreover, the alarming SMS that includes patient id, vital signs grades, and GPS coordinates has been send immediately to the specialist person in any an emergency case.

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