

A Review on Healthcare Monitoring System Using Sensors

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Abstract- This paper deals with the review on healthcare Monitoring System using Sensors. Currently a health problem of human being is the highest problem and several solution in different way are available, however monitoring health problem using sensors gives us real time precautions parameter and studying those parameter, a solution can be find out in so time. The healthcare wireless sensor networks (HWSNs) offers support to access these sensors to allow for continuous patient monitoring. HWSNs are special field which allows continuous access to patient's sensors by which the system can detect and give alert to the medical state immediately. It helps to improve patient health monitoring as well as continuous manner. In this paper, the health care monitoring is simplified by using software i.e MATLAB to diagnosis the disease of patients and giving precautions to patient instantly without any effort and treat to patient particular when patients are in critical conditions.

Keywords - Sensors, Healthcare, HWSNs, MATLAB.

I.INTRODUCTION

1.1 HEALTHCARE WIRELESS SENSOR NETWORK (HWSNS)

It is specific field of sensor network applied to healthcare solution. It is the field now top with electronics devices, computers and internet. The system collects data and senses it wirelessly over the world so times. It can be applied to several field including forests, traffic monitoring and environmental monitoring etc., but in the field of medical science it is very useful since it is attached with human life. In hospital most of the staff perform task of monitoring in periodic intervals as per their convenience, and get the parameters information on that time only, however with application of HWSNs, they can get information continuously let ever visiting to patient and give attention in tight careful situation with the help of sensors attached to patients. These sensors are put on HWSNs to see the collected data in remote locations through internet [1].

The use of sensor nodes is challenging because when patients are hospitalized then they should keep their mobility as much as in order to promote their quality of lab. This is the challenging task and HWSNs should does mobility support of sensor nodes allowed by patients. The network coverage is one of the problems with mobility of sensor nodes. For this purpose HWSNs should enlarge multiple access ports and support rout variation in order to reach each sensor nodes [2]. In addition for getting continuous access to sensor nodes, a valid route to each one at all times must be available. Another port is handover, which mechanism to support the power of attachment change to the network. The accuracy of handover mechanism can allow for continuous connection to the sensor nodes in HWSNs. Special focus is dedicated to most recent handover mechanism that support sensor nodes intra mobility. This does need close control and data acquisition is purse on time [3].

The principles of HWSNs are;

- Real time monitoring.
- Random and continuous motion of sensor nodes.
- Desirable long life of batteries.

1.2 WIRELESS BODY AREA NETWORK

Wireless Body area network is a type of biomedical sensor networks. The Biomedical sensor nodes in WBAN are placed on, near or within a human body. In a medical healthcare system, WBAN continuously provides monitoring healthcare of especially elderly or ill people wherever needed. The Biomedical nodes sense and process vital signs such as heart rate, blood pressure, body temperature, respiratory from the human body. Then, they send collected data to a medical center via a base station in order to monitor human health by medical professionals. In the medical center, doctors/caregivers need monitoring systems/interfaces to process, analyze and visualize the received data from WBAN based systems [4].

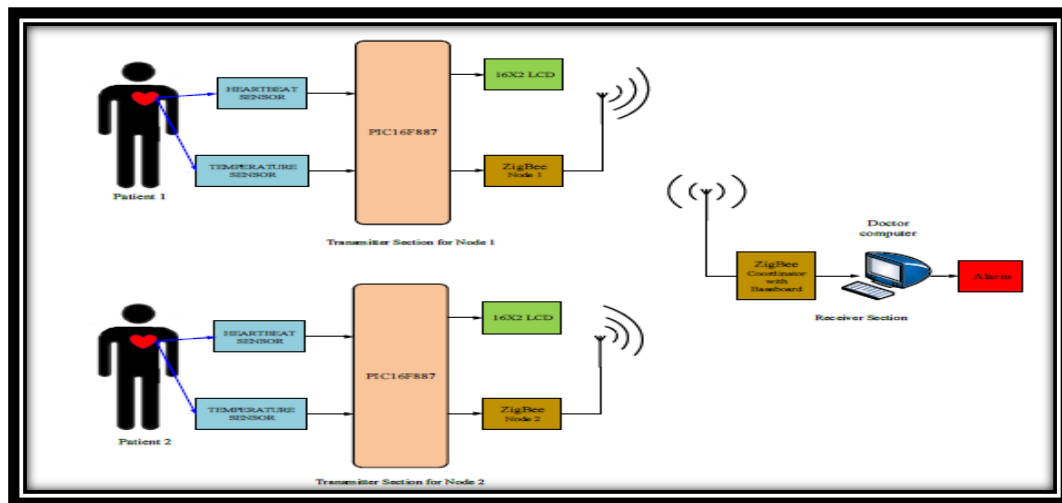


Fig 1. Block diagram of Functional System

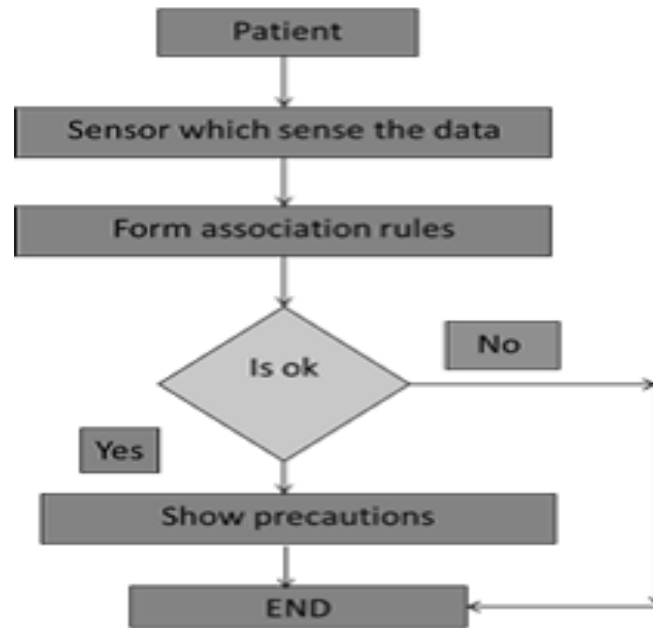
These systems use wireless technologies to transmit vital signs for medical evaluation. It is mainly used for transferring the various monitoring information about the various patients in hospitals. Wireless sensor networks have many technologies. Such as the Infrared, Bluetooth and ZigBee, Touchscreen etc. Because the angle limit problem of the infrared transmission, and the infrared have not been used for physiological signal transmission. Although Bluetooth is better than ZigBee for transmission rate, but the ZigBee technology has lower power consumption. Hence, ZigBee is generally used for 24 hours monitoring of communication transmission systems. As compared to Bluetooth, ZigBee provides higher network flexibility and a larger number of nodes connectivity, and a better transmission range with low power consumption. Large number of nodes enables the expansion of such systems. Recently, ZigBee-based wireless networks were tested in various applications [5].

II. OBJECTIVE OF RESEARCH WORK

The purpose of this work is to simulate the intra mobility solution with special attention on HWSNs. In hospital patients have to wait long time to meet the doctor and in critical condition the patients can not wait and faces several problems. The main objective of this study is to provide the things to patient via software to diagnosis the disease and giving the precaution to patients instantly without any effort or any other means. The patient has to communicate the precaution of disease and get solution [6].

III. SYSTEM CONFIGURATION

The simulation model, MATLAB used for this purpose which provides high performance computation and visualization. The most important feature is its providing capability which is very easy to leave and to use. The user can send its symptoms like temperature, blood pressure, ECG; heart bits etc via sensor and get the predictions by giving the symptoms of the users [7].

Flowchart for procedure:**Fig 2. Flowchart of System****System overview**

Thesystems have four main parts,

- Sensing module
- Processing module
- Communication module.
- Power supply.

1. Sensing Module:It provides ability to collect certain parameters.

2. Processing Module:It includes the microcontroller which detects the capacity of Sensor node to run Program and process data [8].

3. Communication Module: It sends the data wirelessly to a network typically compliant with IEEE802.15.4 standarerd.

4. Power Supply:It is an importantpart, work as energy source for keeping node alive [9].

IV. CONCLUSION

In this paper, we present a wireless health monitoring system which is able to receive data on receiver side and immediate action will be taken according to the results obtained. This system provides effective solution to upgrade the existing health system by using different kind of sensors mounted on a single system .With the use of HWSNs a detailed comprehensive analysis of patient's disease can be done by saving lot of time. It will provide textual information to the patient so that patient can read it anywhere and act accordingly. The system is convenient and efficient in nature and thus increases interaction between patient and doctor and ultimately avoids unexpected tragedy. The use of this technique for patient monitoring can be key aspect for healthcare precaution. The healthcare provides should be improved with this technology [10].

V. APPLICATION OF WSN IN HEALTHCARE

Healthcare is always a big concern, since it involves the quality of life a given individual can have. It is always better to prevent an illness than to treat it, so individual monitoring is required as a periodic activity. The aging population of developed countries present a growing slice of government's budget, and presents new challenges to healthcare systems, namely with elderly people living on independent senior housing. Traditionally, health monitoring is performed on a periodic check basis, where the patient must remember its symptoms; the doctor performs some check and formulates a diagnostic, then monitors patient progress along the treatment, if possible[11]. However, some symptoms only manifest themselves in daily activities, where an individual may feel some pain or discomfort. Healthcare applications of wireless sensor networks allow in-home assistance, smart nursing homes, clinical trial and research augmentation [12]. In-home healthcare becomes mandatory for diseases like Parkinson or Alzheimer, providing memory enhancement through medicine reminders, mental stimulation through sounds or images of object's location control over home appliances, medical data lookup, and emergency situations. Such approach may lead to a multi-tiered architecture, with lightweight mobile computers and smart sensors in conjunction with more powerful computational devices [13].

Healthcare Application

1. Glucose level monitoring
2. Asthma.
3. Preventing medical accidents.
4. Cardiovascular diseases
5. Alzheimer, depression, and elderly people monitoring.
6. Stroke and post-stroke.
7. Artificial retina.
8. Home monitoring
9. Heart rate monitoring
10. Artificial retina.
11. Mobihealth
12. Multi-electrophysiological system[14].

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