A REVIEW ON PATIENT MONITORING SYSTEM

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ABSTRACT

In this paper a survey is done on various patient monitoring systems, which make easy of monitoring patient's physical parameters & help doctors to provide on time & efficient treatment to the patient. In a hospital health care monitoring system it is necessary to constantly monitor the patient's physiological parameters. For example such as temperature, heart rate of the patient to control their health condition. This system presents a monitoring system that has the capability to monitor physiological parameters from multiple patient bodies. In the proposed systems, a coordinator node has attached on patient body to collect all the signals from the wireless sensors and sends them to the base station. This systems can detect the abnormal conditions of patient.

KEYWORDS: Patient, wireless body sensor, heartbeat, temperature, GSM module, ZigBee, Bluetooth, Trans-reception of data.

INTRODUCTION

The patient monitoring system plays a crucial role monitoring of patients in ICU & in general ward, provides continuous data analysis & display a patients vital functions. Wireless networks are generally used in hospitals for administration purpose but not for the monitoring of patients. Medical instruments that measure important human physical parameters [4, 8, 13] which are generally not connected to a Local Area Network (LAN) and cannot be accessed remotely. However, having networked instruments would allow instrumentation data outputs to be recorded electronically and accessed via a LAN connection. This would allow the outputs of instrumentation inserted into a patient's record which could streamline clerical data entry procedures [9, 11, 12]. Even after connecting these systems to a particular patient, a paramedical assistant need to continuously monitor and note down all the vital parameters of a given patient by keeping track of all of his/her records manually. Adopting such a method is error prone and may lead to disaster in the case of a human error detection [10, 11, 15]. The patient monitoring systems would be beneficial for medical practitioners to do proper and better treatment; also it would be useful for health care providers to improve disease management. The patient is monitored from ICU and the data transferred to the PC is wired. Recent work includes using Bluetooth technology coupled with the GSM technology to report signs to PDAs held by the patient or his doctor. Monitoring based on ultra wideband-based personal area networks was reported in architectural framework for a system that utilizes mobile techniques to wirelessly monitor the ECG of cardiac patients. [9,14]The work reported in discusses the implementation issues, and

describes the overall system architecture of a Bluetooth sensor network for patient monitoring in, the authors investigate the use of ZigBee and mobile phones in monitoring elderly patients with diabetes mellitus or heart diseases [10, 13, 14].

The implications of these wearable health monitoring technologies are paramount, since they could enable the detection of early signs of health deterioration, notify health care providers of critical situations, find correlations between lifestyle and health, or bring healthcare to remote locations and developing countries, and transform health care by providing doctors with multi-sourced real-time physiological data [12, 16]. The sensors are the devices that can enumerate parameters or events in the physical world into electrical signals that can be measured and analyzed. Using this sensors we can read & translate the patient's physical parameters such as temp .BP, heart rate, ECG etc. & by using this wireless sensors we can make system more compact & compatible. Patient monitoring helps doctors & as well as family members to get proper acquiescence of a persons or patients health. The wireless sensors like Bluetooth, ZigBee, GSM, etc. can be used. Depending on the sensor capacity & compatibility the Efficiency & accuracy of the system depends [15, 16]. Also we can give security to the data of patient or security to the patient by using RF-ID, thumb printing sensor,& keypad i.e. password system for the all staff of the hospital i.e. only authorized person can treat the patient.

LITERATURE SURVEY

In [1], a wireless stand-alone, embedded system platform which uses a collection of biosensors and discrete electronics is proposed that combines the sighting of three biomedical factors namely blood glucose concentration, heart rate, and pulse oximetry into a single personal medical device. These medical factors targets patients suffering from definite dearth like diabetes and cardiovascular diseases. The objective of the said work is to build a compact and economic device capable of monitoring several medical attributes while patients conduct their normal daily routines, and store these attributes readings in an embedded system-based portable device. A communication protocol and

patient monitoring software application are developed to store data that can be later downloaded to a physician's workstation for analysis and diagnosis. The advantage of the said system is in the device's prototyping surface area and the overall system's development time which did not exceed 6 months with cost-effective design due to the use of an all-purpose RISC-based microcontroller

In [2], the major goal is to present an automation system for a hospital's clinical analysis laboratory. The system described uses contactless smart cards to store patient's information and for the authentication of hospital employees in the system. The proposed system also uses RFID tags perplexed to containers containing patient's poised samples for the correct identification of the patient who provided the samples. This work illustrates a hospital laboratory workflow, presents the system's modeling and presume with security matters related to information stored in the smart cards.

In [3] telemedicine technique is employed in that the patient's decisive signs like ECG, heart rate, breathing rate, temperature, SpO2 are contracted and the values are stored into the database then uploaded into the web based server and sent to the doctor's phone using android technology. An effective feedback system is also incorporate which enables the doctors to instantly send back their feedback to the nurse station. In future the entire details of the patient suffering from diverse degenerative diseases like cancer, Alzheimer's etc. can be sent to a doctor sitting abroad in order to analyze and recommend the type of treatment and medicines for the diagnosis of the disease

In [4] the system employed describes the implementation of a telemedicine system using mobile telephony. This application makes ease in using any patient monitoring with a RS-232 interface due to its generality, quick response and high reliability. This features made it easy to represent an applicable solution to tele homecare. In near future this system proves itself beneficial for senior citizens as they have been increasing in the last few years. However, as living is becomes more stressful than ever, there are more cases of chronic diseases. The

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difficulties of transport in the metropolitan cities and the exiguity of hospital streambeds turn the home care an attractive solution. However, its routines can be changed by telemedicine.

In [5] a responsive wireless medical information system that heaps patient's data to be ciphered and patient details to be entered by medical practitioners using mobile computing devices is represented. Mobile and wireless techniques are combined that can be used to interact with a medical information system for controlling real-time data streaming medical instruments. The MISN contains medical information nodes (Linux based platform easily connected with LAN) networked to a central server and could be accessed by a mobile computing device using a wireless Bluetooth connection. Using MIN the output of an ECG instrument to be viewed using web browser and to record the ECG instrument's output into a file that is saved on a central server is possible. That is the ECG instrument's output could be directly extracted into a patient database without further human interaction. Two methods are analyzed for displaying real-time waveforms using JPEG format or a custom data format & found that using a custom data format is to represent an ECG waveform did not require a high data rate but that a custom program was required to view the ECG waveform. Using Bluetooth is beneficial in this regard due to its short range ensures that the MIN only to be accessed when the user is within a particular location. This allowed the MIN to provide location specific access to medical instruments depending on where the user is. The analysis is also done by bluetooth serial port and dialup profiles for streaming the real-time ECG waveform data. Authors observed that bluetooth serial profile was ideal to use due to its less complexity and high data rates.

In [6] a real time tele monitoring system for health care is presented. The system consists of various sensors such as temperature, SPO2, heart rate, breath rate for data collection, data transmission devices and LabVIEW for Soft Computing and graphical user interface (GUI). From the received data calculation of Anaerobic Threshold (AT), VO2max and Total Calories Burned (TCB) during exercise can be done. System proposed in this paper System can considerably improve existing infrastructure of Hospitals and Gymnasiums. Results of pivotal signs monitoring are accurate and energy estimations based on the system are reliable.

In [7] physiological parameters from multiple patient bodies is presented. System proposed by the author uses a coordinator node attached on patient body to organize all the signals wirelessly and sends them to the base station. The attached sensors are able to sense the heart rate, blood pressure etc. This system can detect the brachydactylous conditions, can issue an alarm to the patient and send a SMS/E-mail to the respective physician. The main benefit of this systems 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. The system developed in this paper is intended for multi-patient architecture for hospital healthcare and compared it with the other existing networks based on multi-hop relay node in terms of coverage, energy consumption and speed. Wireless BSN technology is nascent as a significant element of next generation healthcare services.

In [8] the system proposed uses ZigBee embedded technology in health-related monitoring applications to ease the feasibility of using it. Selected decisive discourse of patients are concretize using sensor nodes and readings are transmitted wirelessly using devices that utilize the ZigBee communication protocols. This system contains end units carried by patients that collect sensed data and transmit it to a coordinator unit at the hands of the floor nurse. Such wireless environments provide patients with the infidelity to move around and feel convinced when in the mood to spillage for a walk or inflate with in a pre-defined proximity. The effects are also taken to reduce the cost in health care. In this fine tuning is needed in the heart beat measurement.

CONCLUSION

The hospital automation has emerged with several demands, many of those devoted to

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information systems. This work presented solutions that use finger print technology as a mechanisms of interaction between user and the system. The use of finger print system improved the operational processors, because the solution proposed implemented the development of the system by changing the form of interaction with the user, but ensuring the same data entry. Thus, some problems have been solved, especially improving the quality & control of the automation of the clinic or hospitals. One can add more bio-medical sensor like blood pressure sensor, brain wave sensor, & other critical sensor; also we can have the entry record online for anywhere and any one can access the data.

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