Health Monitoring System by Using Iot

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Abstract

Healthcare monitoring system in hospitals and many other health centers has experienced significant growth, and portable healthcare monitoring systems with emerging technologies are becoming of great concern to many countries worldwide nowadays. The system proposes a smart healthcare system in IOT environment that can monitor a patient's basic health signs as well as the room condition where the patients are now in real-time. In this system, sensors are used to capture the data from hospital environment named heart beat sensor, body temperature sensor, room temperature sensor, CO sensor, and CO2 sensor, blood pressure etc. In the traditional approach the healthcare professionals play the major role. They need to visit the patient's ward for necessary diagnosis and advising. There are two basic problems associated with this approach. Firstly, the healthcare professionals must be present on site of the patient all the time and secondly, the patient remains admitted in a hospital, bedside biomedical instruments, for a period of time. In order to solve these two problems, the patients are given knowledge and information about disease diagnosis and prevention. Secondly, a reliable and readily available patient monitoring system (PMS) is required. The main objectives of this system is to transmitting the patient's health monitoring parameters through wireless communication Doctor and caretaker can access these values from cloud. Proposed outcome of the project is to give proper and efficient medical services to patients by connecting , collecting , recording , analyzing and sharing data information through health status monitors which we include patient's heart rate, blood pressure, body temperature, room temperature and send an emergency alert to patient's doctor with his current status and full medical information.

I. INTRODUCTION

Biomedical domain serves as the blissful for human society. But in day to day life people are careless about their health. Cases of heart attacks and various diseases deaths due to lack medical infrastructure increasing. For this purpose personal medical-kits are best solution. Few years ago, there was joint family system hence patients were able to get medical help in proper time. But nowadays one may lose his life due to not getting proper help within time. For such heart patients this medical kit gives indication to their doctors and they immediately get medical help. Whenever heart rate of person -exceeds more than 72 pulse/min, doctor get immediate indication and help will be sent as fast as can. Cardiovascular diseases are often very critical and high condition, the change is so rapid, the one attack can cause great suffering to patients, and even cause syncope or overtime. Especially coronary heart disease, arrhythmia, and cardiomyopathy history, and family history of sudden cardiac death, heart transplantation and other medical conditions, history of the disease has a sudden, random, high rate characteristics of overtime , usually after the acute onset of symptoms within one hour may cause death and malignant fibrillation within 12 minutes and even cause overtime in patients affected by serious heart condition in patients with the above mentioned is attack patients. Heart related disorders resulting from lack of coronary circulation, like as a heart attack, have been and likely will continue to be the most common reasons of death in the industrialized world. An estimated 4-5 million people suffer from heart attack per year. Approximately half heart attacks are SILENT meaning they're not felt by the patients. Half of the patients who sustain heart attacks die before arrival to hospitals. The present innovation, therefore relates to early detection and future monitoring of heart related Disorders.

The IOT including various of concepts from pervasive, ubiquitous, and ambient computing, which are evolved in last 20 years and present time its now reached at some level of maturity. The IOT is conceive as a network of Lacks of people, objects, machines-interacting to one other, invisibly connected with sensors, actuators, making useful in everyday lives. The future will be dominated by the 'Internet of Things' which will serve as a all world platform to interconnected physical objects, things, humans, thus, enabling new ways of working, communicating, interacting, entertaining, and livings.

The IOT is a new paradigm in which every physical object. Individuals with the heart condition who have been advised by their physicians to participating in a regular exercise program and it would beneficial from using the heart monitor so that they can be aware of their heart beat rate condition and adjust the level of intensity of their exercise to maintaining a safe and good heart beat rate. Individuals who are advised to exercise for weight losing , for treatment of high blood pressure also will enjoy this device because it may be a effective meaning of measuring progress in achieving exercise goals.

Healthy individuals who are interested in improving their cardiovascular condition can also use the heart monitor to guide their exercise program and increase the intensity of their exercise in a controlled manner. Thus, anyone who exercises regularly can benefit from the heart monitor.

II. LITERATURE REVIEW

In [1], the writer proposed that care is associate rising patient-centric model of health data exchange, that is typically outsourced to be keep at a third party, like cloud suppliers. However, there area unit wide privacy considerations as personal health data could be exposed to those third party server and to unauthorized parties. To assure the patients' management over access to their own cares, it is a promising principles and methods to code the care s before outsourcing. Yet, problems like risks of privacy exposure, quantifiability in key management, versatile access and economical user revocation, have remaining the foremost necessary challenges toward achieving fine-grained, cryptographically enforcing the information access management. Mr Sajjad, Hussain Talpur (2015), has currently a days there is want of a completely distinctive patient-centric framework and a gaggle of mechanisms for information access management to care s keep in semi-trusted servers.

[2] Extensive analytical and experimental results area unit conferred that show the protection , quantifiability and potency of our planned theme.

[3] Gaurav Sharma, Mehmet Aktas, Gonzalo Mateos, Burak Kantarci, Silvana Andreescu (2015), A project is initiated to subsume an honest spectrum of security problems among care by the european AIM/SEISMED Medicine/Secure surroundings for data Systems in medicine It conjointly provides sensible pointers for secure care institution.

[4]A report on personal health records (HealthCare) was revealed, aiming at developing care s and care systems to place forward to a vision that "would produce a private health records that patients, doctors and different health care suppliers might firmly access through the net in spite of wherever a patient is seeking treatment ."

III. SYSTEM DEVELOPMENT

3.1 Parameters to be monitored

1. Body Temperature

Body temperature may be a basic parameter, which has got to be monitored in a person . Body temperature measuring sensor fixed at a specific location of body and measures the temperature and transmitting the worth to the most coordinator.

During exercise, the blood heat isn't just one of the foremost important physiological indicators, but indicators also can be wont to determine the signs of warmth and warmth stroke. If the blood heat reaches (40 °C), heat stroke may occur, in order that monitoring of blood heat is important during exercise.

Variety of accidents caused by physical stress thanks to a scarcity of thermo regulation. Now a days, thanks to globalizing, athletes repeatedly demand maximum performances from their body under sometimes extreme climatic circumstances. Although in sports science it's already for an extended time known that blood heat is a crucial factor during the training and competition process Humans, as homeo- thermic (warm-blooded) beings, have a continuing operating temperature during a tolerance range of (37 °C to 0.5 °C) within the core body.

2. Body Postural & Movements

Monitoring the movements of the physical body is of such great importance in various applications fields including medicine, workout and sport. It is important to monitoring activity and movement for physical therapists to know the detecting the motion with inertial sensors for balancing and gait assessment and treatment in rehabilitation. By combining multiple sorts of (A 3-axis) accelerometer are often used together to make a convenient devices to be used in indoor, outdoor activities like adventure sports. Another severe issue associated with Elders is fall detection. Falls are often markers of poor health and declining function, and that they are often related to significant morbidity. Greater than 80 percentages of hip fractures occur as a results of falls, with mostly of those fractures occurring in persons above 70 years aged. Monitoring of bed ridden elders thus becoming very vital issue in maintaining proper health condition. Thus it requiring that the caretaker to watch the elder at regular intervals.

3. Heart rate & Blood oxygen level

Heart rate is another basic important parameter of a person's. High vital sign. or hypertension, is usually linked to conditions like heart attacks and strokes. In Sports heart-rate monitors are widely employed by professional trainers also as club-level athletes and enthusiasts in cardiovascular sports like running, swimming, and cycling are help to enhance sport performance. Blood oxygen saturation may be a measure commonly employed by healthcare professionals to see for conditions like anemia or correct operation of the heart . A poorly pumping heart is severe issue in an elderly community. the general activeness of heart reduces hence all the nerves and arteries get weaker.

4. Galvanic Skin Response

The GSR sensor measures changes in the surface resistance of the skin by releasing a current to the human body whereas the skin resistance (G) depends on the skin humidity, vasoconstriction and relaxation, the thickness of the stratum corneum, chemical substances. So, when persons mood changes or they feel discomfort, then the skin resistance value decreases. Therefore I am using the rate of change of GSR as the evaluation index for heat stroke, also it is used as a measurement of anxiety, which in terns can be used in the lie detection,

3.2 Functional block diagram of the system
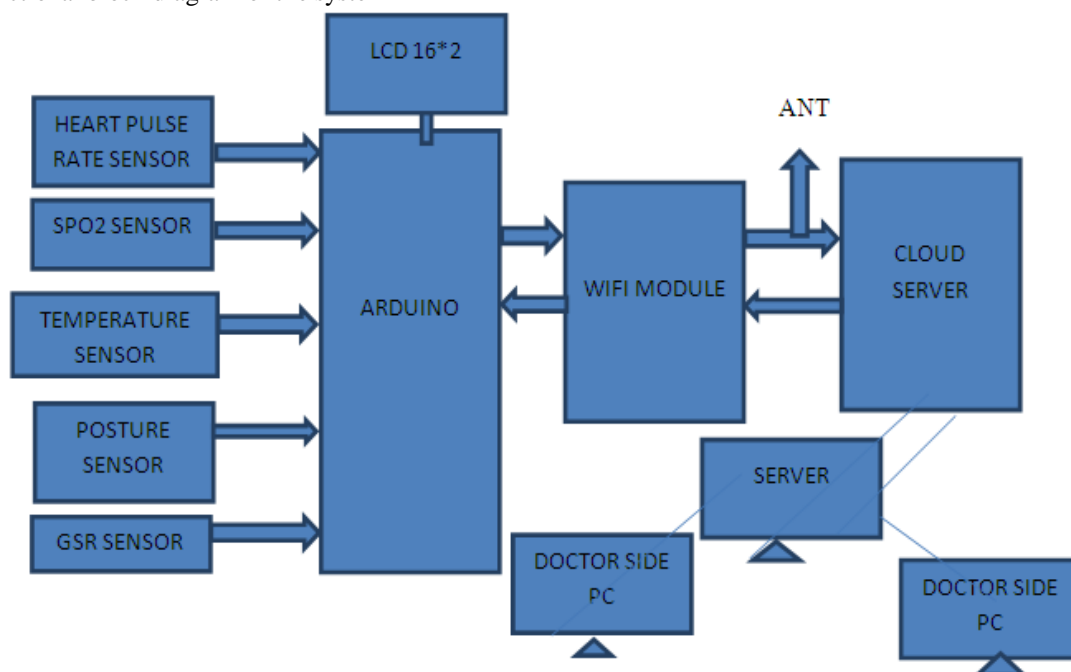
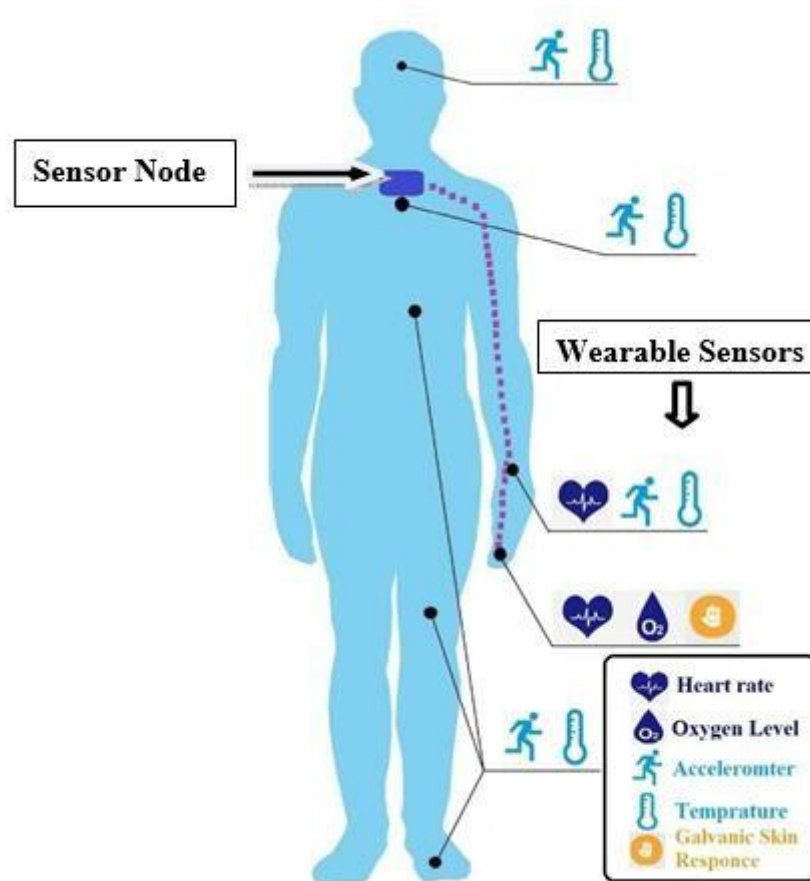**3.3 Sensors and their positioning on human body**

Figure 3.2: Various sensors and their placement on human body

Above figure shows that the Placement of sensor node and wearable sensors like Accelerometer, Temperature, Pulse Oxygen measuring instrument (SpO2) & Heart rate.

3.4 Wireless sensor network & selection of network:

WNS is a promising field that integrates sensor technologies, embedded system and wireless communication together to produce small, low cost, low power and reliable system capable of monitoring specific events. The IEEE standard 802.11 a/b/c is developed targeting specifically for this application domain. It has been used in a variety of applications including commercial and industrial monitoring, home automation and networking, consumer electronics, personal computer peripherals, home security, personal healthcare, toys and games, automotive sensing, agriculture etc.

The communication between sensor node and coordinator unit is wireless, data from the sensor node is monitor on IOT platform at the internet accessed host computer by building a network between the sensor node and the coordinator unit for that communication Wi-Fi wireless network technology id used. In our system design WiFi technology take into account because it is commonly used for the wireless local area networking (WLAN) of devices which is based around the IEEE 802.11 family of standards WiFi uses multiple parts of the IEEE 802 protocol family and is designed to seamlessly interwork with its wired sensor protocol ethernet.

Table 3.1: Comparison of various Wireless Technologies

Wireless Parameters	Bluetooth	Home RF	802.15.4 Wireless LAN	ZigBee	WiFi
IEEE connection type	802.15.1	Alternative of IEEE 802.15	802.15.1	802.15.4	802.11.a/b/c
Frequency spectrum	2.4 GHz	2.4 GHz	2.4 GHz	868/915Mh 2.4 GHz	2.4 GHz-5GHz
Data rate	1Mbps	1Mbps, 2Mbps	1Mbps, 2Mbps	250 Kbps	54Mbps
Node per network	7.8	127		64K	30

Range	10 meter	Typical home	100 Meter	10-100 meter	100 meter
Network topology	Ad-hoc, small network		Ad-hoc, peer to peer	Ad-hoc, peer to peer, star or mesh	Point to hub
N/W joint time	>3 sec	Variable	>30 ms	>30 ms	Variable, 1 sec typically
Application	Wireless device connection	High quality voice channel	Small in home networks to large school campus, office building ,etc	Industrial control & monitoring sensor N/W, Building automation, toys and game	Wireless LAN internet access

IV. CONCLUSION

A new approach for remote measurement and monitoring of the physical body parameters supported a wearable wireless sensor network has been presented. The proposed design will be able to effectively measure and monitor human body parameters collectively. The system uses wearable sensors, Wi-Fi standard wireless communication protocol for data transfer between the sensors node and coordinator. The coordinator allowing to transfer of knowledge from sensor nodes to the IoT cloud environment, which can allow monitoring of all physical body parameters on IoT platform effectively.

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