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PLEISTOGRAPHIC SENSOR INTEGRATION PULSE AND TEMPERATURE MEASUREMENT IN MEDICAL WI-FI AND ETHERNET NETWORKS

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ABSTRACT:

In this paper we advocate device architecture for clever healthcare based on a sophisticated Wireless Sensor Network (WSN). For last few years, challenges of monitoring and control of distant environmental parameters accurately has emerged as new field of research. The concept of Internet of Things (IOT) is also emerging very fast where everything around us comes with an internet connectivity for monitoring and control. Monitoring the environmental parameters and initiating a control action from internet is also part of this concept. In our proposed work, we design aPatient monitoring system, capable of monitoring and control of Patient parameters it specially targets assisted-residing citizens and others who may additionally advantage from non-stop, far flung fitness monitoring. We gift the blessings, objectives, and standing of the layout. An experimental dwelling space has been constructed at the Department of Computer Science at UVA for assessment. Early results mention an unqualified reasonable for WSNs to enlarge new research perspectives surely truck, lead enjoyment of multimodal sensors for a stepped forward formal high quality of penal care.

1. INTRODUCTION

AS the world's denizens a long time, those plagued by diseases of you're been around choice make bigger. In-residing residence and retirement home conventional networks may also assist residents and their caregivers through offering looped healing tracking, hint enrichment, preserve watch over of home equipment, prophylactic testimony get right of access to, and quandary

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verbal exchange. Researchers in mini, netting equipment, and tonic fields are engaged to fabricate the sweeping imagination of smart healthcare you'll [1-8]. For sample, a number of conservatives support on a treadmill narcotic monitoring for declinator illnesses appreciate Alzheimer's, Parkinson's or twin balanced disorders [6]. Other projects similar to "Code Blue" at Harvard extend WSNs for sedative programs in failures [7]. Some cognizance on high-bandwidth, sensor-wealthy environments [2]. This paper provides an emerging system layout orientated around faraway, uninterrupted narcotic tracking using Wi-Fi sensor networks. Its advantages for in-home monitoring are specified within the subsequent section. Parts II and III cope with our lengthy-time period objectives and final architecture, while elements IV and V construe our river employment and prelims outcomes. Section VI discusses a variety of developing evaluation subjects

2.OUR MAIN GOALS

We are developing system morphology for active lustiness care near the intention to open up new opportunities for continuous tracking of assisted and unbiased-house citizens [9, 10]. While keeping resident comfort and privateers, the tracks manages continuous medical records. Unobtrusive region and setting sensors integrate upon wearable interactive devices to evaluate the fitness of squares and the who inhabit them. Authorized care carriers may additionally monitor residents' strength and existence behavior and watch for continual pathologies. Multiple sufferers and their resident circle of relative's contributors in addition to visitors are differentiated for sensing tasks and get right of entry to privileges. High prices of arrange and retrofit are prevented by means of your usage of advert hoc, self-managing reticules. Based on the essential factors of future medical programs (integration by current logical practice and technology, problem-solving time and long-term monitoring, wearable sensors and help to chronic sick persons, elders or physically disabled biped beings), our Wi-Fi gimmick power enlarge robustness care deriving out of the unwritten accurate health facility placing to tending and separateness homes, licensing tablewareincluding out the steep costs of retrofitting current systems. indicates the geography of your empirical research laboratory. The format is multi-

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tiered, along different gizmos starting against light-weight sensors, to cellphone components, and additional impressive desk bound widgets. The advantages of a WSN are severe for nimble healthfulness care, because it gives the next crucial houses:

1. Portability and unpretentiousness. Small devices flock whole story and symposium wiresubtractingly, working among basal shut-in dossier. They might be toted on the body or intensely inserted inside the ecosystem. Unobtrusiveness enables upon inmate heyday and minimizes confounding depth importance. Since monitoring ride out alongside inside the dump city, the sick person travels secondary of times that is safer and additional on hand.

2. Ease of grouping and scalability. Devices may well be deployed in potentially heavy portions near greatly shortened multiplicity and value when compared with under pressure tracks. Existing houses, principally unkempt anyone, might be along out inconvenience augmented for a WSN associate considering stressed out installations may be expensive and unreal. Devices are positioned within the habitation distance and grew to turn into on, self-organizing and calibrating naturally.

3. Real-time and usually-on. Physiological and surroundings data may well be monitored all the time, allowing actual time echo through the use of pressure or form care employees. The records imperturbable become a hardiness broadside, and are treasured for pad in gaps among inside the moral troubled man narrative. Even supposing the organization as a whole is all the time-on, man or woman sensors nonethemeagerly have to conserve strength via shrewd electricity control and on-demand activation.

4. Reconfiguration and self-organization. Since there is no constant installation, including and removing sensors instantly reconfigures the community. Doctors may additionally re-goal the project of your web as clinical desires exchange. Sensors self-organize to organize routing paths, cooperate on inappearation processing, and arrange hierarchies.

3.LITERATURE REVIEW:

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In "Medical Applications of Wireless Networks" Sensor based technology has invaded the medical devices with a wide range of devices available today with wireless network capability, which have the potential to replace thousands of wires connected to devices found in the hospitals. This technology has the capability of providing the reliability with enhanced mobility. It is being looked upon as alternative solution to provide low cost medical solution along with enhanced accessibility to the patients in view of permanent usage of wireless devices. In this survey paper background of applications of wireless networks in the medical field and the issues and challenges involved in this technology transforming lives of several people who are deprived of quality health care facilities are discussed. Finally architecture for this communication system is discussed

In "Performance Evaluation of a Wireless Body Area Sensor Network for Remote Patient Monitoring" In recent years, interests in the application of Wireless Body Area Network (WBAN) have grown considerably. A WBAN can be used to develop a patient monitoring system which offers flexibility and mobility to patients. Use of a WBAN will also allow the flexibility of setting up a remote monitoring system via either the internet or an intranet. For such medical systems it is very important that a WBAN can collect and transmit data reliably, and in a timely manner to the monitoring entity. In this paper we examine the performance of an IEEE802.15.4/Zigbee MAC based WBAN operating in different patient monitoring environment. We study the performance of a remote patient monitoring system using an OPNET based simulation model.A Wireless Body Area Network (WBAN) WBAN based on a low cost wireless sensor network technology could greatly benefit patient monitoring systems in hospitals, residential and work environments [1]. A WBAN system allows easy internetworking with other devices and networks, thus offering health care worker easy access to patient's critical and non-critical data. One of the main advantages of a WBAN is to monitor patients remotely using an intranet or the internet. A WBAN could be seen as a special purpose wireless sensor network with a number of additional system design requirements. A WBAN is mostly likely to incorporate wearable and implantable node operating in two different frequencies. An

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implantable node is most likely to operate at 400 MHz using the MICS medical band whereas the wearable node could operate in ISM/UWB or some other band.

In "ZigBee- Based Wireless Homecare System Implementation" The aging speed of the population. in Taiwan has been rising rapidly over the past decade. According to the official census, 77% of elderly people have one or more chronic diseases and most of them prefer to stay at home for the rest of their lives rather than go to long term care institution or nursing home. Based on this reason, it is urgently necessary to have a home health care system to monitor the health status of the elderly and provide some medical recommendation and remind the family members in case of health abnormality. The traditional home care system was sensor independent or used RS232 connector to link with computer to manage the vital signs. These biosensors were fixed at some place and less mobile. The paper is to use ZigBee based wireless devices to integrate the biosensors to monitor the vital data such as body temperature, blood pressure, heart rate and SPO2 at anytime and anywhere. The proposed home care system not only can popup alerts if the vital data is abnormal but also can send the email and simple message to notice the default family members

In "ZigBee Wireless Sensor Networks and Their Applications" The rapid progress of wireless communication and embedded micro-sensing microelectromechanical systems (MEMS) technologies has made wireless sensor networks (WSN) possible. A WSN consists of many inexpensive wireless sensors, which are capable of collecting, storing, processing environmental information, and communicating with neighboring nodes. In the past, sensors are connected by wirelines. With the development of ad hoc networking technologies, tiny sensors can communicate through wireless links in a more convenient manner (Pottie and Kaiser, 2000; Sohrabi et al., 2000). A lot of applications of WSN have been proposed. For example, wildlife monitoring applications are discussed in (FireBug 2004; GreatDuckIsland 2004) and mobile object tracking issues are addressed in (Lin and Tseng, 2004; Tseng et al., 2003). How to ensure network coverage/connectivity is discussed in (Huang et al., 2005; Yan et al., 2003). Guiding applications based on wireless sensor networks are presented in (Li et al, 2003; Tseng et al.,

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2006). Applications of mobile sensors are presented in (Tseng et al., 2005). Many WSN platforms have been developed, such as MICA2, MICAz, TelosB MOTE (Xbow, 2005), and Dust Network (DustNetworks, 2005). To allow different systems to work together, standards are needed. ZigBee/IEEE 802.15.4 protocols are developed for this purpose. ZigBee/IEEE 802.15.4 is a global hardware and software standard designed for WSN requiring high reliability, low cost, low power, scalability, and low data rate. Table x.1 compares ZigBee/IEEE 802.15.4 against several other wireless technologies. The ZigBee alliance (ZigBee, 2004) is to work on the interoperability issues of ZigBee/IEEE 802.15.4 protocol stacks. The IEEE 802.15 WPAN Task Group 4 (IEEE Std 802.15.4, 2003) specifies physical and data link layer protocols for ZigBee/IEEE 802.15.4. The relationship of ZigBee and IEEE 802.15.4 is shown in Fig. x.1. In the current development, IEEE 802.15 WPAN working group creates two task groups 15.4a and 15.4b. The former is to specify an alternate physical layer, the ultra wide band (UWB) technologies. The latter is to enhance the IEEE 802.15.4 MAC protocol so that it can tightly couple with the network layer functionalities specified by ZigBee. ZigBee alliance published the version 1.0 standard in Dec. 2004.

In "ZigBee Wireless Sensor Applications for Health, Wellness and Fitness"As we have renowned hospitals all over the world, but still there is a need of better health care monitoring system. The ratio of staff in the hospitals is less than the total number of patients; hence this system proposes a better solution to raise the standard of existing continuous patient health monitoring system. Continuous patient monitoring needs frequent measurement of the associated health parameters status. The wireless Technology used here is Zigbee. For this, sensors are used to monitor the patient continuously over long period of time until the abnormal condition is detected. Once detected, the collected data is sent securely via Zigbee to the physician taking care of that particular patient for further analysis. If a mismatch occurs, a buzzer alarm is issued and the results will be displayed on LCD and Laptop display. Hence, the main goal is to alert hospital staff in case of emergency during abnormal conditions.

4.IMPLEMENTATION:

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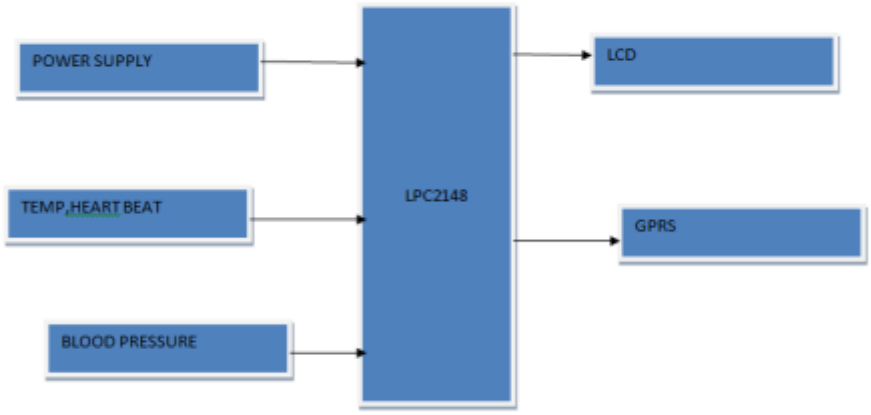

Fig: Block diagram

owadays, time is a very valuable resource and can make the difference between life and death. Having knowledge about this fact we decided to deal with one of the most important aspects of contemporary medicine, EMS (emergency medical services) response time. Modern systems that encourage intelligent communication methods between medical devices and doctors are a must in ubiquitous health care environments. Auxilum Medicine fosters a triple-win situation regarding the relationship between medical institutions, doctors and patients. Emergency patients should be treated with utmost care because their life is hanging by a thread if nobody is present to take immediate action. We are presenting a platform which enables doctors to simultaneously monitor a large number of patients from different physical locations. By receiving real time notifications, medical history, prevention alarms directly to any network connected devices (mobile phones, tablets, desktops, notebooks, smart watches, etc.), the medical staff can act promptly, exactly when and where it is needed in order to save human lives. Our solution's architecture allows gathering data from any medical signal processing unit and sends it straight to the cloud using encrypted communication protocols. What makes Auxilum Medicine unique refers to the cloud integration with hospital departments' structure, awareness of different medical staff roles and capabilities, privacy data interest, updates sent to patient's relatives as well as a modern responsive adaptive user interface. As a part of our experiment, aimed for testing our platform's capabilities, we have built a biomedical wireless sensor wearable device

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that provides real-time parameters (temperature and heart rate). Such a system favors medical equipment real time monitoring by using cloud services and permanently keeps alive the link between doctors and their patients, drastically increasing the EMS response time.

RESULTS:

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CONCLUSION AND FUTURE SCOPE:

The availability of low-chip asymmetric microcontrollers and the progress of Bayan's Wi-Fi engineers have encouraged the design of low-cost structures as an integral part of health monitoring programs. These systems have the ability to generate real-time alerts generated from biometric sensors and transmit measured signals through the telephone of the affected person to the server of the Scientific Center. At the destination we intend to strengthen the Ampopot hardware to a comprehensive integral and sustainable one-way architecture. We also recall the enhancement of the robotic robot tool for more collaborative performance. So let's not forget modern robotic mobile processing, with an unmanned robotic partner that can fly in conjunction with the contemporary machine to perform faster, as well as working in the highlands.

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