

Wireless Sensor Network : Healthcare

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Abstract

Due to advance in wireless and network in electronics, we can have the emergence of wireless sensor network (WSN). There are much possibilities for changing the future through most important technology.

In advance wireless sensor network (WSN) have opened up new possibilities in healthcare system. In this paper we present the ideas to improve healthcare system in India with the help of telecommunication and information technology.

Key words: Future trends, recent advances, research challenges, wireless sensor networks

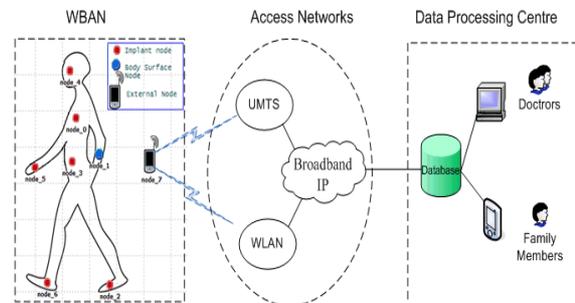
Introduction :-

Globally, the elderly population is growing and those suffering from diseases is increasing in the developed countries. It is one of the big challenges of the world. Life expectancy continues to increase with new techniques in health care. A large number of applications including medical care, habitat monitoring, precision agriculture, military target tracking and surveillance, hazardous environment exploration and monitoring are all using this technology.

In healthcare service wireless sensor network is coming technology for early detection of emergency conditions by monitoring the health parameters.

WWBAN ARCHITECTURE

WWBANs are a pivotal part of a multi-tier telemedicine system. Encompasses a number of wireless medical sensor nodes that are integrated into a WWBAN.



Each sensor node can sense, sample, and process one or more physiological signals. For example, an electrocardiogram sensor (ECG) can be used for monitoring heart activity of any person, an electromyogram sensor (EMG) for monitoring muscle activity, an electroencephalogram sensor (EEG) for monitoring brain activity, a blood pressure sensor for monitoring blood pressure, a tilt sensor for monitoring trunk position, and a breathing sensor for monitoring respiration; and motion sensors can be used to discriminate the user's status and estimate her or his level of activity.

Requirements for Wireless Medical Sensors:

A wireless sensor network consists of a large number of wireless-capable sensor devices working collaboratively to achieve a common objective. A WSN has one or more sinks (or base-station) which collect data from all sensor devices. These sinks are the interface through which the WSN interacts with the outside world.



WSNs are interacting with their environment through various sensors, WSN are processing information locally, and WSN are communicating this information wirelessly with their neighbors.

Monitoring health of structures:

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.

Assist in medical procedures:- The possibilities for wearable medical technology seem infinite. Surgeons wearing Google Glass can give other physicians and medical students the perfect point of view during surgical and medical procedures, and Glass has already been implemented in training. In fall 2013, a surgical team at the University of Alabama at Birmingham used VIPAAR (virtual interactive presence in augmented reality) technology in conjunction with Google Glass during surgery. By merging these technologies, surgeons could interact and see both sets of hands in the surgical field. This type of “telemedicine” enhances patient care by granting veteran surgeons opportunities to provide valuable expertise remotely to less-experienced surgeons.

Monitoring of Patients in Clinical Settings:- Wireless medical sensor networks are becoming increasingly most important for patients monitoring in the clinical system. Sensors today are effective for single measurements, these are not made up for a “complete body area network”, where many sensors are working at the same time on an individual patient. At the Interventional Center, in Oslo University Hospital, they have designed, implemented and tested a biomedical wireless sensor network (BWSN). The BWSN give simultaneous use of six different sensors.

1. Medical UWB-IR radar(Novelda)
2. DigiVent Pulmonary Air Leakage(Millicore)
3. WirelessPressureTransducer(Memscap)
4. Heart Monitoring Accelerometer(VTT)
5. SpO2 & Temperature sensors(SINTEF)

Recent Advances in wireless sensor network:-

Recent advances in wireless system have a expanse range of applications of WSNs in military sensing, traffic inspecion, target tracking, environment monitoring, healthcare monitoring.

we describe some type advances in WSN: _

Sensor Localization and LocationAware Services(Smart Home/Smart Office, Military, Industrial & Commercial, Traffic Management and Monitoring, Structural Healthcare, Agriculture), Quality of Service (QoS) Provision, Mobility management, Security and Privacy Concern, Biomedical/Medical.

Future Trends in wireless sensor network :-

Cognitive Sensing, Spectrum Management, Underwater Acoustic Sensor Systems, TimeCritical Applications, Experimental Setup and New Applications, New Models and Architectures, Holes Problem, Time Synchronization Problem.

Concluding Remarks:- This paper studied the application of WSNs in the healthcare system. The application of the Wireless Sensor Networks in healthcare systems was divided into some categories: monitoring of patients in clinical settings, assist in medical procedures, and requirements for Wireless Medical Sensors.

Wireless Sensor Networks applications in healthcare are being researched and deployed all over world. With the rise of these applications, implications will also arise.

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