Real-Time Patient Health Monitoring and Alarming Using Wireless-Sensor-Network

Abstract:

The main objective of this research is design and realization of real-time monitoring and alarming system for patient health, especially for patients suffering from diseases during their normal life. The proposed system has an embedded microcontroller connected to a set of medical sensors (related to the patient case) and a wireless communication module (Bluetooth). Each patient is considered as a node in a wireless sensor network and connected to a central node installed at the medical center through an internet connection. The embedded microcontroller checks if the patient health status is going well or not by analyzing the scanned medical signals. If the analysis results are abnormal, the embedded unit uses the patient's phone to transmit these signals directly to the medical center. In this case, the doctor will send medical advice to the patient to save his/her life.

Existing system:

Real-time measurement of health parameters of critically ill patients such as heart rate, blood pressure, blood-oxygen saturation, temperature, and many other parameters has become a common feature of the healthcare monitoring system. There are many monitoring systems in medical centers used to collect and monitor patient's health. The health data are then used by doctors to generate the suitable
decision. Critically ill patients require accurate monitoring and alarming system during their normal life.

**Disadvantage:**

- The disadvantage of this system is that every detail of the patient must be monitored manually.
- It may not work if the wireless infrastructure of the system gets changed.

**Block Diagram:**

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POWER SUPPLY

HEART BEAT SENSOR
TEMPERATURE SENSOR
ECG SENSOR

MICRO CONTROLLER

BLUETOOTH INTERFACE
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**Proposed system:**
The general layout of the whole system architecture is composed of an embedded sensing unit, a personal server, a medical centre server and a reliable wireless communication channel. Embedded sensing unit is a microcontroller interfaced with sensors and Bluetooth module for wireless communication. For embedded healthcare monitoring system design, small, reliable, and low power medical sensors should be considered. The number and type of the medical sensors are depending on patient health state. Typical medical sensors like Temperature, Heart beat and ECG Sensor is used.

**Advantages:**

- Helps in early detection of patient’s illness.
- Accurate in scanning, clear in monitoring, intelligent in decision making and reliable in communications are achievable.

**Conclusion:**

The availability of low-cost single-chip microcontrollers, and advances in wireless communication technology has encouraged engineers to design low-cost embedded systems for healthcare monitoring applications. Such systems have ability to process real-time signals generated from biosensors and transmit the measured signals through the patient's phone to the medical center's server.
Reference:


