Healthcare Monitoring System using GSM and GPS
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Abstract:
Health monitoring systems have rapidly evolved recently, and smart systems have been proposed to monitor patient current health conditions, in our proposed and implemented system, we focus on monitoring the patient’s blood pressure, and his body temperature. Based on last decade statistics of medical records, death rates due to hypertensive heart disease, shows that the blood pressure is a crucial risk factor for atherosclerosis and ischemic heart diseases; thus, preventive measures should be taken against high blood pressure which provide the ability to track, trace and save patient’s life at appropriate time is an essential need for mankind. Nowadays, Globalization demands Smart cities, which involves many attributes and services, such as government services, Intelligent Transportation Systems (ITS), energy, health care, water and waste. This paper proposes system architecture for smart healthcare based on GSM and GPS technologies. The objective of this work is providing an effective application for Real Time Health Monitoring and Tracking. The system will track, trace, monitor patients and facilitate taking care of their health; so efficient medical services could be provided at appropriate time. By using specific sensors, the data will be captured and compared with a configurable threshold via microcontroller which is defined by a specialized doctor who follows the patient; in any case of emergency a short message service (SMS) will be sent to the Doctor’s mobile number along with the measured values through GSM module. Furthermore, the GPS provides the position information of the monitored person who is under surveillance all the time. Moreover, the paper demonstrates the feasibility of realizing a complete end to- end smart health system responding to the real health system design requirements by taking in consideration wider vital human health parameters such as respiration rate, nerves signs etc. The system will be able to bridge the gap between patients - in dramatic health change occasions- and health entities who response and take actions in real time fashion.

I. INTRODUCTION
The system will track, trace, monitor patients and facilitate taking care of their health; so efficient medical services could be provided at appropriate time. By using specific sensors, the data will be captured and compared with a configurable threshold via microcontroller which is defined by a specialized doctor who follows the patient; in any case of emergency a short message service (SMS) will be sent to the Doctor’s mobile number along with the measured values through GSM module. Furthermore, the GPS provides the position information of the monitored person who is under surveillance all the time.

Moreover, the paper demonstrates the feasibility of realizing a complete end to- end smart health system responding to the real health system design requirements by taking in consideration wider vital human health parameters such as respiration rate, nerves signs etc. The system will be able to bridge the gap between patients - in dramatic health change occasions- and health entities who response and take actions in real time fashion.

II. MOTIVATION
➢The existed system only calculates and displays the vitals of the patient and does not help in continues monitoring and hence the proposed work helps in that and that too in a very efficient way.
➢The proposed system will send the message to the doctor and nurse through GSM which will actually help in monitoring the patient remotely.

III. LITERATURE SURVEY
Mikhail St-Denis, designed Life line project that can monitor heart rate, blood sugar levels, human’s body temperature, and by using a wireless communication technologies to synchronize and display these information into a smart mobile phone or a standard computer. Such device gather data from user and display some related graphs in order to encourage users to remain aware of their health conditions by providing a week to week feedback. Eli Hariton, designed Gluco (M) wristband which monitors the blood glucose levels. LUMO BodyTech (2011), created a platform for tracking human biomechanics, starting with a unique sensor-based solution for posture and back pain. This solution is comprised of a discreet biomechanics- monitoring sensor, an engaging mobile app, and intelligent algorithms for a personalized user experience. Patent-pending solution harnesses the power of human movement data to provide real-time actionable feedback and to enable healthy behaviors. Dr. Sailesh Chutani (2009), founded a Mobisante for ultrasound imaging that will be displayed. Health care workers in remote. Locations can check pregnant women, monitor a baby’s health, examine patients for heart and lung problems, and triage other problems. Their phone can then transmit the images to a hospital for consultation. In this PROJECT, a tracking system will be designed and implemented for monitoring heart rate and body temperature.

V. REQUIREMENT ANALYSIS AND DESIGN
A. FUNCTIONAL REQUIREMENTS
1. The system should provide user with definitive values of blood pressure, temperature, heartbeat
2. The system shall record continuous values from the sensor.

3. The system shall report any abnormalities via GSM to the doctors or caretakers.

4. Reported abnormalities location should be send via help off GPS.

5. The system shall alert the nearby nurse if the doctor is not nearby, so that the nurse can take the required action.

6. BP, Heartbeat, Temperature if in normal range should not be reported.

**B. NON FUNCTIONAL REQUIREMENTS**

**EFFICIENCY**
The system is very efficient and the alert messages are sent within 1-2 seconds and since the system uses GSM, the system can cover a large area.

**RELIABILITY**
The system is highly reliable as the sensors used are highly rated and reliable and hence do not compute false value which can bring the system reliability under a question mark.

**PORTABILITY**
The proposed system is portable and the communications are done using GSM, but the sensors are not wireless.

**USABILITY**
The proposed system is easy to use even for a Layman as the patient only has to place the sensor and does not have to worry about the readings as any unusual readings are reported.

**C. SYSTEM ARCHITECTURE**

Figure 1. System architecture

Figure 2. Power Supply

**Figure 3. Use Case Diagram**

**D. ASSUMPTION**
- The blood pressure sensor assumes the normal blood pressure in range of 30 to 70.
- The blood pressure which is calculated and displayed here upper one and the normal is not 120 as the sensor is not realtime.
- Delay is considered between 2 messages (i.e. message to doctor and nurse)

**V. RESULTS**
The system generates values for blood pressure, heartbeat and temperature. Any abnormalities if observed are reported directly through a message via GSM and the location is traced and the needful is done for the patient.
V. SCOPE
It is a system which can measure heartbeat rate and body temperature and communicate them in cases of extraordinary behaviors to supervision medical entities using GSM, GPS and web technologies to deliver immediate actions to rescue patients life with potentiality in the future to add other vital factors measurements according to available sensor in the market which can achieve the objective of providing a reliable effective application for real time health monitoring and tracking. There have been Systems for the same purpose but not as effective as the expected system.

VII. REFERENCES


