Body Area Network For Human Health Care Monitoring System Using GSM Modem

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ABSTRACT

Body Area Network (BAN) is a technology that allows communication between ultra-small and ultra-low power intelligent sensors/devices that are located on the body surface or implanted inside the body. Wireless body area network allows the data of a patient's vital body parameter and movement to be collected by small wearable or implantable sensors. This paper presents for monitoring the athletes' heart rate during training or exercise session. Developing a hardware which will sense heart rate and blood pressure, temperature of a person, motion sensor, respiration of the person, using gsm modem all information lively transmitted to gsm mobile.

I.INTRODUCTION

Body Area Network (BAN) is a technology that allows communication between ultra-small and ultra-low power intelligent sensors/devices that are located on the body surface or implanted inside the body. In addition, the wearable/implantable nodes can communicate to a controller device that is located in the vicinity of the body. These radio-enabled sensors can be used to continuously gather a variety of important health and/or physiological data (i.e. information critical to providing care) wirelessly. The networking ability between these body devices and possible integration with existing IT infrastructure could result in a pervasive environment that can convey health-related information between the user's location and the healthcare service provider. Radio-enabled implantable medical devices offer a revolutionary set of applications among which we can point to smart pills for precision drug delivery, intelligent endoscope capsules, glucose monitors and eye pressure sensing systems. Similarly, wearable sensors allow for various medical/physiological monitoring (e.g. electrocardiogram, temperature, respiration, heart rate, human motion and blood pressure), disability assistance, and human performance management. This device could administer just the right amount of insulin to a diabetic person based on wirelessly received glucose level measurements from another body sensor.The normal data is collected and processed by the coordinator. Depending on the application requirements, the coordinator may contain a wake-up radio circuit to accommodate life-critical events.

Now days, the use of heart beat rate monitoring used at the hospital. Generally, person who meets heart attacks and cardiac diseases needs to cares about their heart to ensure that they have a normal heart beat rate. The early detection of the abnormal heart beat rate can help them to prevent from the serious condition. For athletics the heart beat rate monitor is needed to check the normal heart beat range while

II. DESIGN METHODOLOG

In this section, the application of GSM transmission medium as a communication protocol tool is described. This application between transmitter and receiver the work for designing the prototype that communicates receiving through radio waves. The work starts by gathering all the data and information needed from the GSM mobile. The PIC 16F877 microcontroller is used due to the small power has a surface amount microcontroller and serial port interface (*SPI*).The data that have been processed by microcontroller will be displayed through an LED indicator. This LED indicators we able to show the different colors that indicate the range of heart rate. Blood pressure, motion rate, temperature rate, respiration rate. The data from the microcontroller is also sent to the GSM

Wireless network connected to the microchip Sim 300. Instead of using GSM modem transmission medium. It used to control and program the heart rate data that had been received from

GSM transmission medium, the microcontroller is used. The complete block diagrams of heart rate monitoring. We know the normal value of the human body. But incase abnormal state means LED make the different light signal and at that time GSM send the SMS received in particular mobile.

A.TEMPERATURE SENSOR

The normal body temperature of a person varies depending on gender, recent activity, food and fluid consumption, time of day, and, in women, the stage of the menstrual cycle. Normal body temperature can range from 97.8 degrees F (or Fahrenheit, equivalent to 36.5 degrees C, or Celsius) to 99 degrees F (37.2 degrees C) for a healthy adult.

Temperature varies cold:
7°C (98.6°F) - Normal body temperature (which varies between about 36-37.5°C (96.8-99.5°F)

36°C (96.8°F) - Mild to moderate shivering.

34°C (93.2°F) - Severe shivering, loss of movement of fingers, blueness and confusion.

33°C (91.4°F) - Moderate to severe confusion, sleepiness, depressed reflexes

32°C (89.6°F) - (Medical emergency) Hallucinations, delirium, complete confusion

31°C (87.8°F) - Comatose, very rarely conscious. No or slight reflexes.

28°C (82.4°F) - Severe heart rhythm disturbances

Temperature varies Hot:
37°C (98.6°F) - Normal body temperature (which varies between about 36-37.5°C (96.8-99.5°F)

38°C (100.4°F) - feeling very not well

39°C (102.2°F)- Severe sweating, flushed and very red. Fast heart rate and breathlessness.

40°C (104°F) - Fainting, dehydration, weakness, vomiting, headache

41°C (105.8°F) – There are not thinking well.

42°C (107.6°F) - Subject may turn pale or remain flushed and red.

43°C (109.4°F) - Normally death, or there may be serious brain damage

44°C (111.2°F) or more - Almost certainly death will occur; however, patients have been known to survive up to 46.5°C (115.7°F).

B.RESPIRATION SENSOR

The respiration rate is the number of breaths a person takes per minute. The human body normally respiration rate will be low or high .At the time measures human breath. The rate low or high means sum disease occur in body.

Normal respiration rates for an adult person at rest range from 12 to 16 breaths per minute.

— Normal respiration rates for an adult person at rest range from 12 to 16 breaths per minute
- birth to 6 weeks: 30–60 breaths per minute
- 6 months: 25–40 breaths per minute
- 3 years: 20–30 breaths per minute
- 6 years: 18–25 breaths per minute
- 10 years: 15–20 breaths per minute

Figure 1   respiration sensor

C.BLOCK DIAGRAM
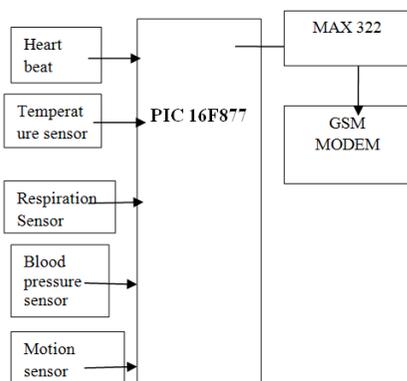
D.HEART BEAT SENSOR

For a human aged 18 or more years, a normal resting heart rate can be anything between 60 and 100 beats per minute.Usually the healthier or fitter you are, the lower your rate. A competitive athlete may have a resting heart rate as low as 40 beatsperminute. Champion cyclist, Lance Armstrong has had a resting heart rate of about 32 beats per minute (bpm). Fellow cyclist Miguel Indurain once had a resting heart rate of 2bpm. According to the National Health Service, UK, the following are ideal normal pulse rates at rest, in bpm (beats per minute):Newborn baby - 120 to 160

· Baby aged from 1 to 12 months - 80 to 140
   Baby/toddler aged from 1 to 2 years - 80 to   Toddler/young child aged 2 to 6 years - 75 to
· 120
· Child aged 7 to 12 years - 75 to 110
· Adult aged 18+ years - 60 to 100
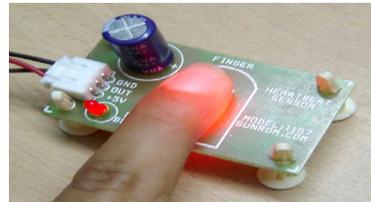· Adult athlete - 40 to 60

Figure 2 heart beat sensor

E.GSM MODEM

GSM modem is a global system for mobile communication. A wireless modem behaves like a dial-up modem. A GSM modem in the form of a PC Card / PCMCIA Card is designed for use with a laptop computer. As mentioned in earlier sections of this SMS tutorial, computers use AT commands to control modems. You can use a GSM modem just like a dial-up modem. These extended AT commands are defined in the GSM standards. With the extended AT commands, you can do things like

·   Writing SMS messages.
·   Sending SMS messages.
·   Monitoring the signal strength.
·   Monitoring anywhere in the world and control the system.
·   In this GSM display the abnormal status SMS

III. RESULTS AND DISCUSSIONS

Currently, the prototype of body area network for heart rate monitoring system is successfully designed for applications using GSM.and ANT+. For heart beat is used to measure the heart beat and tracks heart beats per minute continuously. Figure 2 shows.
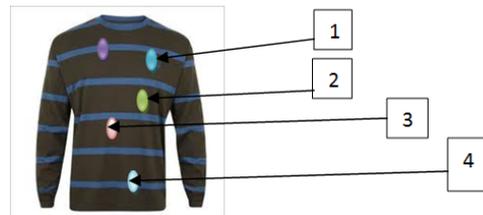

Figure 3 output

1. Heartbeat sensor
2. Temperature sensor
3. Respiration sensor
4. Blood pressure sensor
5. Motion sensor

We have design the t-shirt for wearing the sports person during the training or exercise. This consista microcontroller, gsm modem, heartbeat, temperature, respiration sensors, motion sensor, and blood pressure sensor. This t-shirt will be provided all athletes person to monitor the heartbeat, temperature, respiration, motion, and pressure.

IV. CONCLUSIONS

In this project real time implemented means human is very important in the world. So that prevently detect disease and also use medical field. Every country importance in the sports.so that here we are using the athletes or sports person monitoring the whole body in this project. Generally, heart rate monitor was used by a person who cares about their heart to ensure that they have a normal heart rate.   The early detection of the abnormal heart rate can help to prevent from the serious disease. In the sport field, the heart rate monitor is needed to determine the range of heart rate.

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