

SMART HUMAN BODY MONITORING SYSTEM USING ARDUINO

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ABSTRACT

The healthcare monitoring system is one of the most important systems from the last decade. It is emerged as technology oriented system. Due to lack of timely medical care to the individuals who are suffering from various diseases and they become ill and it leads to unexpected death of the patients. All people in this COVID condition are very concerned about maintaining their health. Our initiative is set up to provide essential medical care without a doctor's assistance. IoT is quickly transforming the healthcare sector thanks to a proliferation of new healthcare technology start-ups. We created the Human Body Monitoring System for this project. GSM is the communication tool utilized in this project. Both the surrounding temperature and the heart rate could be read by this instrument. It continuously measures the ambient temperature and pulse rate and sends SMS updates. The project's many features are implemented by the Arduino Sketch running on the device. These include reading sensor data, stringifying them, feeding them to the device, and displaying measured pulse rate and temperature on a character LCD.

Keywords- monitoring, sensors, measuring, pulserate, temperature, sms, microcontroller.

I. INTRODUCTION

GSM based Patient Health Monitoring System makes it possible for Physicians or person's kith and kin to check on a person's health remotely. The person's heart beat rate and thermic are calculated by system, and if they exceed a certain threshold, an immediate and informative alarm message is delivered to the registered number. We utilized an Arduino board for this system, which has interfaces for an Liquid Crystal display, a heartbeat sensor, and a temperature sensor. Patient Health Monitoring System, which is powered by a power source, uses a GSM modem to transfer information distantly to the mentioned number. This system also has manual health button, which the patient can use to contact a doctor if they have any other problems. As a result, the system is incredibly beneficial for preserving the patient's life. It also gives a method using which a Physician will able to see the condition of person after some peroid of time by conveying message. This technology precisely estimates the patient's health parameter and effectively updates the doctor on the patient's condition.

II.EXISTING SYSTEM

In a Clinic, either the attender or the Physician has to walk from one people to another for checking the condition, which won't be feasible to asses everyone's conditions all the time. Without a quick check of the patient's health by a nurse or doctor, any critical problems cannot be quickly identified. For the doctors who are caring for a large number of patients at the hospital, this could be challenging. Also, when some critical conditions happen to the person, they are mostly not in normal condition and won't be able to press an Emergency Alert Button.

The Existing system uses temperature sensor and heart beat sensor to measure the temperature and BPM and display them on the LCD. Sensors like LM35 sensor, Heart Beat Sensor gets input from human body. These sensors are connected with a common Arduino uno .The range of sensor is monitored by using Arduino code uploaded in the arduinouno. LCD display board is connected with the Arduino board to display the output. The Temperature , spO2 rate and Pulse rate is detected using the respective sensors and the input data is collected by the Arduino . Through the Arduino code if any of the input date exceeds the normal level the LCD display warn us and gives a tip with the use of the code.

III.PROPOSED SYSTEM

The proposed system involves manually modifying the parameter values, and if the maximum limit is reached, it alerts us by alarm or SMS so that we may improve the performance of the hospital's medical staff and ensure that the patient receives prompt treatment to prolong their life. The majority of geographical, temporal, and even structural barriers are overcome by wireless telemedicine, also known as mobile health, which uses wireless technology advancements to deliver healthcare and exchange medical data anywhere and anytime. This allows for remote diagnosis, observation, and transfer of medical data and records.

The proposed system uses sensors, Arduino-based wireless technology, GSM technology, and sensors to monitor and record patient body parameters in real time. It also transmits medical

data, alerts caregivers, and most importantly, incorporates a system for recording data so that a complete history of health records is kept.

IV.ADVANTAGES

- It is very useful in terms of prevention.
- It is extremely useful for people with abnormalities, old age people and for people who are affected with diseases.
- Early detection of abnormality in human body reduces sufferings and reduces medical cost.
- It helps people to evaluate themselves anytime they want it.
- It saves time as we don't need to go to hospital as many times.
- It is very useful for people with medical phobia, so they can evaluate themselves in their own place.

BLOCK DIAGRAM

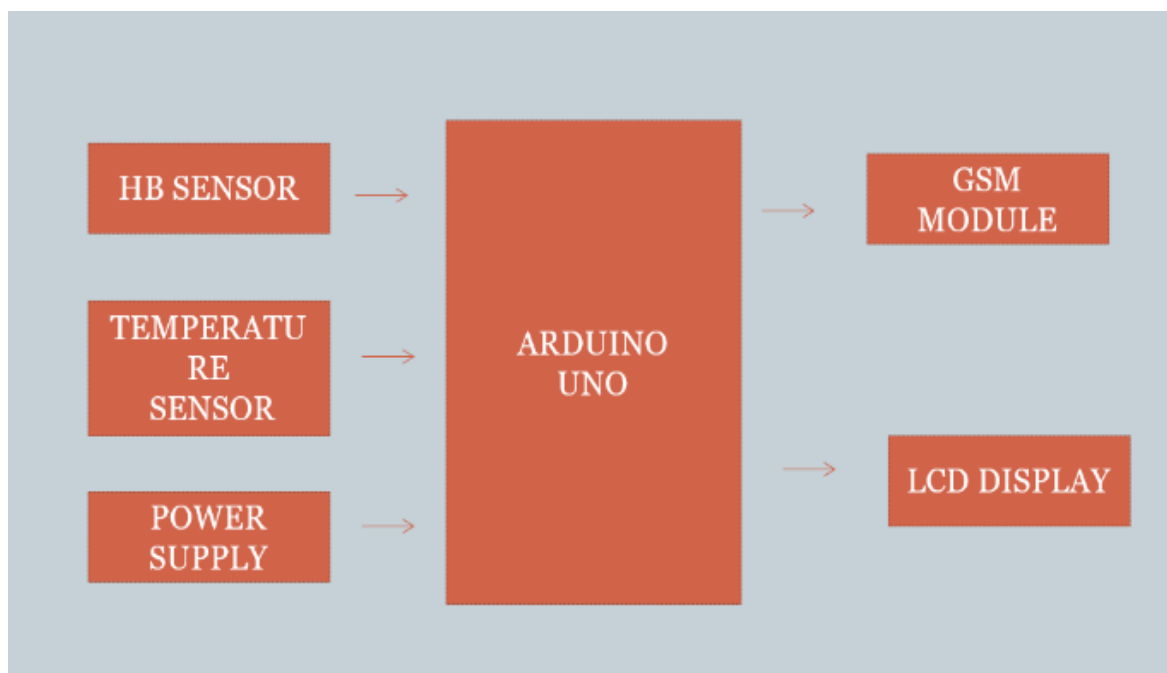


Fig 1: System Architecture

V.METHODOLOGY

The following is how the monitoring methodology for heart rate and body temperature is put into practise. Following is a list of the essential conditions: A. Hardware specifications include the following: an Arduino Uno, a Liquid Crystal Display, an LM35 temperature sensor, a pulse sensor, a GSM module, and jumper wires. B. Requirements for the software: Arduino IDE The moment the switch is switched ON, the circuit is initialised. Fingers are placed on the temperature and pulse sensors, respectively, after pressing reset. The heart rate and body temperature are then measured. Some blood veins that are very near the skin's surface, such those on the wrist, neck, upper arm, etc., allow us to feel the pulse. The heart rate is counted for

over 30 seconds before being translated to beats per minute. The thermia of body is measured concurrently. Normal condition is 39°C or 98.6°F. Usually, the portion of the body and the day have an impact on body temperature. Due to the rest that was had at night, it is lower in the morning, and it is higher in the duskbecause of muscle activity that occurred all the day. The doctor or the patient's family members receive the final measured results of thermia of body and rate of pulse through GSM modem using the AT+CMGS command. As the sensors are attached to the Arduino board's pins, the numbers from the sensors that are got are sent to Arduino. According to the code created in the Arduino, we receive a screen indicating patient's state if the data acquired from the sensors approach the critical values.

VI CIRCUIT DIAGRAM:

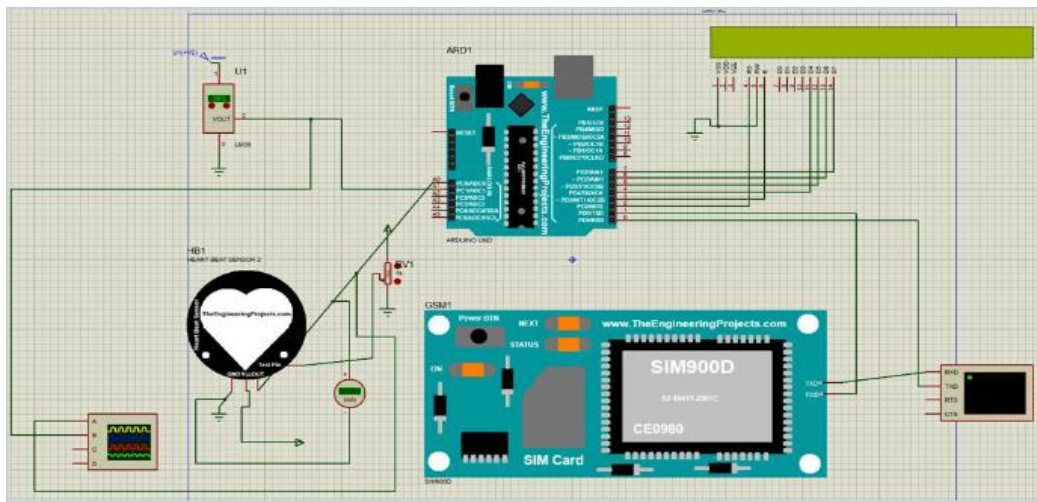


Fig 2: Circuit Diagram

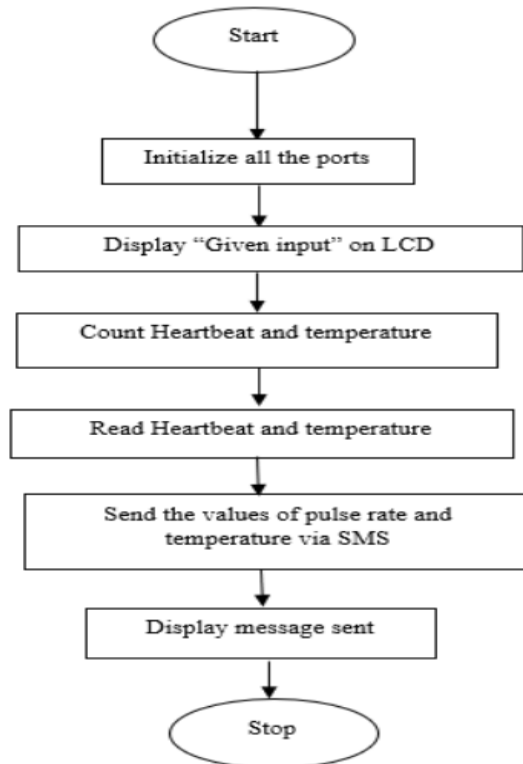


Fig 3: Flow Diagram

VI. RESULTS

Different patients' body temperatures and heart rates were tested, and the results are documented.

S. No	Body Temperature (Celsius)	Body Temperature (Fahrenheit)	Heart Rate (BPM)
1	31.75	82.98	80
2	37.5	99.5	95

On the LCD, the patient's condition is described in depth. The message will be communicated with the registered number once the temperature of body and heart beat rate have been measured, at which point an LCD message stating "SMS has been sent" will appear. When communicated, the Physician or the person's relative is alerted and can make sure the patient's health is protected.

VII. CONCLUSION

IOT, or the Internet of Things, can be used to carry out this job. We can upload this data to the Internet by doing this. An improved version of the Message based patient monitoring system is the Health Assessing System using Internet of Things created using Arduino Uno.

To signal parameters crossing the threshold value, we can install a voice alarm system module.

The name of our project is "Human Body Monitoring System." The system can calculate temperature and heartbeat by using the LM35 Sensor to monitor temperature of body and the Heart Beat sensor to assess heartbeat. It can send SMS messages to the system's saved cellphone contacts if any abnormalities are discovered.

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