REAL TIME WIRELESS WEARALE SENSORS FOR RESCUE TEAM PERSONAL HEALTH MONITORING USING IOT

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Abstract-

Nowadays all nations keep its security at high priority. Wars are being fought for land, water and acquiring the position of most powerful nation. A country's arm forces consist of three professional uniformed services: the army, the navy, and the air force. Soldiers being the backbone of any armed force usually lose their lives due to lack of medical help when in emergency, also soldiers who are involved in missions or in special operations get straggled on war fields and lose contact with the authorities. To overcome this concerns we had build this project which, using wireless body area sensor network such as temperature sensor, heartbeat sensor etc. will monitor the health status of the soldier whenever required. Also using GPS wecan track the soldier's exact location whenever required. The communication is established between the soldiers and authorities via GSM. Any abnormalities in the readings ofwireless body area sensor network is considered as a trigger for GSM to establish the connection between the soldier and base unit and send current location and health status to thereceiver. By Considering all this Parameters we implemented the basic guarding system for the soldier in low cost, light weighted, portable and precise device.

INTRODUCTION

In the world, the Indian army stands second largest force. The role played by the soldier is very important for the nation security. However, the army is suffering from lot of health issuesin the remote place due to unavailability of medical treatment at a proper time which may resultin the death/loss of the soldier. The lack of communication with the control room regarding thehealth status

and location of the soldier would lead to loss of the soldier too. This can be reducedif the real time information is available to control room as well as another soldier who are nearer to the victim soldier. The cost of the soldier life is very important. During the battle the soldier may accidentally land up in the enemy location without his knowledge, so he may need guidelines to know his current location. Other than the battle field injuries, the soldier may also suffer from extreme climate condition and fall sick, in such situation if care is taken then the life of the soldier would be saved. This can be achieved by using the IOT. The health parameter such as heart rate, ECG and body temperatures are monitored continuously and communicated with the control room automatically. When the soldier feels that he is lost, he can send an emergency message voice message alert to the control room and request for location using an android application which provides the longitude and latitude of the soldier using GPS. Now-a-days Defense Services are rapidly growing towards new innovation with advance implementation. Soldier's health is more important because they are the defenders who protect our country. In today's world enemy warfare is a important factor in the nation's security. The National security mainly depends on army (ground), navy (sea), force (air). The important and vital role is played by the army soldiers. In our project we have come up with anidea of tracking the soldier as well as to give the health status of the soldier during the war, which enables the army personnel to plan the war strategies. Also the soldier can requests for directions to the army base unit in case of emergency needs. By using the location sent by the GPS, the base station can guide the soldier to safe area.

3 II. LITERATURE REVIEW

4 Jasvinder Singh, et al., [1] proposed Global Positioning System (GPS) and Internet of Things (IoT) based soldier positioning and health signal system in 2019. Nonstop communication is possible. soldiers can communicate anywhere, which can help soldier to communicate among their other soldier whenever in need. Simple circuit and less power needed, use of low power needing peripherals and ARM processor lower the total power usage of module. Peripherals used are smaller size and also has low weight so that can be carried around safety and security for soldiers. GPS trace location of soldier anywhere on globe also health system monitors so soldiers important health parameters which gives safety and security for soldiers.

5 Niket Patil, et al.,[2] proposed a health monitoring and tracking system in 2018. This paper turn-up an IoT based health monitoring and tracking system for soldiers. This suggested module can be horseback on the soldier's body

to find their health condition and present position using GPS. These data will be sent to base station via IoT. The presented module it is possible to execute a low cost circuit to safeguard the valuable soldier life on the battle field.

6 William Walker A L, et al., [3] proposed a mobile health monitoring in 2018. The authors had discussed on different wearable, portably low weight and small size biosensors that have been developed for monitoring of the soldier health status. The BSN consists of sensors such as heart beat, temperature and gas sensors which can be put on a soldier body for health condition monitoring in real time. In this paper suggest a methodology to develop a system for real time health monitoring of soldiers, consisting of interconnected BSNs. Akshay

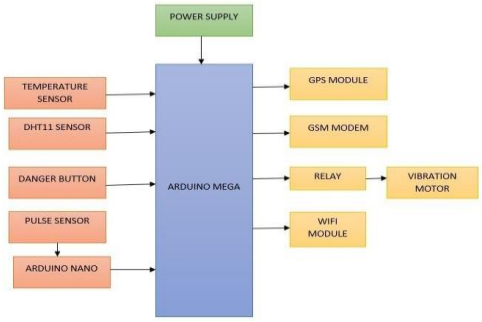
7 Gondalic, et al., [4] designed IoT Based Healthcare Monitoring System for War Soldiers using Machine Learning in 2018. This system enables to army base station to track the position and observe the medical status of soldiers using GPS, temperature sensor, heart beat sensor etc. The information from sensors and GPS values will be transmitted wirelessly using ZigBee system with the other soldiers. In addition LoRaWAN network system has been suggested to be used between the leader and base station war zones where cellular network coverage is either absent or doesnot allow data transmission The collected nformation will be uploaded on the cloud for next step data analysis and predictions using K means clustering algorithm.

8 Afef Mdhaffar, et al., [5] proposed a work on IoT Based Health Monitoring via LoRaWAN in 2017 in which collected bio sensor data is sent to analysis module through low cost, low power and secure communication using a LoRaWAN network framework. Heart beat, temperature and glucose have been measure in rural areas where cellular network coverage is either does not allow data transmission or absent. The average area covered by LoRaWAN is around 33km when the LoRaWAN gateway is put in outdoor on a 12 meter altitude power consumption of this monitoring module is claimed to be at ten times less than other long range cellular solutions, such as GPRS/3G/4G.

PROPOSED SYSTEM:

In this system we are implementing Arduino based tracking and health monitoring system. Here we are using heartbeat sensor, temperature sensor, GPS module, GSM module and a danger switch. All sensor values are set to some threshold values if any of the value increases then the buzzer will make sound and an SMS will be sent to the control room about health status of soldier. GPS module is used to track the exact location of the soldier and location will be shared via SMS.A danger button is placed if soldier is in any danger conditionhe will press.

BLOCK DIAGRAM:



Working

Health monitoring system, it measures parameters like blood pressure, heartbeat and oxygen level etc. The body parameters are measured by using sensors which involves in continuously monitoring the body parameter of soldiers.

To monitor the health condition of soldiers by taking real time information. To track the accurate location of soldiers through GPS receiver and send it to the control room by usingGSM module. Also use hazad or danger button for further safety and the abnormal messages are automatically send to the control room or higher authorities and also every condition of theperson will display on LCD which is connected to the wearable sensor.

MODULE DESCRIPTION

Pulse sensor:

A pulse sensor is a sensor that identifies pulse data. This sensor is attached to an ear cartilage or a fingertip via jumper links and communicates with an Arduino board. A pulse signal is a variation in blood level that occurs when the heart pumps the blood, and a detector detects the change in blood volume.

Fig 1: Pulse sensor

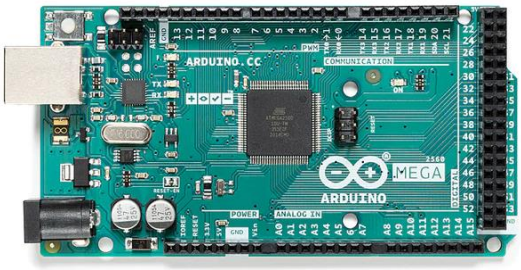
DS18B20 Temperature sensor

The DS18B20 temperature sensor is a one-wire digital temperature sensor. This means that it just requires one data line (and GND) to communicate with the Arduino.

It can be powered by an external power supply or it can derive power from the data line (called "parasite mode"), which eliminates the need for an external power supply.

Arduino Mega

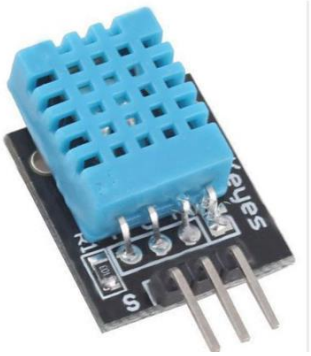
The **Arduino Mega 2560** is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins (of which 15 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.



DHT11 SENSOR:

The **DHT11** is a commonly used **Temperature and humidity sensor.** The sensor comes with a dedicated NTC to measure temperature and an 8-bit microcontroller to output the values of temperature and humidity as serial data. The sensor is also factory calibrated and hence easy to interface with other microcontrollers.

The sensor can measure temperature from 0°C to 50°C and humidity from 20% to 90% with an accuracy of ±1°C and ±1%.



RESULTS:

Fig: Hardware setup

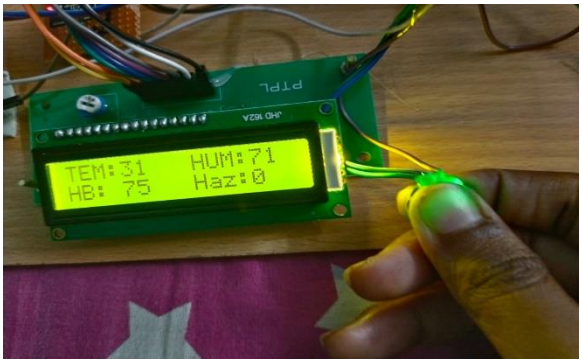


Fig :Normal health conditions of a person

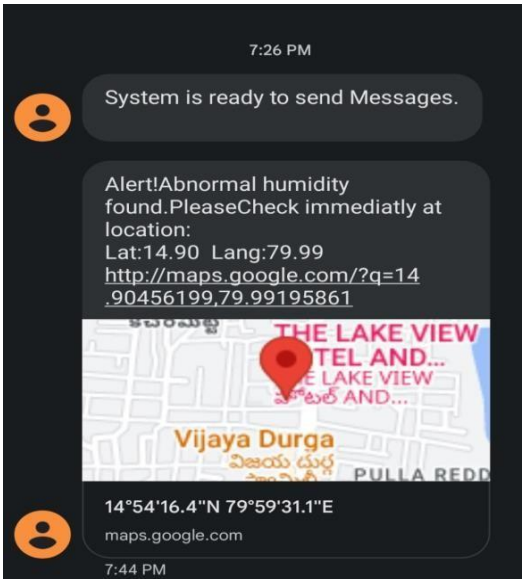


Fig: Message of Abnormal Humidity from GSM module

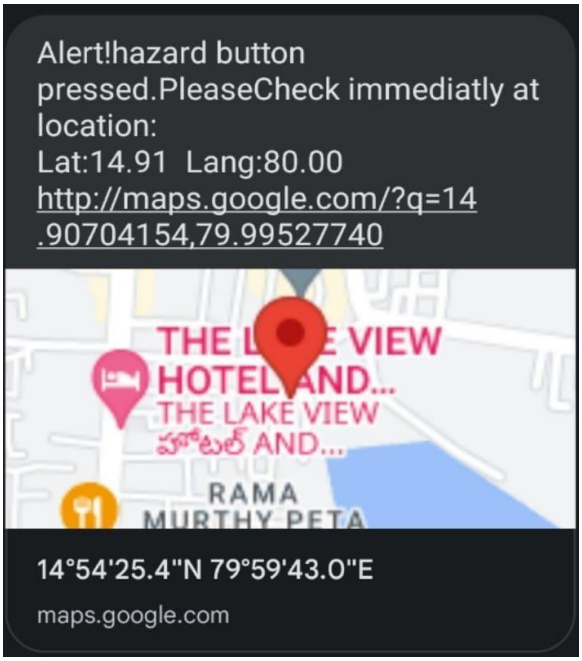


Fig :Message of hazard button from GSM Module

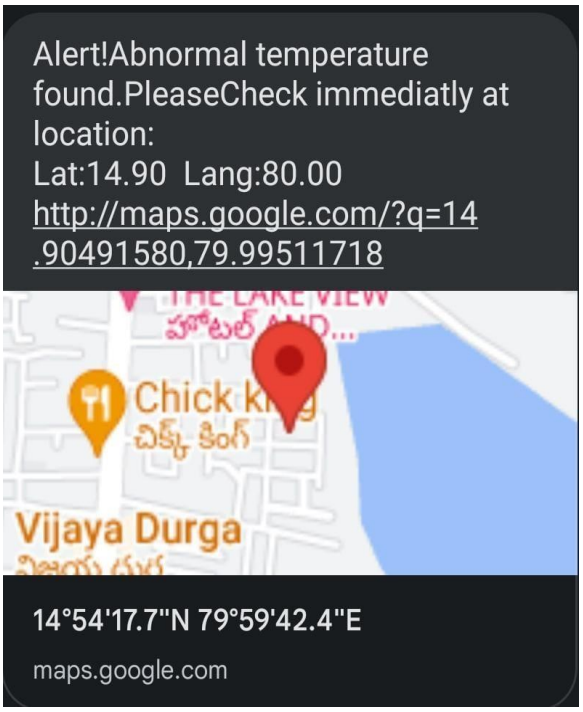


Fig: Message of Abnormal temperature from GSM module

CONCLUSION:

The subjective of this paper is to present the information about the Soldier Monitoring system is successfully implemented and executed which can be capable of collect and process the physiological parameters from the human body. In future we can include the solar harvesting system to recharge the DC power source automatically when user is exposed to sun and we can also interface the camera which will helpful to the doctors/concerned persons to view the soldier activities remotely. In the future, we can include the Solar harvesting system to recharge the DC power source automatically when the user is exposed to the sun and we can also interface the camera which will help the doctors/concerned persons to view the patient activities remotely

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