



Health Monitoring and Tracking System for Soldiers using Live track Application

Ilakiya. S¹, Sharmila. T², Ilavarasi. B³, V. Vijayalakshmi⁴
Department of Electronics and Communication Engineering
Acharya college of Engineering Technology, Puducherry, India

Abstract:

This paper reports health monitoring and tracking system for soldiers using live track application. The proposed system can be mounted on the soldier's body to track their health status and current location using GPS. These information will be transmitted to the control room through live track application. The proposed system comprise of tiny wearable physiological equipment's, sensors, transmission modules. So by using these equipment's we are trying to implement the basic life guard for soldiers in low cost and high reliability.

Keywords: Node MCU, Biomedical sensors, GPS, IoT Remote health monitoring, Tracking.

I. INTRODUCTION

In current world scenario, the security of a nation is the uttermost important factor and the security of nation depends on the army force. Without the soldier it would be nearly impossible to protect a nation. There is a necessity to develop a wearable technology which isn't bulky and dissipates very little power in the defense sector so that the location and vital health parameters of the soldiers can be tracked in real time when he is on the battlefield. Using this soldier navigation system the base station can guide the soldier to reach the desired destination. So this paper focus on tracking the location of soldier from GPS, which is useful for control room station to know the exact location of soldier. Also high speed, short range soldier to soldier wireless communication to relay information on situational awareness such as biomedical sensors GPS navigation, wireless communication.

The biosensor consist of temperature sensor and heart beat sensor. The main essence of this project is that it is an Internet of Things (IoT) based project. IoT systems are systems that consist of interrelated machines (mechanical or digital), computing devices, animals, peoples and other objects which have unique functionalities.

Using the IoT, their data can be transferred from one place to another over the network without the computer to computer and human to computer intervention. The rest of the paper is organized as follows. Section II presents background and related works. In Section III, we motivate our system methodology and a description of our proposed block diagram is provided. Conclusion is summarized in Section VI.

II. RELATED WORKS

Perturbed by the numerous instances of soldiers going untraced in action or killed in action, this paper suggests a qualitative approach to render an aid to the defense services by ensuring the

safety, whereabouts and dignity of army personnel. The proposed system enables to detect the pulse (heartbeat rate) and position of the army personnel whenever required, thus vouching that timely support is provided to the needy ones. The transmitter equipped with pulse sensor and GPS Module is programmed with certain conditions to examine the healthiness of the soldier and accordingly to communicate with the receiver at some remote location.

This paper presents framework of the design by utilizing the IEEE 802.15.4 standard and multifarious wireless sensor networks. Some of the applications of Internet of Things are smart parking, smart home, smart city, smart environment, industrial places, agriculture fields and health monitoring process. One such application is in healthcare to monitor the patient health status Internet of Things makes medical equipment's more efficient by allowing real time monitoring of patient health, in which sensor acquire data of patient's and reduces the human error. In Internet of Things patient's parameters get transmitted through medical devices via a gateway, where it is stored and analyzed. Care of critically ill patient, requires spontaneous & accurate decisions so that life-protecting & lifesaving therapy can be properly applied. Statistics reveal that every minute a human is losing his/her life across the globe. More close in India, everyday many lives are affected by heart attacks and more importantly because the patients did not get timely and proper help .

This paper is based on monitoring of remote patients, after he is discharged from hospital. Soldiers are very essential part of any nation's security system. During, wars and search operations soldiers get injured and many of them become lost. As, soldiers health is important because they are the savior of our country who protects us from enemy attacks, terrorist activities and from many suspicious activities which can harm us as well as our nation too. This paper gives an ability to track the location and monitor health of the soldiers in real time who become lost and get injured in the battlefield. It helps to minimize the time,

search and rescue operation efforts of army control unit. This system enables to army base station to track the location and monitor health of soldiers using GPS module and wireless body area sensor networks (WBASNs), such as temperature sensor, heart beat sensor, etc.

The existing system performs the task of health monitoring and does the tracking of soldiers using IoT. The control room can acquire the details about the position and orientation of soldier from GPS. Even in case of losing their direction, it is the responsibility of the GPS to guide the soldier in correct direction.

The base station can access the current status of the soldier using IOT as the different tracking parameters of the soldier get transmitted via Wi-Fi module. Based on these information, the authorities can initiate immediate action by deploying a medical, rescue team or any backup force for their help. Using various biomedical sensors, health parameters of a soldier is served along with its surrounding environment condition observed.

III. EXISTING SYSTEM

This existing system performs the task of health monitoring as well as tracking of soldiers using cloud computing. The control room can acquire the required details about the health status like (temperature, blood pressure, toxic gas, and accelerometer) along with position and orientation of soldier from GPS.

Even in case of losing their direction, it is the responsibility of the GPS to guide the soldier in correct direction which would be guided by the control room. The control room can access the current status of the soldier using cloud computing the different tracking parameters of the soldier get transmitted via GSM module in our system we have designed in such a manner that the threshold value is set to individual sensor so that the control room can get the required information of the soldiers during the emergency condition.

This information will be stored on the Cloud and can be extracted on the PC of control room, as and when required. Based on this information, the authorities can take immediate action by deploying a medical, rescue team or any backup force for their help. Using various biomedical sensors, health parameters of a soldier is observed.

The proposed system is consist of two main functions as acquiring the data from the hardware and transfer of the data through cloud computing. LM35 temperature sensor, toxic gas detector sensor, blood pressure, accelerometer oxygen level and GSM for continuously monitoring health status of soldier's is used for transferring of all the data from the above sensors. GPS is used to determine real time position and orientation. Data from sensors and GPS receiver is processed and collected using Arduino (ATmega328P) processor.

The specific choice of processor is due to the facts that, as compared to the other data possessors used in existing system. Arduino board is easily available and user friendly in terms of its commends and also with flexible interfacing capability ATmega328P better than other processors.

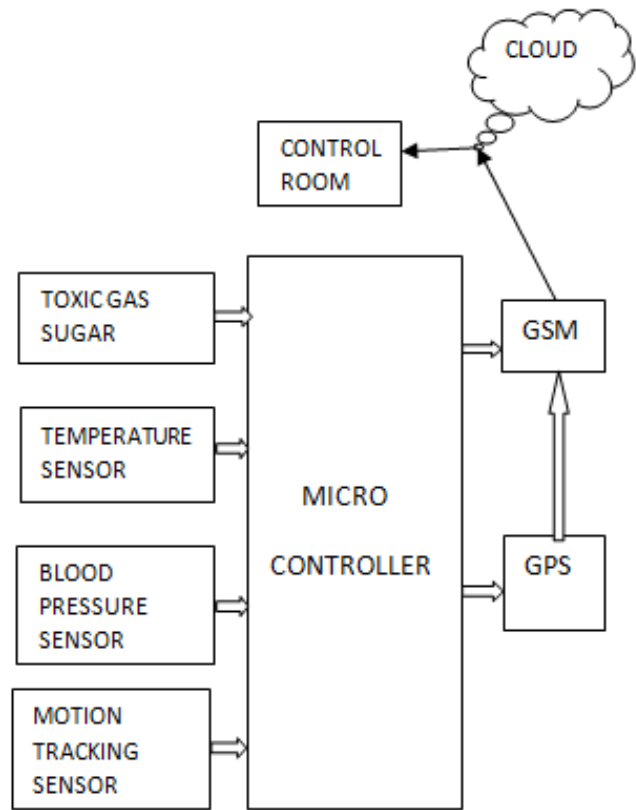


Figure.1. Block Diagram of Existing Work

The actual system is deployed along with the soldier's kit. The ATmega328P processor will act as the brain of the unit. Soldier unit consist of LM35 Temperature Sensor, TOXIC - Gas Sensor (CO), Accelerometer Sensor, Blood Pressure sensor, GSM, GPS Transmitter, Arduino, Led Interface, and Buzzer. The threshold values of the desired parameter is set and pre-programmed using the Arduino as per the threshold value and the person under test. In the proposed experiment we have considered body temperature for the verification purpose. Whenever the temperature is deviated from the set threshold value, system gets Alert and sends the data to the control room with a buzzer beep.

IV. PROPOSED WORK

In this proposed system performs the health monitoring and tracking of soldiers using live track application. The proposed system is deployed along with the soldier's kit. The ATmega328P processor will act as the brain of the unit. Soldier unit consist of Temperature Sensor, heart rate sensor, GPS Receiver, Atmega 328, Nodemcu. The threshold values of the desired parameter is set and preprogrammed in the atmega328 as per the surrounding environment and the person under test. Temperature sensor, heart Rate sensor continuously monitoring health status of soldier. GPS is used to determine real time position and orientation. Data originating from sensors and GPS receiver is processed and collected using Arduino (ATmega 328P) processor and it will display the status of the soldiers and his location using live track application. In this proposed experiment we have considered body temperature for the verification purpose. Whenever the temperature is deviated from the set threshold value, system gets alert and sends the data.

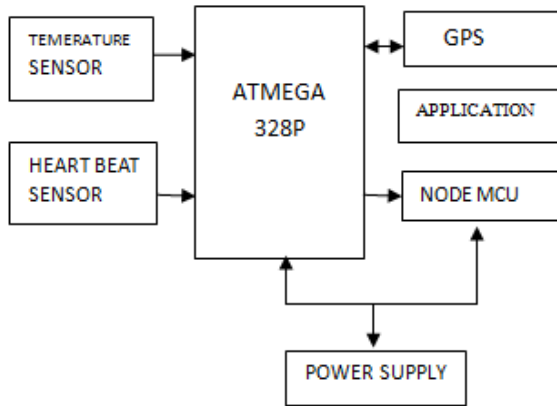


Figure.2. Block Diagram of Proposed Work

A.HEART BEAT SENSORS

This sensor is designed to measure heart beat when finger is placed on it. The digital output of this sensor will be interfaced to controller and it will directly measure heartbeats in beats per minute (BPM) rate. It works on the principle of light modulation by blood flow through finger at each pulse. Hence, the measurement threshold is set for 60 to 100 bpm. Whenever heartbeat of soldier will deviate from the threshold value, the system will transmit information to live track application.

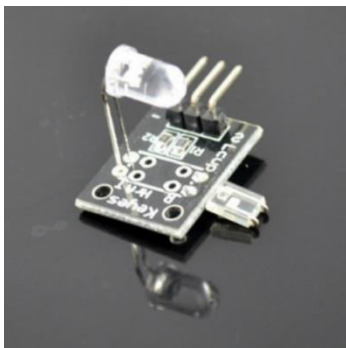


Figure.3.heartbeat sensor

B. TEMPERATURE SENSOR

Temperature sensor which is widely used to measure body temperature. This device is rated to operate over a particular Temperature range. Hence, a threshold value in the range of 30 to 40 C is considered.



Figure.4. temperature sensor

C. GPS RECEIVER

The GPS unit is installed in addressing system so that base camp can track their movements and real time information in all weather, at all times from anywhere on globe.



Figure.3.GPS Module SIM28M

D. Node MCU

The Node MCU ESP Wi-Fi 8266 module provides minimum of 512Kb flash memory. It is low cost user friendly plug and play module with easy to configure and set up. It is widely used to develop hardware platform in LIVE TRACK application. This device is also called as mini Arduino. Every module has unique IP address which is special identification of every Soldier. Every soldier is connected with control room with the help of ESP8266 module IP address.

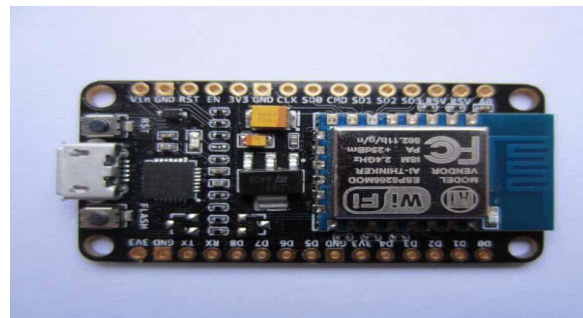


Figure.4. Nodemcuesp8266 Wi-Fi Module

V. RESULT AND DISCUSSION

Healthcare field is one of most delicate and important fields to be developed and enhanced by Smart systems designed to present sustainable medical interventions at manner time where the smart system should be simple, low energy consumption and real time feedback here we implement such health care in soldier which can helps in the analysis of the soldier including patients name, temperature rate, heartbeat rate Soldier health monitoring and location tracking is an effective security and safety system which is made by integrating the advancements in wireless technology.

Table for Qualitative Analysis of the Proposed System

contribution	Communication Techniques	Data Processor
P.Kumar et. al.	GPS, GSM.	AT89C51
H. Kedar et. al.	RF Transmitter & Receiver, GPS	ARM Process
Kumar and Repal	ZigBee, GPS.	ARM 7
R.Kumar et. al.	IoT	Raspberry pi
Proposed System	GPS,IoT	Arduino (AT mega 328P)

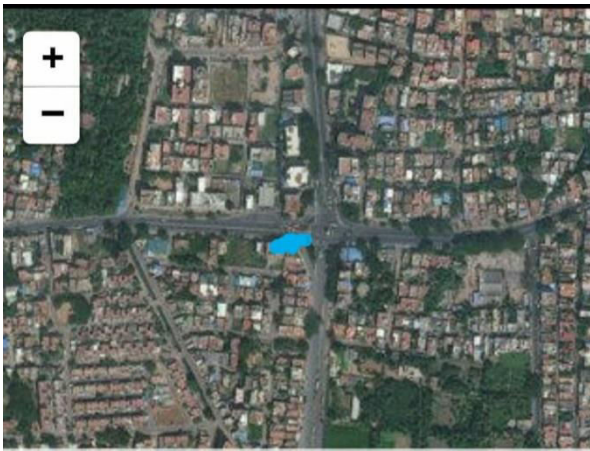


Figure.5. GPS tracking output

VI. CONCLUSION

The paper reports health monitoring and tracking of the soldiers. Atmega board is used which is a low cost solution for the possessing purpose. Biomedical sensors provides heartbeat, body temperature, and current location of the every soldier using GPS. This technology can be helpful to provide the accurate location of missing soldier in critical condition and overcome the drawback of soldiers missing in action. The addressing system is also helpful to improve the communication between soldier to soldier in emergency situation and provide proper navigation to control room. Thus we can conclude that this system will act as a lifeguard to the army personnel of all over the globe. In future, a portable handheld sensor device with more sensing options may be developed to aid the soldiers.

VII. REFERENCES

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