Soldier Health and Position Tracking System

Dilip K[1], Mahesh P B[2], Paramesh R D[3], Sagar G[4], Ravikumar H[5]
1,2,3,4U G Student, 5Asst Professor
Dept of ECE, MIT, Mysore, Karnataka, India.

Abstract - In present era, the threat of enemies plays an important role in security policies of any state. In this prospective, the military soldiers plays an important and vital role. There are several considerations concerning the security of those troopers. So for the security purpose of troopers, a number of equipment or devices are attached with them to take the look on their health status and their ammunitions. Health relating sensors like pulse rate sensor, body temperature measuring sensor, transmission and processing capabilities, can thus help to make low-cost wearable solutions for health monitoring. Proximity sensor can be used for the detection metal. GPS used for basically point the latitude and longitude to find exact location of soldier. RF module can be used for effective range of high-speed transmission that will be required to relay information on situational awareness, tactical instructions, and covert surveillance related data during special operations reconnaissance and other missions. So by using these equipment's we are trying to implement the basic life guarding system for soldier in low cost and high reliability.

Keywords - Pulse rate sensor, Temperature sensor, Proximity sensor, GPS, RF module

I. INTRODUCTION

As we know, enemy warfare has an important impact regarding to security issue of any state. The national security in the main relies on army (ground), navy (sea), air-force (air). The vital and important role is done by the military soldier's. There are several considerations concerning the security of those troopers. The soldiers of future guarantees to be more advance technologically in every crucial situation like warfare or any secret mission. In entire world, numerous analysis platforms presently being arranged, like the United States' Future Force warrior (FFW) and also the United Kingdom's Future infantry Soldier Technology (FIST) and they have a plan of making totally modern fight methodology.

Helmet attached screens, accomplished of presenting maps and video from alternative group associates, varieties of physiological sensor's to observance health parameters. These devices have capability to improve wakefulness according to situation, not just for the soldier in battle field, however additionally for all the military personnel at base station and they can interchange data via wireless communication. But the main concern was that to create a light weight system, which can get desired results. One in all, the basic challenge in military operations is that the troopers are not in the position to interconnect with base station. Additionally, the accurate navigation between the soldiers plays precious role for careful forecasting. The

defense department of a country must be effective for the security of that country, as well as soldiers also must be effective. For this we are introducing a "Soldier health and position tracking system". This system will be use full for soldiers, who involve in special operations or mission.

II. LITERATURE SURVEY

The section describes about the work done on the car controlling using different technologies which were designed by other researchers.

Niket Patil et.al.,[1], In this paper, they have proposed a real time tracking mechanism and the proposed system is based on the IOT concept. This system will be helpful in the real time continuous monitoring of soldier's health parameters and location. They have used wi-fi module for communication purpose, the military base station can access the current status of the soldier using IOT and the information will be stored on the cloud and can be extracted on the PC of control room. Pulse rate, body temperature and oxygen level in an environment can be monitored along with location tracking of the soldiers using GPS can be monitored using the proposed system. The transmission of these parameters to the control room is carried out by IOT, the control room receives the position and orientation of soldier from GPS. Further, soldiers can be guided fort the correct directions during the operations using 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. These information will be stored on the Cloud and can be extracted on the PC of control room, as and when extracted. Based on these information, the authorities can initiate immediate 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 (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 a low cost and easily available with flexible interfacing capability. so ATmega328P better than other processors.

Hanifa Zaki et.al.,[2] In this paper, they have proposed a system which performs the task of health monitoring as well as tracking of soldiers using cloud computing. The proposed system consists of two main functions that is data is acquired from the hardware and data is transferred through cloud computing. They have used GSM module for communication purpose, different tracking parameters of the soldiers get transmitted via GSM module. They have

designed a system in such a that the threshold valve is set to individual sensor so that the control room can get the required information of the soldier during the emergency condition. 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.

The actual system is deployed along with the soldier's kit. TheATmega328P processor will act as the brain of the unit. Soldier unit consist of LM35Temperature Sensor, TOXIC - Gas Sensor(CO), Accelerometer Sensor, Blood Pressure sensor, GSM, GPS Transmitter, Arduino, Led Interface, Buzzer. The threshold values of the desired parameter is set and program 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. 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 The sent SMS including Patients name, heart rate, body temperature, longitude and latitude of the position are exhibit. Soldier health monitoring and location tracking is an effective security and safety system which is made by integrating the advancements in wireless and embedded technology.

Shweta shelar, et.al.,[3] The goal of this project is to develop a low cost, low power, reliable, non-intrusive and non-invasive signs of health status. To track the location of the soldier i.e. longitudes and latitudes. The methodology adopted for this project is to use non-invasive sensors to measure heart rate and body temperature. Signal conditioning circuits are designed to filter and amplify signals to provide desired output. All the components used in the circuit are low powered and cheap. The acquired data is real time and is sent through ADC and into Micro controller. The systems consist of an infrared (IR) LED, a photo transistor sensor, both high and low-pass filters, as well as an amplifier, comparator and output LED. An oscilloscope is included to display the signal. Initially, the IR-LED is used to illuminate a person finger with infrared light. The light intensity is modulated by blood pressure changes within the finger before striking the photo transistor. The sensor then converts the changing light intensity into a proportional voltage containing two components a large DC off-set corresponding to the average light intensity as well as a small varying signal caused by changing blood pressure.

The voltage signal is then passed through a high pass filter to remove the DC component and then light is amplified. Low-pass filtering is then applied to remove any high frequency noise before displaying the signal on an oscilloscope. Finally, the signal is compared to a reference voltage using a voltage comparator, and an output LED is illuminated if the voltage signal is greater than the desired threshold, indicating a heartbeat. The rectangular pulses which we get from this procedure are applied to the counter pin of the micro controller. Counter of the Micro controller counts the number of pulses for duration 5 sec. multiplies it by 12 and displays as a heartbeat rate per minute because in order to obtain the results in bpm (beats per minute).

Govindraj A, et.al.,[4] This paper has an idea of tracking the soldier and navigation between soldier to soldier health status along with knowing their speed, distance, height as well as environmental situation of them during the war, which enable army personnel to plan the strategies of war. The control room gets location of soldier from GPS. Even in case of losing the battlefield it is the responsibility of the GPS to guide the soldier on correct path if he lost in the battlefield. The base station can access the control status of the soldier which is displayed on the PC. And hence can take immediate action by sending help for the soldier or sending backup for threat ahead. Using various biomedical sensor health parameters of soldier's are observed. The position and orientation of soldier is trapped using GPS. 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 and accordingly they will guide them. Also High-speed, short-range, soldier-to-soldier wireless communication to relay information on situational awareness, such as biomedical sensors, GPS navigation, wireless communication.

Dinesh kumar Jaiswar, et.al.,[5] In this paper they have completed an initial design of individual sensor nodes and developed a basic prototype of the system to collect the sensed data. This paper also gives idea to track soldier at any moment. Additionally, the soldier will be able to communicate with control room using GPS coordinate information in their distress. It is able to send sensed and processed parameters of soldier in real time. In this paper, it is possible to transmit the data which is sensed from remote soldier to the base station's PC using wireless transmission device like GSM. The accuracy of the system may be affected by some factors such as weather, environmental conditions around the soldier's unit and GPS receiver. This paper had presented an idea for the safety of soldiers. There are many instruments which can be used to view the health status of soldiers as well as ammunitions on them. The Biosensor which consists of various types of small physiological sensors, transmission modules have great processing capabilities and can facilitates the low-cost wearable solutions for health monitoring.

III.   PROPOSED METHODOLOGY

1. Transmitter block diagram:
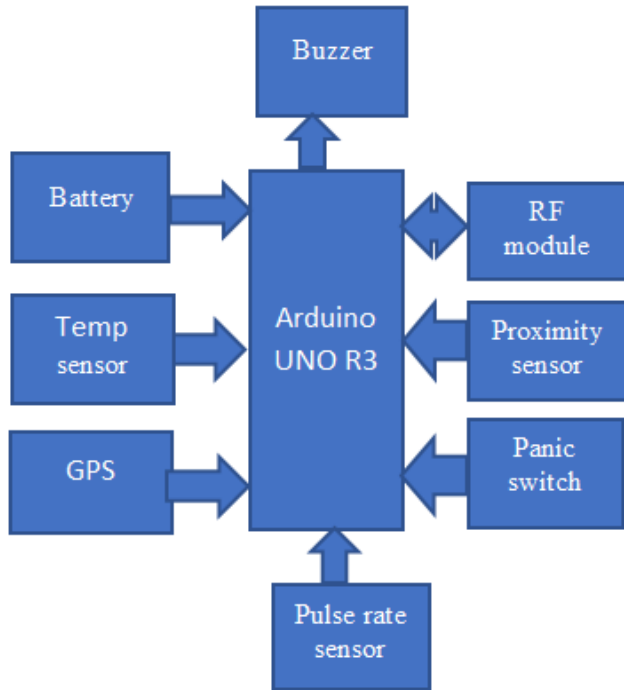
2. Receiver block diagram:
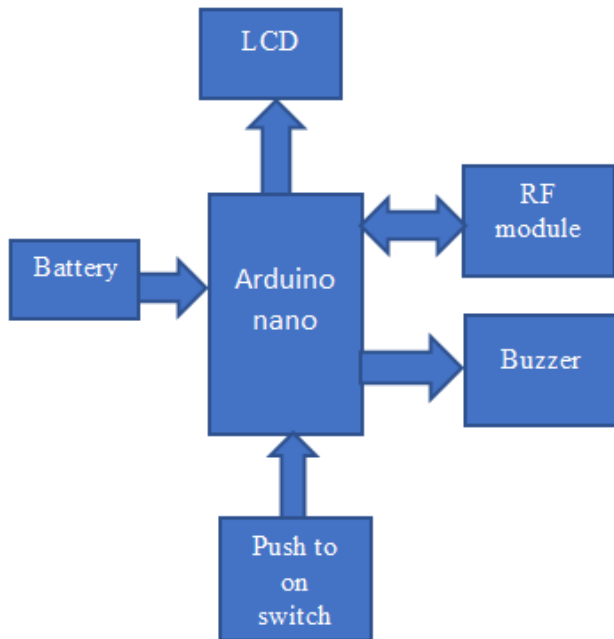
The proposed system performs the task of health monitoring as well as tracking of soldiers using cloud computing. The control room can acquire the required details about the health status like (temperature, blood pressure,) and metal detection along with position and orientation of soldier from GPS. 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 RF module in our system we have designed in such a manner that the threshold valve is set to individual sensor so that the control room can get the required information of the soldiers during the emergency condition. These information will be stored on the Cloud and can be extracted on the PC of control room, as and when required. Based on these 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 consists of two main functions as acquiring the data from the hardware and transfer of the data through cloud computing. temperature sensor, blood pressure, proximity sensor and RF for continuously monitoring health status of soldier. RF 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.

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 Temperature Sensor, proximity Sensor, Blood Pressure sensor, RF, GPS Transmitter, Arduino, LCD Interface, 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.   RESULT

Figure 1: soldier health parameter display

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 The sent SMS including, heart rate, body temperature, longitude and latitude of the position are exhibit. Soldier health monitoring and location tracking is an effective security and safety system which is made by

integrating the advancements in wireless and embedded technology.

V. CONCLUSION

The task entitled "SOLDIER HEALTH AND POSITION TRACKING SYSTEM" is a compelling security and wellbeing framework which is made by coordinating the headways in remote and implanted innovation. It helps for a fruitful mystery mission. This framework can be utilized as a part of basic conditions. It has continuous capacity. The exactness of framework is influenced by a few factors, for example, climate, condition around the portable warrior unit, GPS recipient. The future works incorporate streamlining the equipment framework, picking an appropriate GPS beneficiary.

VI. REFERENCE

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