



## AUTOMATIC SOLDIER TRACKING AND HEALTH MONITORING SYSTEM

N. Sahithi<sup>1</sup>, A. Abhishek<sup>2</sup>, G. Sai Saketh<sup>3</sup>, P. Lauren Sherly<sup>4</sup>, Dr. G. Chenchu Krishnaiah<sup>5</sup>

Student<sup>1,2,3,4</sup>, Professor<sup>5</sup>

Electronics and Communication Engineering

Audisankara College of Engineering and Technology, Gudur, AP, India.

### ABSTRACT:

Nowadays, the nation's security system is based on the soldier's safety is seen as critical. In terms of troop safety, there are a variety of methods in terms of co-ordinates. With the help of that the directions can be identify easily. This project method can be fixed on the body of the soldiers to monitor their current health status, if they are facing any health issues. This project method uses global positioning system to monitor their current location of the soldier. The message will be reached to the base station through GSM modem. Implementation of this method using sensors and GSM modem gives a wireless system for monitoring the current location, the heart beat and body temperature of the soldiers. The heart beat rate of the soldier will be displayed in the LCD display. If temperature condition is abnormal means send alert to control room through GSM module. In addition to this if any emergency situation means touch the emergency button by the soldier and send location information to the control room.

**Keywords:** Soldier safety, GSM Modem, Heartbeat data, Temperature condition, Emergency situation

### INTRODUCTION

The third largest standing army in the world with 1,200,255 active troops and 990,960 reserve troops is the Indian Armed Forces. The lack of communication between the soldier and the base station may increase the injuries /death rate. It can be minimized only if the current information is passed to the control room, if the soldier is facing any health issues. The soldiers are facing many health issues nowadays. The inability to maintain continuous communication with the base station during operations, the lack of prompt medical assistance, and operations in various geographical conditions are just a few of the major safety concerns. The Cable-based systems, radio frequency transceivers, walkie-talkies, ZigBee, and global system for mobile communication based tracking systems were the widely utilized methodology for tracking soldier's lives on the battlefield.

All of these systems, however, suffered from one or more issues, such as high installation costs, signal loss, and high noise, as well as their bulky nature. As a result, a moveable, wireless, low-cost tracking device with excellent dependability is urgently needed to preserve soldiers' lives on the battlefield. This project proposes a portable real-time tracking system in response to these issues. The project method will be helpful in the real-time continuous monitoring of soldier's health and location of the soldier. The project method can track the soldier's heart rate and body temperature in a given setting, as well as their location monitoring using GPS system. The control room receives these parameters with the help of the GSM system. The position of the soldier is transmitted to the control room through GPS. Further, GPS can also be used to lead soldiers in the right path during operations.

### 1.1 OBJECTIVE

The main objective of this project to allow military to track the current GPS position of the soldier and also check their health status including heartbeat and body temperature if they are facing any health issues. The GPS modem send the current position of the soldier with the link pattern to the base station can easily track the soldier's position. With the help of this system we can easily get the health status of the soldiers and providing them to get the instant help.

## 1.2 EXISTING SYSTEM

All parameters in real time are recorded by the wireless body area sensor and it is the current existing one we use. Humidity sensor, temperature sensor and pulse sensor are the different types of sensors we are used here to detect the health status of the soldier. The most important thing in this project is that it is a wearable technology. In this system there is not available any tracking system it only monitors health parameters and displayed the values and buzzer alert is activated when abnormal condition.

## 2. LITERATURE SURVEY

By using heartbeat sensor using fingertip through node MCU board we can able to detect the heartbeat of the person if they are facing any health issues. [1]

Sleep disordered breathing issues for long term is a major problem for everyone facing nowadays and by using iota enabled polymer sensor embedded fabrics we will find a solution for that issue. [2]

The implemented garments and devices are used to ensure the proper functioning of series of 12 full sets have been tested functionally and recording done using The cardiogenic bio potential, temperature values and the skin response. The results we have got after the experiment shows that the wearable measurement system we implemented operates according to the values and specifications used for metal stress experiments it will be used for the dozens of health volunteers in the upcoming project phases. [3]

The region by-region analysis of the military and economic development in military balance in 2014 shows the affecting defense and security policies including the weapon trade and equipment in military. [4]

The major training activities of the UN and non-UN deployments and international comparisons of defense expenditure and military personnel are shown in detail in the comprehensive tables. These number can be reduced only if the health status and location of the soldier is available at the base station. The soldiers are facing many problems while they are in remote areas. Lack of communication inability to find their current location and lack of medical attention these are the major problems regarding the safety issues of the soldier. [5]

Majorly caused heart issues and varying in body temperatures in soldiers are monitored by gps tracking systems and send details to the base station. [6]

The third largest standing army in the world with 1,200,255 active troops and 990,960 reservet troops is the Indian Armed Forces. Due to the lack of communication problem the army suffers a lot while the soldier is facing any injuries or any other health issues this may increase the death rate of the soldier. It had been found that the death rate of the soldiers died due to health issues are more when compared to soldiers died in the battlefield. [7]

The soldiers are facing many issues regarding their health status. The major training activities of the UN and non-UN deployments and international comparisons of defense expenditure and military personnel are shown in detail in the comprehensive tables. These number can be reduced only if the health status and location of the soldier is available at the base station. [8]

The region by-region analysis of the military and economic development in military balance in 2014 shows the affecting defense and security policies including the weapon trade and equipment in military. By displaying the key equipment inventories and economics in defense it shows the detailed entry description of 171 military capabilities. The major training activities of the UN and non-UN deployments and international comparisons of defense expenditure and military personnel are shown in detail in the comprehensive tables. [9]

The security policies of many states are mainly disturbed by the threats of enemies in recent days. So that the soldiers in the military plays a major important and vital role. The security of those soldiers is concerned by several considerations. There are many numbers of equipment and devices attached to them to monitor their health status. [10]

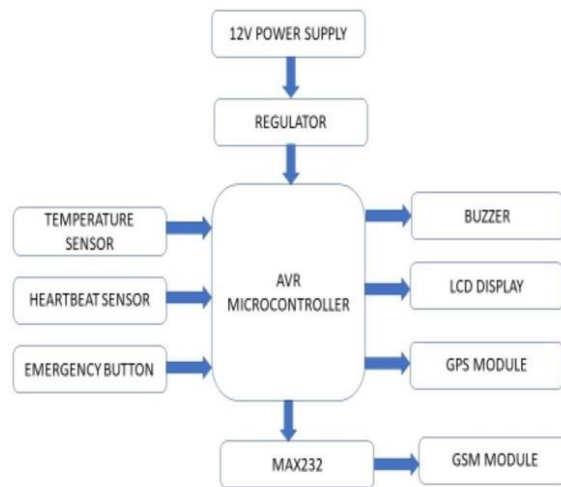
The security of the nation mainly depends upon the defense department of the country. While the soldiers are in any mission this system will be useful for them in many ways. By this system we can find the position of the soldier using Global Positioning System. It can be possible with the help of M-health. The mobile computing, medical sensors and communication technologies for health Care are known as M-Health. [11]

Wireless technology using ZigBee helps to monitor the patient health status and send an information immediately to the doctor if they are facing any issues so that the doctor can provide them an instant help. [12]

For the real time health monitoring system, we use the Body Sensor Network which can be placed near or within a body and it consists of many physiological and biomedical nodes. In this paper, we mainly discuss about the interconnected BSNs which act as a system and it also plays a major role in the real time health monitoring of the soldiers. [13]

### 3. IMPLEMENTATION

#### 3.1 FLOW DIAGRAM

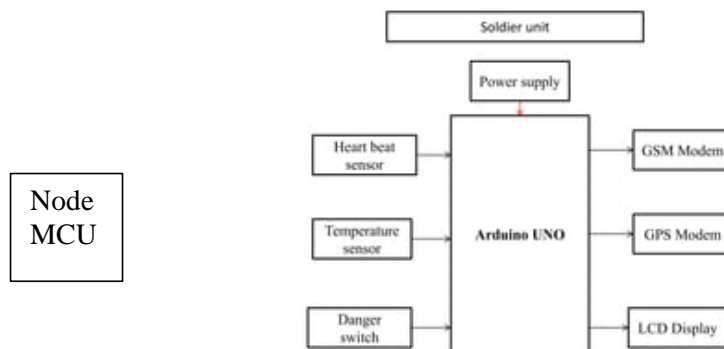


**Fig. 1** Proposed System Flow diagram

This project provides a GSM and GPS based health detection and location tracking of the soldier in an emergency situation by using the hardware consisting of the sensor with GSM module for communication purpose.

The sensor components are mounted on the soldier which reads the body parameters of the soldier such as heart rate, and body temperature. The sensor used here for checking the heart beat of the soldier and displayed the values in LCD display. The body temperature will be monitored by using temperature sensor and reports to the control room and guardian/other soldier automatically using GSM communication when it is not normal. This application is used by the soldier in the emergency to request for the help from the control room by touching the emergency button and it is used by the control room to track the current location of the soldier by using GPS module to take necessary action.

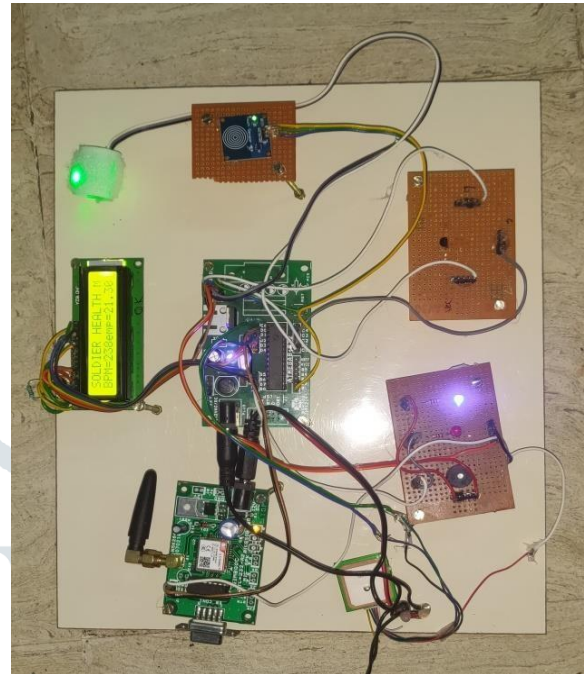
#### Block diagram:



**Fig. 2** Proposed System Block diagram

The circuit diagram consists the components of AVR controller, regulator, temperature sensor, power source, heart beat sensor, emergency button, GSM module, buzzer and LCD display. The regulator is connected with 12V power supply for voltage regulating 12v to 5v then 5v supply is given to AVR controller device. The regulator is connected with VCC and GND pins. Temperature sensor is connected to controller device. It has three pins. Positive and negative pins are connected to VCC and GND another pin are connected to controller device. The controller device is connected with the heartbeat sensor. The positive terminal is connected to VCC and the negative terminal is connected to GND. Output pin connected to controller device. LCD display data pins connected to controller digital pins d2, d3, d4, d5, d7 respectively connected to positive and GND connected to negative pin. Emergency button is connected to controller device digital pin. GSM module device connected to controller TX and RX pins. GPS module is connected to controller TX and RX pin.

## 4. RESULT



**Fig. 3** Embedded setup of the proposed system

If the body temperature of the soldier reaches more than 38 degrees Celsius means the temperature sensor senses, it and it will send an alert to the base station. If the soldier will press the emergency alert button after that temperature rise means the concerned soldier latitude and longitude details will send to the base station automatically and then they will get the help from the base station. If the heartbeat rate of the soldier rises maximum than the normal rate means the heartbeat sensor used here will automatically sense and shows an alert. If the soldier having sudden rise in temperature means an alert will send to the base station in the form message. This message also contains the soldier id and then their latitude and longitude.

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## 5. CONCLUSIONS

There is always a lack of communication between the soldiers and the base station. In the way, we overcome the problem with help of our project the soldier's health status is monitored by the control room and if soldier is in need of help he can easily send the signal of his current location to the base station. The system we used here will act as a lifeguard for all the soldier's while they are facing any problem or health issues.

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