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Soldiers Border Alert System with Fall Detection Monitoring

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Abstract: ***It is concerning the safety of the soldiers, It reports an Internet of Thing(IOT) based Soldiers Border Alert System With Fall Detection Monitoring. This Proposed method is when the soldiers crossing the border and the soldiers health will critical an it would alert to control room. The GPS tracking of soldier's current location. The informations are Transmitted to the control room through Email/SMS. The proposed method of tiny wearable physiological equipments, sensors, and transmission modules. Designing of this system using GPS is wireless system for tracking the soldiers location and the GYROSCOPE sensor is measuring the soldiers body angle. So the soldier fall down it would measuring the angle and read the soldiers health status. The Proposed System uses RSSI module for signal strength for data receiving from the soldier.***
Keywords: GPS, RSSI module, Gyroscope sensor, Temperature Sensor, Pulse sensor.

I. INTRODUCTION

The important role to soldiers are give of security for our country The soldiers are sacrifice their life for their country. Soldiers entered the enemy lines often lose their lives due to lack of connectivity. So, the army base station known the soldier's location and their health status. This project must be really concerned about the soldier's safety, it will check on the health status of the soldier and his location. Soldier's exact location will tracking is using GPS, it is wireless system.

The health parameters of soldiers are using bio sensors such as temperature sensor, pulse sensor, gyroscope sensor. The Internet Of Thing (IOT) is used for soldiers information data can be read and stored and it sending the information to the control room through the Email/SMS.

Soldiers when different situations following conditions:

A. Soldiers when fall down.
B. In critical health status.
C. When soldiers crossing the border to track the location of the soldier.

II. LITERATURE REVIEW

Soldiers can communicate anywhere, which can help soldier to communicate among their other soldier whenever in need. Simple circuit and low power needed, use of less power needing peripherals and ARM processor lower the total power usage of module. Peripherals used are smaller size and also has less weight so that can be carried around safety and security for soldiers. GPS trace the location of soldier and also health monitors so soldiers very important health parameters which gives safety and security for soldiers. The soldiers will be able to communicate with control unit using GPS coordinate information in their pain. It is able to send the parameters of soldier in real time. It enables to army control unit to monitor the send the sensed and processed health parameters of soldiers like heartbeat range, body temperature, etc using body sensor networks. The parameters of soldier's are wirelessly transmitted using GSM. One of the important parts is played by the army soldiers. Many steps taken in concerning the protection of soldiers. So for their safety intend, several instruments are on horseback them to find their medical condition. Bioprobes system contain types of biosensors, transmission system and processing capabilities, and can thus easy low-cost wearable not obtrusive solutions for health monitoring. These instruments are being added to weapons and clothes, and some militaries such as the Israeli Army which are exploring the option of embedding GPS devices into soldier's clothes and uniforms, therefore that base station is able to monitor their soldier's in real time. In this paper, the aim is bio probes of military soldier's using amplified RSSI signals to increase the signal range of GPS and to maximize the data transferring efficiency. To enhance health monitoring system by using gyroscope sensor so that we can received information with more accuracy and stability detailed survey. It must be important to the known as soldier's health status and when he crossing the Border it will alert to soldier. Were soldiers are fighting for our country so we have planned to soldiers safety and security it must be really safety for soldiers.

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III. EXISTING SYSTEM

The important part on the health monitoring system of the soldiers. [3]The block diagram was soldiers position tracking and health monitoring system it using IOT includes different types of sensors that are heart beat, temperature and gas sensors, power supply and GPS as input Arduino UNO as preparing device.

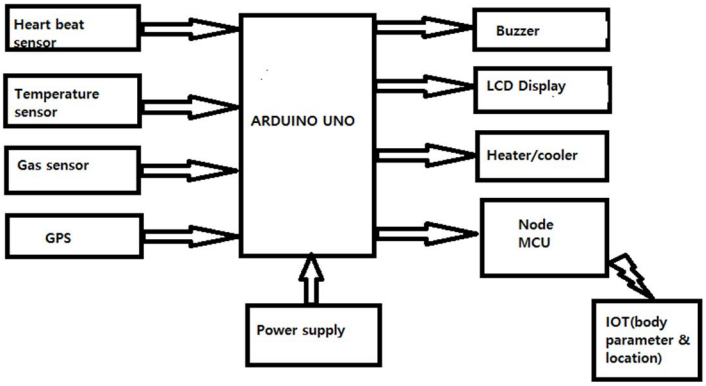

Fig. 1 Block diagram of Existing System

RF transceiver gets the longitude and latitude of soldier's unit and calculate their distance, speed and height between them. It also sends the data information of soldier's health status to the army base station containing the health parameter and the location of soldier. At army base station was soldier's information gets through the GPS receiver, the soldiers health status and his exact location are shown the display on the system at base station using software. [4]Arduino UNO is an open sources micro controller board based on the microchip AT mega 328P micro controller and developed by Arduino. Arduino UNO checks the level of heart rate, temperature and gas. If the heart rate is greater than or lesser than its threshold value, Arduino turns ON the buzzer, if the temperature varies from threshold value, it will turn ON the heater/cooler. The position information, heart rate, temperature and gas noticing is sent to the Node MCU through serial communication. When Wi-Fi is available, it receives and read the serial data from Arduino and uploads data in IoT and compares the data, if there is any difference in threshold values, it will send SMS/Email to the army base station.

A. Draw Backs

Soldiers are not easily track able. They will not get help during crossing the border. The signal strength is low.

IV. PROPOSED SYSTEM

The proposed system to design [7][9][10]IOT based Soldiers Border Alert System With Fall Detection Monitoring. It must be important to the known as soldiers health status and when he crossing the Border it will alert to soldier. Were soldiers are fighting for our country so we have planned to soldiers safety and security it must be really safety for soldiers. The health parameters of using bio sensors Temperature Sensor, Pulse Sensor, Gyroscope Sensor, Alarm Sensor. The soldiers exact location to be tracking using the GPS. It is an wireless communication.

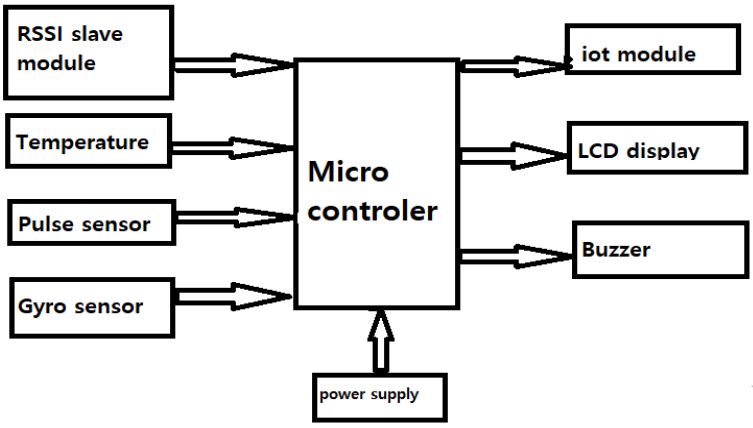

Fig. 2 Block Diagram of soldier unit

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The micro controller of using Arduino UNO. It would receiving all data and stored in micro controller. When soldiers crossing the Border this system would intimate the control room automatically. The soldiers travel in particular distance. The control room would warning to soldiers then the soldiers will be tracking a control room.

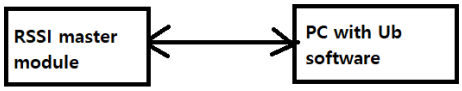

Fig. 3 control room side unit

The RSSI module Receiving Signal Strength Indicator is received the data information can stored in PC with VB software. [1][2][6]The soldiers health status will be measured to using bio sensors Temperature Sensor, Pulse Sensor, Gyroscope Sensor, Alarm Sensor. The gyroscope sensor is measured human body angle. When the soldier fall down in battlefield it should measured the angle and the soldier would analyze critical or not.

The soldiers are guiding from the control room, it track the soldiers exact location and his health status. The body Temperature can be measured by the Temperature Sensor. The heart beat can be measured by the Pulse sensor at real time. The paper proposed with existing equipment in use. Data originating from sensors and [5][8]GPS receiver is processed and collected using ARM processor. The GPS is longitude and latitude it helps immediate location details and keep in mind the wearable of every soldier. RSSI module can strength being signal from the receiving data so the soldiers can easy to communicate the others and guiding to the soldier.

1) *Arduino UNO*: [4]Arduino UNO is an open-source electronics equipment based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor and a finger on a button, or a Twitter message - and turn it into an output - starting a motor, turning on an LED, publishing something online.

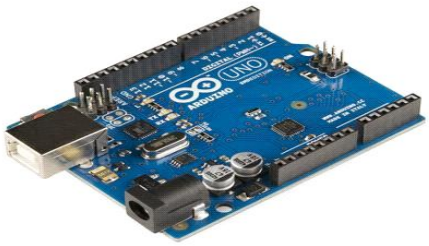

Fig. 4 Arduino UNO

2) *RSSI (Received Signal Strength Indicator)*: RSSI is a Received signal strength Indicator the signals are strength to the information collections. The soldier's information are gathered from the soldiers position that signal strength should vary greatly and functionality wireless networks. It should measures from the users. The RF signal can be strength.
3) *Temperature Sensor*: A temperature sensor is a electronic device it should measures the temperature of human body its environment and converts the input data into electronic data to record, monitor, or signal temperature changes. The soldiers body temperature will be an measured by temperature Sensor.
4) *Pulse Sensor*: The pulse sensor is a sensing of human heart rate of an fingertip. It just using the patient of an any critical of soldiers it should sensing easy to known as heart rate. It is an open source monitoring at real time. It should measures the soldiers heart rate. The sensors using an Arduino.
5) *Gyroscope Sensor*: Gyroscope sensor is also known as angular velocity. It should measured by the soldiers body angle. It is an rotational unit of at real time sensor. The soldiers total body angle of measures by this sensor. The angular rate are known to the perfect position in the body angle.
6) *LCD (Liquid-Crystal Display)*: A liquid-crystal display is a flat-panel display. The panel display for using soldiers alert or warning at the real time. The crystal will be combined and polarized. It is not emitting light directly, the backlight are produce image in color or monochrome.
7) *Buzzer*: The buzzer is an audio signaling device. It should an electric and mechanical of sound signal from the soldiers at real time. It types of buzzers are beeper, timer and alarm it should confirmation of users.

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V. RESULT

The results of proposed system shown in table 1 and fig 5. When the soldier crossing the border it will automatically intimate to the control room and distance will shown in LCD display. Then GPS will tracking the soldiers longitude and latitude distance. It should automatically send the information through the Email/SMS. The soldiers body temperature is increase or decrease as known as temperature sensor and it shown in display. If the soldier can be heart attack patient, it should measured heart rate by the pulse sensor.

TABLE I
Parameters Of Sensors With Their Result

Parameter	Sensed values
Pulse	82 bpm
Temperature	34 c
Gyroscope	90 degree

Fig. 5 Results for Proposed System

The system will send Email/SMS along with the location information of soldier to base station. The Arduino UNO board will shown in fig 6. The kit will wearable and tiny system. The LCD display shown in heart rate and temperature. When soldier crossing the border it will shown the distance in display. It automatically sent the information in control room.

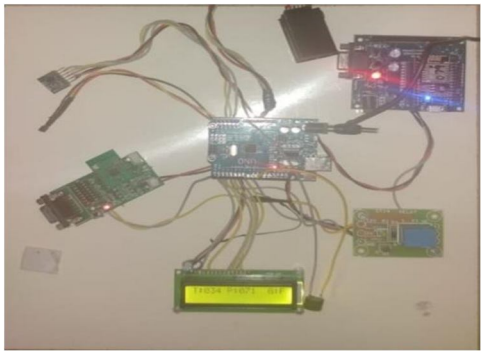
Fig. 6 Micro controller IC Board

The micro controller IC board is an stored the data information. Which person was in critical stage can shown in control room. The Power supply is an low, it should collect the information from the human body and it stored in micro controller.

VI. CONCLUSION

The subjective of this paper is to present the information about the Soldiers Border Alert System with Fall Detection Monitoring is successfully implemented and executed which can be capable of collect and process the soldiers body parameters from the human body. It sensing the human body temperature and heart rate by the sensors. It easy to tracking the soldier's exact location. It should charging from directly sun light of an solar harvesting.

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VII. ACKNOWLEDGEMENT

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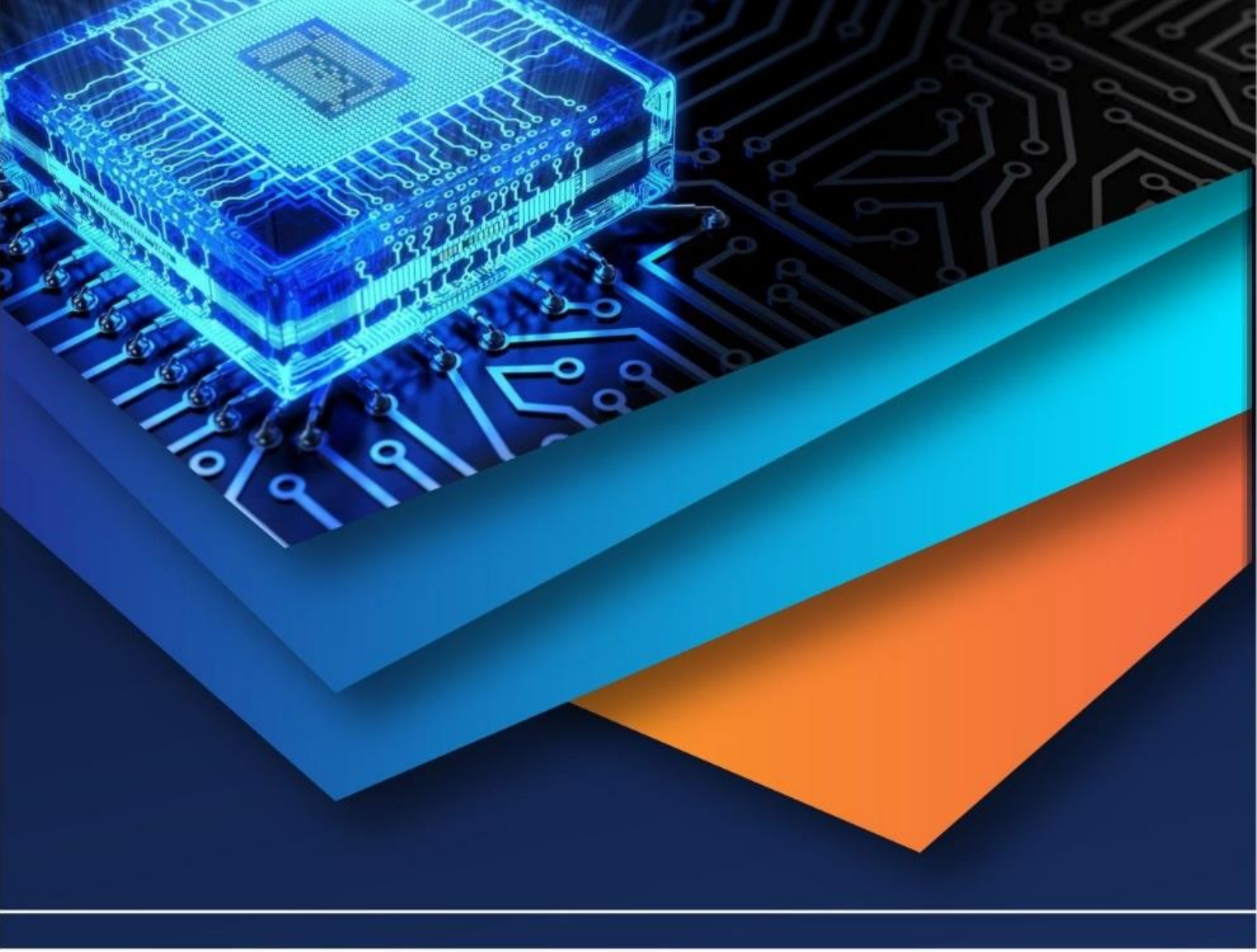

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