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Sign Communication and Health Monitoring System for Armed Forces

Sumathi.P[1], John Clement Sunder.A[2], Suganthi.T[3], Saravanakumar.P[4]

Electronics and Communication Engineering, BIT, Sathyamangalam, India[1-4]

Abstract: This project improves the safety of the soldier by continuously monitoring the soldier blood pressure and also provides secure communication between co-soldiers. This project is embedded with the glove and helmet. The helmet attached with PIR sensor which detects the presence of human in front and back of the soldier. With the help of PIR sensor the alert is given to the soldier when the enemy is in GHILLIE Suit.The blood pressure sensor measures the pressure of the soldier. If the pressure reduce to certain limit message is sent to the central control office via GSM. With the help of this communication, the commander can easily back up or make further decision to protect the soldiers. It also helps to track the injured soldier for medical assistance.

Keywords: GSM,PIR,Health monitoring,CCO,Sensors

I.INTRODUCTION

Sudden death or fatal injury is not uncommon among soldiers during both training and battlefields actions. To provide real time health monitoring, each soldier should be equipped with a comprehensive health monitoring system. It also has a blood pressure sensor which monitors the blood pressure of the soldier continuously. If the soldier is injured the information is transferred to the central control office immediately for medical assistance.The PIR is an electronic sensor that detects the presence of the human surrounding in its field.The glove is fitted with the flex sensor which helps in communication among the soldiers. The project is mainly used in battlefield for armed forces.To give medical assistance to the injured soldiers by sending location to CCO.It helps in easier communication between the soldiers.

II.OBJECTIVE

The main objective is to monitor blood pressure of the soldier using pulse sensor and informs abnormal variation to head office.It also helps in the detection of human in the nearby surrounding by using PIR sensor. It has a button which immediately informs the CCO for additional help.The flex sensor in the gloves which helps in communication with co-soldier.

III.PROPOSED SYSTEM

(A) BLOCK DIAGRAM

- The glove is fitted with blood pressure sensor.
- The glove also monitors the blood pressure of the soldier and conveys message to head office in case of emergency.
- The glove also has PIR sensor senses the thermal movement in the surrounding. If it finds the movement it intimates the soldier with a vibration motor.

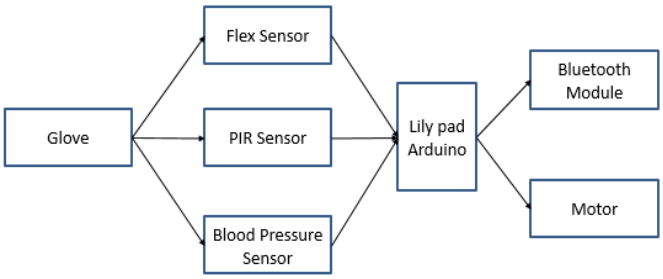

Fig .1:Block Diagram

(B) Configuration:

The glove has a PIR sensor, arduino and motor. The PIR sensor which detects the presence of human activity. When there is a presence of human, it intimates the soldier by rotating the motor.The Heart beat sensor is connected

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with the Lilly pad Arduino to measure the beats per minute. The Lilly pad Arduino is also connected with Flex sensors to convert sign language into Morse code for security reasons. These are connected to Bluetooth for communication. The GPS and GSM module are used to transmit the message with location for the medical assistance of soldiers. There is another button which helps in the communication with CCO for additional help.

(C) PIR Sensor

All objects with a temperature above absolute zero emit heat energy in the form of radiation.Usually this radiation isn't visible to the human eye because it radiates at infrared wavelengths.The term passive in this instance refers to the fact that PIR devices do not generate or radiate energy for detection purposes.They work entirely by detecting infrared radiation emitted by or reflected from objects. They do not detect or measure "heat".

(D) Pulse Sensor

The Pulse Sensor is a plug-and-play heart-rate sensor for Arduino. It is an integrated optical amplifying circuit and noise eliminating circuit sensor

(E) Flex sensors with Arduino

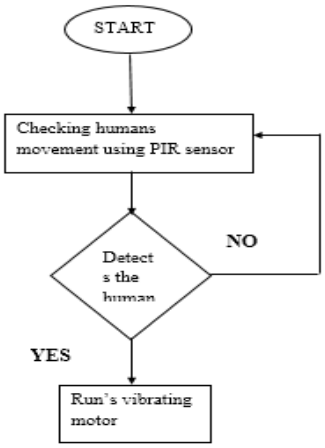
A flex sensor or bend sensor is a sensor that measures the amount of deflection or bending.Usually, the sensor is stuck to the surface, and resistance of sensor element is varied by bending the surface. Since the resistance is directly proportional to the amount of bend it is used as goniometer, and often called flexible potentiometer.

(F) Description:

The PIR sensor output is connected with the P0.0 of the microcontroller. The output from the microcontroller is connected from P1.0 to the input of the motor. The microcontroller is also connected with crystal oscillator. When the humans are detected it runs the dc vibrating motor.The blood pressure sensor is connected with the Promino Arduino to measure the blood pressure of the soldier. The blood pressure sensor output has connected with the analog output.

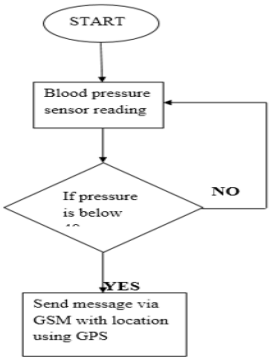
IV.IMPLEMENTATION OF PROJECT

(G)IMPLEMENTATION OF PIR SENSOR



The PIR sensor is placed on the front part of the helmet. It is difficult to find the enemy in GHILLIE suit. With the help of the PIR sensor the soldier can be alerted.

(H) IMPLEMENTATION OF PULSE SENSOR



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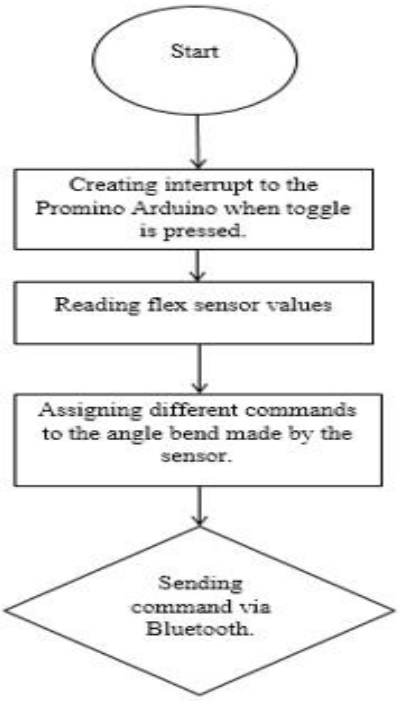
(I) IMPLEMENTATION OF FLEX SENSOR:



IV. RESULT AND DISCUSSION

(J)RESULT OF PULSE SENSOR

```
Heart-Beat Found BPM: 80
Heart-Beat Found BPM: 71
Heart-Beat Found BPM: 48
Heart-Beat Found BPM: 48
Heart-Beat Found BPM: 50
Heart-Beat Found BPM: 53
Heart-Beat Found BPM: 57
Heart-Beat Found BPM: 63
Heart-Beat Found BPM: 70
Heart-Beat Found BPM: 79
Heart-Beat Found BPM: 89
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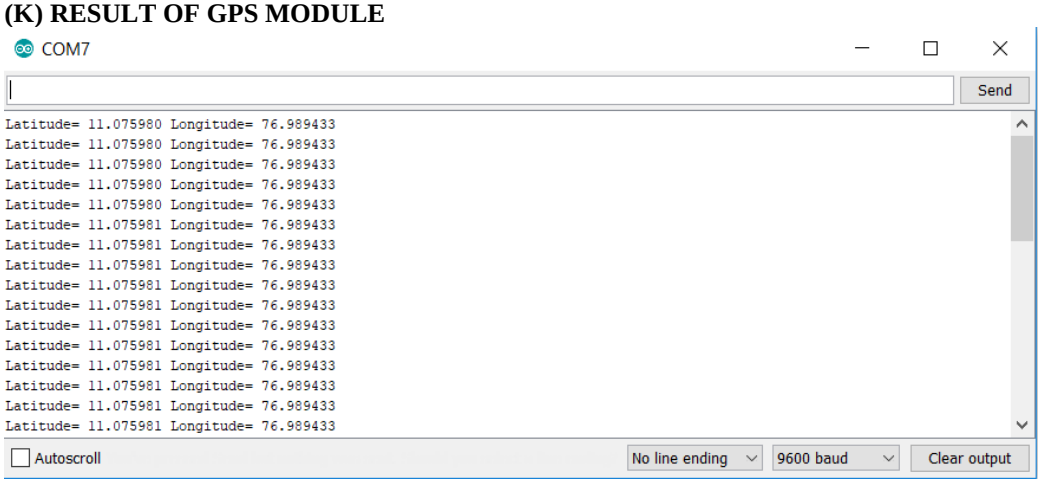
BPM when sensor is in hand

(K) RESULT OF GPS MODULE



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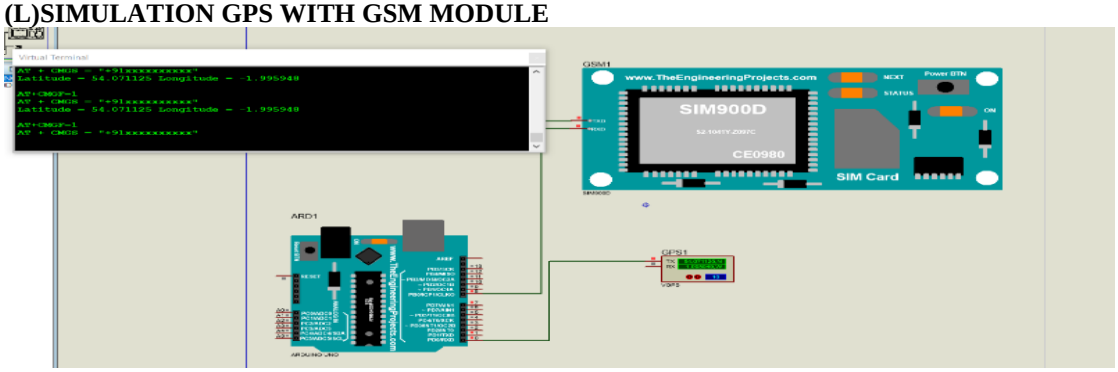
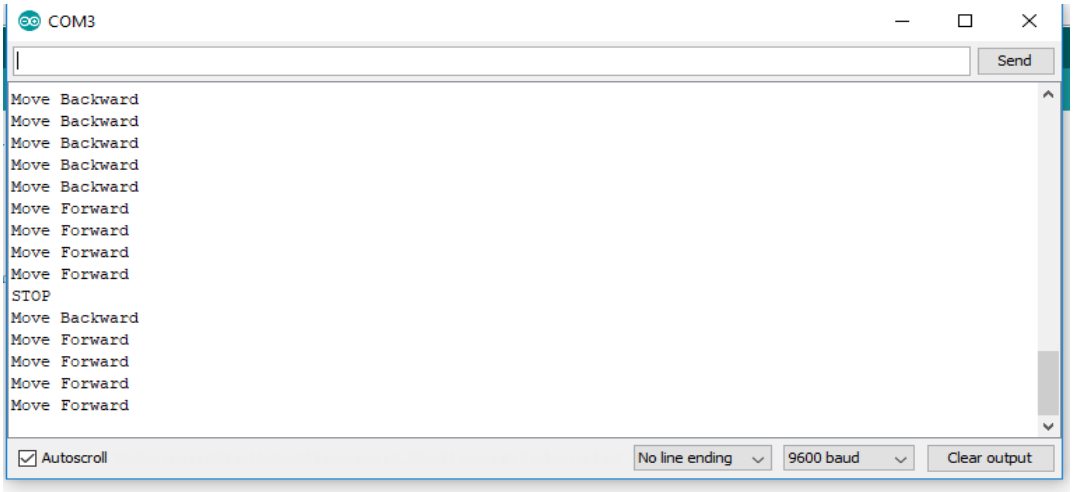
(L)SIMULATION GPS WITH GSM MODULE



(M) RESULT OF MESSAGE SENT TO CCO OF LOW BEATS PER MINUTE

(N)COMMANDS OF FLEX SENSOR



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V.CONCLUSION

Thus the circuit has been designed and this is used in the detecting the enemy's presence. A soldier cannot find the enemy in the GHILLIE suit. This is used to detect the presence of humans around them. The Blood pressure sensor is used in measurement of blood pressure per minute. If the blood pressure gets below 60, it intimates the central control office where the soldier can get the medical assistance and commander can get to know the problem and can attack the enemy with the other plan. This project helps in communication between the soldiers by using flex sensor. The soldier can also call for help by using a single button where the head office comes to know that there is requirement of additional powers or to back up the soldiers.

VI.FUTURE WORK

This project implemented with Arduino. If there is a need to perform some more operation Arduino can be replaced with advanced technologies like raspberry pi. We have used Bluetooth technology to transmit information from one person to another person. Further we can move to Wi-Fi technology, because the range covered by Bluetooth is limited. Since we have used sensors, there may be advance sensor technology may arise. It can be replaced for this sensors this will help us to predict more accurate readings. We are planning to make advanced suite for our armed force in battle field with our upcoming technologies.

REFERENCES

[1]. Human detection using PIR sensor
[2]. https://ieeexplore.ieee.org/document/4632611/
[3]. https://ieeexplore.ieee.org/document/8342790
[4]. https://www.elprocus.com/passive-infrared-pir-sensor-with-applications/
[5]. Lillypad Arduino: https://create.arduino.cc/projecthub/synergy-flynn-18/blood-pressure-sensor-3f6c16
[6]. Blood pressure sensor
http://www.dailymail.co.uk/news/article-2682778/An-electronic-skin-gold-wires-developed-help-monitor-blood-pressure-pulse-heartbeats.html