A Conceptual Framework for Safe Guarding Soldiers Through Wireless Network

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Abstract:- **Since life began on Earth, Army soldiers are protective shield of every nation. But when comes to their protection we are not making large steps to safe them. Though there are many technologies, most of them are not helpful to save their life. we still use the old bullet proof jackets which reduce the impact of bullet. These jackets does not have an warning system that would alert to the command centre and the command centre also does not accurately understand the difficulties faced by the soldiers in the war field through signals. This problem will overcome by our new proposed method with the help of WBSNs sensor and embedded system. In the proposed system, to monitor and control automatically the physical status of each and every soldier. It will track the sensors are placed on soldiers bullet proof jackets during emergency situations. The specially designed Wireless Body Sensor Network (WBSNs) and vibration sensor are used to sense if any bullet hit the soldiers during war field and defence area, soldier body temperature and breathing condition.**

Keywords - WBSN sensor, atmega8l, zigbee, lcd display

I. INTRODUCTION

In our nation, everyone run their life in a peaceful way. But the soldiers doesn't have security for their life. So in our proposed system, we are providing a jacket with a single layer of plate. Technologies used in these jackets are still the same that used in the existing method. In this proposed system the technology is going to make a like in the protection of soldiers. Each soldier is given with a particular code which is stored in the main server. It is going to be provided with their sensor each has its own purpose. It will help to monitor the position and give their status about respiration body, temperature and bullet impact. It also monitor and control via zigbee and wifi.

In present system, bullet proof jacket doesn't have any technical devices, so it's not able to help the soldiers and does not indicate their health condition. If any soldier got injured, the command centre will not know until they are brought to base station or other soldier finds them. In the proposed system , temperature and respiratory sensor, are used to monitor and control the body temperature and breathing level conditions. If body temperature decreases below the normal level, the heater in automatically ON which is inserted in bullet proof jacket .If their respiration levels goes below to normal level, the Bluetooth zigbee module will indicate to the command centre about the soldiers health condition and the command will provide medicines to the defence area. It's all going to make a new on the field of protection.

II. EXISTING SYSTEM

In the soldier tracking system, we use several components such as GPS module, Temperature sensor, RF transceiver and graphical LCD. All those components are interfaced with microprocessor which has fast speed response and accuracy. Initially, GPS module is given to the soldier which gives connection between control centre and soldier. The accurate location about soldier cannot be identity easily, after that temperature sensor and pulse rate sensor is used to measure the body temperature and pulse rate of the soldier. Through the graphical LCD, soldier can see the temperature and pulse rate. RF transceiver is used to track the soldier through GPS module which can transmit the information to base station. Each of those component are controlled or monitored by the soldier. If soldier need to give information about his location means they use radio transmitter. All those technology are given to the soldier and carried with them**.**

III. DEMERITS OF EXISTING SYSTEM

In the existing system during rainy season, temperature sensor will not work properly, if enemy hack the system that may create danger for security system. While fighting with enemy, there may be a chance of missing pulse rate sensor because pulse rate sensor is fixed in the hand of soldier. It will damage the jacket due to bullet strike, then the entire communication will be lost.

RF transceiver range increases due to the desired distance, the cost of RF transceiver also get increases widely. GPS increases the cost of project instead of GSM , we use GSM which is used to tracking of soldier. On the other hand ,GSM reduces the overall cost of the project.

IV. PROPOSED SYSTEM

Army soldiers are one who sacrifice their life to our nation. Therefore the main concept of our paper is to develop a wearable electronic jacket, it can be integrated into military protective cloth. Bullet proof technology is selected as one of the most promising safe protective method. In a battle field if our soldier is shot or harmed by

enemy, it will sense by using external sensor (vibration sensor) and internal sensor (WBSNs).

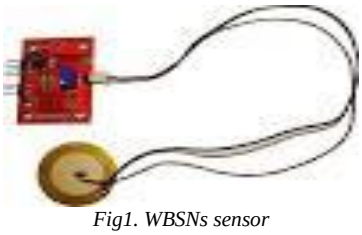


Fig1. WBSNs sensor

Then it automatically send SMS to our army office with the help zigbee. If the soldiers strength is not enough against enemies strength, then we send extra force to the battle area.

A. *The Role Of WBSNs*

In this paper we introduced a specially-designed wireless body sensor network (WBSNs) development platform for safeguarding soldiers. Recent improvements in signal processing and very-low-power wireless communication have motivated great interest in the development and application of wireless technology in health care and biomedical research, including Wireless Body Sensor Network. WBSNs miniaturized persistent health monitoring devices have become practically feasible. It is a wireless network used for communication among sensor nodes operating on or inside the human body in order to monitor vital body parameters and movements. In addition to provide continuous monitoring analysis of physiological parameters , the processed Wireless Body Sensor Network incorporates context aware sensing for increased sensitivity and specificity.

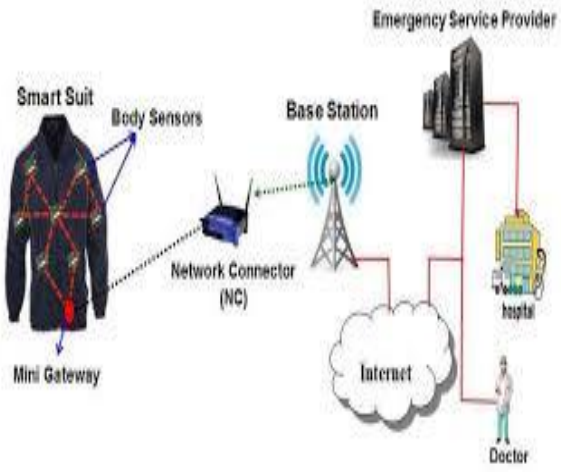
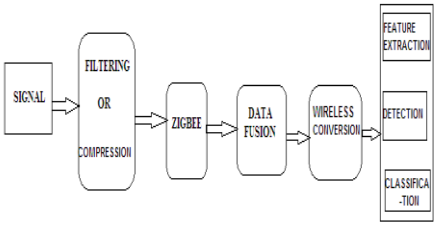


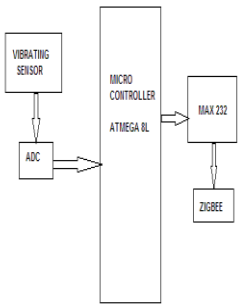
Fig 2. signal transmission

V. BLOCK DIAGRAM

A) Internal Method



B) External Method



The block diagram of soldier tracking and health monitoring system using embedded technology. In the proposed system ,to monitor the blood pressure , respiratory rate, temperature and vibration if any bullet hit the body during the period of war by using the following sensor.

- Vibration sensor
- Wireless body sensor network (temperature, pressure,accelerometer)

We include solar panel with battery which provides supply voltage to the system. The external sensor (vibration sensor) are used to sense the vibrations whenever there is a strange noise or any soldier attacked by any bullet or collide with any rocks the vibration get sensed. The sensed signal get transmitted to army office with the help of zigbee.

WBSNs (internal sensor) nodes are deployed in ,on or around the soldier body. Due to the locations the nodes are deployed, they will move as the soldier moves. Sensor nodes which are placed in the body collect physical data and perform initial processing. These sensor can be inhaled/ consumed into the body, such as a camera pill and visual sensors.

The proposed framework consist of three major components for real-time applications, namely

- Sensing and preprocessing
- WBSN data transmitting
- Data analysis

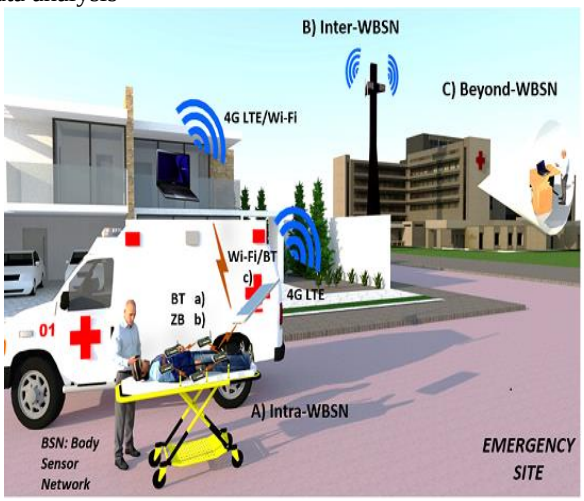


Fig 3. Base station with emergency site

C) Sensing and Pre-processing

It contains a number of sensor for capturing a raw data related to medical phenomena including blood pressure, respiratory rate, ECG and EEG.

D) WBSN data transmitting

It makes most of the application – specific wireless protocols such as zigbee to transmit data from body sensor to gateway. Wi-Fi protocol may be used for intensive data transmission.

E) Data analysis

Analysis of raw data including possibly detection and classification of medical anomalies will occur here. It provide accurate data for the army office so that immediate diagnosis service by doctors and medical experts with emergency treatment systems**.**

VI. CONCLUSION

In this paper, the conceptual frame work for safeguarding soldier through WBSNs that allows preventing the soldier during the abnormal condition such as bullet hit in battle field. By this concept we can entirely monitor the soldier and his condition health by sending data to the main station. From the received data the specific doctor and his medical team is sent to the spot .This device need only small amount of power to operate the process. It is a life saving application, our framework is a vital role to safe guard soldiers in a safety way.

VII. FUTURE ENHANCEMENT

India is a home grown to an extensive variety of animals, birds and fish species which is one of the heritages of India. Now a days the rate of extinction is high. Even though we safeguard animal in national park there is threat to their lives. Since animals cannot talk ,they pass on all sort of messages using touch , smell and sound. In such situation our proposed framework can be used to prevent them from extinction .This technology can also be modified and implemented for coma patients.

REFERENCES

[1] Shruthinikamal, Supriyapatil, ”Gps based soldier tracking and health indication systems”,vol 2 issue 3, march 2013.
[2] Jounirantakoko, Joakimrydell and Peter Stromback, ”Accurate and reliable soldier and fast responder positioning,multi sensor system and cooperative location”,April 2011
[3] K.P.Safeer, Pragatigupta,”Wireless sensor network for wearable physiological”,vol 3,no.5,May 2008
[4] C.Hertleer, A.Tronquo, H.Rogier and L.Van Langenhove,”An aperture- coupled patch antenna for integration into wearable textile systems”,vol 6,pp. 392-395,2007