SAVE THE HEROES USING TRACKING SYSTEM

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ABSTRACT:

The risk of terrorists is an important consideration in modern safety plans for every nation. The military's soldiers have an important and essential role in this perspective. There are many things to take into consideration when it comes to security. Thus, many kinds of techniques or equipment are connected to soldiers for safety reasons so as to track their wellness and weaponry. If one wants to deliver inexpensive peripheral alternatives for tracking one's health, healthcare-related devices like heart rate sensors, temperature measuring detectors, and transmission and processing capabilities can be Nowadays, the military's security is an essential element of the nation's safety mechanism. There are numerous positions and methods to guarantee unit security. That makes it simple to recognize the directions. If the soldiers are having any health concerns, this project approach can be applied to their bodies to track their present health status. The global positioning system is used in this project to track the soldier's present location. Through a GSM modem, the message will be delivered to the base station. The use of this technique with sensors and a GSM modem results in a wireless system for tracking the soldiers' present location, heart rate, and body temperature. The soldier's heart rate will be visible on the LCD screen. If the temperature is abnormal, a GSM module alert should be sent to the control room. Additionally, if there is ever an emergency

Keywords: M-health, GPS, GSM, Tracking System, Detectors

1. INTRODUCTION

As is widely understood, a nation's safety is seriously compromised by enemy warfare. Armed forces personnel play a crucial and significant role. There are various factors to take into account when it comes to security. The warriors of the future promise to be more technologically advanced in any vital circumstance, such as combat or any covert mission. Many research platforms are currently being set up around the globe, and they both aim to develop completely new combat techniques.

Helmet-mounted displays are capable of displaying images and footage from various members of the team as well as a range of physiological sensors to monitor health indicators.

These devices possess the ability to increase alertness to correspond with the situation, not only for individuals on the battle field but also for the entire army staff at the base station, and they can transfer information through a wireless connection.

Yet the primary goal was to create a small technology that could produce the needed outcomes. The fact that soldiers cannot link to base stations presents the initial and greatest difficulty in fighting.

In addition, accurate communication between soldiers is necessary for careful forecasting. For the nation to be protected, the defense ministry must be successful.

The major goal of this project is to give the armed forces the ability to track a soldier's current geographical location and to check their health, particularly their pulse and body temperature, in order to determine if they are experiencing difficulties.

The central station can effortlessly identify a soldier's position as the Global Positioning System transmitter transmits the soldier's present position in conjunction with the communication pattern. We can quickly identify the soldiers' well-being with the aid of this system and give them access to immediate assistance.

This device permits telemedicine as well as keeping track of these soldiers. M-Health, which makes it possible. Medical sensors and health-related communication equipment are a good description of the M-Health. Advanced sensors are fastened to soldiers as part of a continuous location and medical tracking system, and the screen, power sources, the Global System for Mobile, and circuit are contained in an envelope that is placed in the soldier's container. These have a private web server integrated into them for total portability. Using a wireless connection, this personal server will offer connectivity to the server at the base station. The unit also contains a Global Positioning System (GPS) tracking mechanism that allows the soldier's location to be tracked. Each device includes a GSM module, which permits

Each device features a module called the GSM module, which makes it possible to communicate between both sides. By doing so, it is possible to support or help a soldier and complete the task at hand. It is crucial for the military base station to be aware of the situation and the state of each person's health because any soldier could be in a position to enter an enemy region at any time. In our idea, we have aimed for the concept of following the soldier and also keeping track of their health status during the conflict, which enables the military staff to establish the battle's plans.

Due to the heavy walkie-talkies carried by warriors, we are concealing the replacement system by using sensors, GPS, and a keypad to track the soldier. These walkie-talkies operate on a certain frequency and are essentially radio gadgets. The disadvantage of walkie-talkies is that they require spoken communication, which might be disrupted by background noise on the battlefield. In cases where the soldier is unable to speak to the control room, there is no other method to communicate the message. However, with our project, we are eliminating the necessity for oral communication since the control room will automatically know the soldier's health status and the soldier will be able to send messages using code without speaking. Walkie-talkies are huge because they require hefty batteries.

History-

Soldiers get injured and occasionally lose their lives during battle and military search missions. Army base stations require a GPS device to locate soldiers, WBASNs to detect health-related parameters in soldiers, and a wireless transceiver to wirelessly transfer the data in order to locate soldiers and offer health monitoring. Growing technology has been discussed by Hong Beng Lim, Di Ma, Bang Wang, Zbigniew Kalbarczyk, Ravishankar k. Lyer, and Kenneth L. Watkin on a variety of wearable, portable, light-weight, and small-sized sensors that have been developed for monitoring human physiological data. The body sensor network (BSN) is made up of numerous biomedical and physiological sensors that can be attached to a person's body to monitor their health, including blood pressure sensors, electrocardiogram (ECG) sensors, and electrodermal activity (EDA) sensors. During battle and military search missions, soldiers suffer wounds and occasionally pass away. In order to find soldiers and provide health monitoring, army base stations need a GPS device to locate soldiers, WBASNs to detect health-related indicators in soldiers, and a wireless transmitter to wirelessly transport the data. Hong Beng Lim, Di Ma, Bang Wang, Zbigniew Kalbarczyk, Ravishankar k. Lyer, and Kenneth L. Watkin have described the development of a variety of wearable, portable, light-weight, and compact sensors for monitoring human physiological data.The electrocardiogram (ECG), blood pressure, and electr cutaneous sensors are just a few examples of the biomedical and physiological sensors that can be connected to a person's body to monitor their health as part of the body sensor network (BSN).

India faces a significant security problem as a result of its land borders with six nations: Pakistan, Bangladesh, China, Myanmar, Nepal, and Bhutan, as well as the Line of Control in Jammu and Kashmir. In order to deter cross-border smuggling and infiltration, India also has the longest flood-lit border fencing in the world with Pakistan and Bangladesh. Other borders, however, have boundary pillars and mutually acknowledged geographical features, although occasionally flash points do emerge. he high rate of suicides and fratricide deaths reflects the high human cost of border patrol since working in isolated and challenging border posts causes extreme psychological stress. Additionally, the troops, who are in charge of guarding our borders, lose a lot more jawans annually than the Indian army does during times of peace. In fact, it was this that prompted the Central Armed Police Forces (CAPF) jawans' next of kin to receive a uniform policy of Rs 35 lakh in compensation from the Ministry of Home Affairs (MHA).

Our borders will be protected by four of our

CAPFs, according to their mandate. These include the Assam Rifles, the Indo-Tibetan Border Police, and the Border Security Force (BSF)

It can transmit the soldier's sensed and processed information in real time. By using body sensor networks, it allows the army command center to keep track of troop health parameters like heart rate, body temperature, etc. Continuous measurements of the warriors' characteristics are taken, and wireless GSM communications are made.

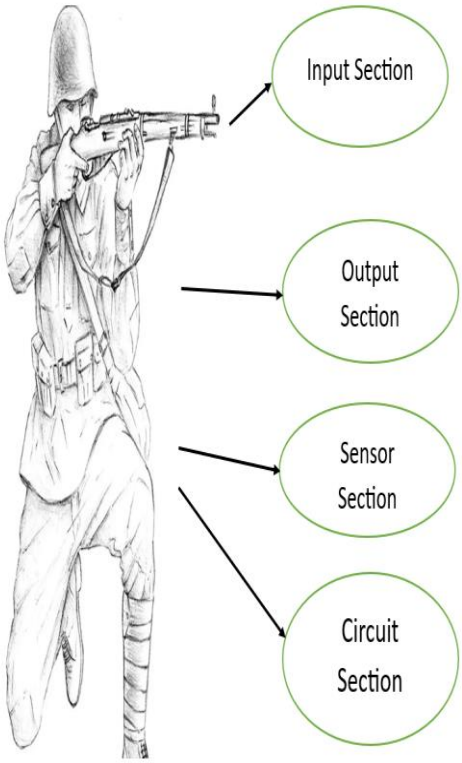


Fig .1 Different Section of Project

The region-by-region examination of the armed forces and economic balance in 2014, reveals how defense and security policies, such as the trade in weapons and military equipment, are affected.[2]

The implemented clothing and equipment are used to verify the appropriate operation of a series of Twelve complete sets have been operationally evaluated and recorded using cutaneous reaction, readings of temperature, and the heart disease. The experiment's findings demonstrate that the wearable measurement system we developed performs in accordance with the values and guidelines used in metal stress trials. As a result, it will be applied to dozens of health volunteers during the project's next stages.[1]

The detailed statistics cover the main training initiatives for both UN and non-UN deployments as well as worldwide comparisons of military personnel and defence spending. Only if the base station has access to the soldier's position and health state can these numbers be decreased. While stationed in isolated places, the soldiers encounter numerous difficulties. The main challenges with the soldier's safety include a lack of communication, an inability to determine their current location, and a lack of medical care.[3]

Soldiers' major cardiac conditions and fluctuating body temperatures are tracked by GPS tracking equipment, which report information to the base station. [4]

Regarding their health, the soldiers are dealing with numerous problems. The detailed statistics cover the main training initiatives of UN and non-UN deployments as well as worldwide comparisons of military personnel and defence spending. Only if the base station has access to the soldier's position and health state can these numbers be decreased. [6]

The Indian Armed Forces, with 1,200,255 active personnel and 990,960 reserve personnel, is home to the third-largest standing army in the world. While the soldier is dealing with any injuries or other health difficulties, this may raise the soldier death rate because of the army's communication problems. It was discovered that the death rate of troops who died from health problems was higher than the death rate of soldiers who died on the battlefield.[5]

Threats from foes in recent days have mostly disrupted the security strategies of several states. so that the military's soldiers have a crucial and important function. Several factors raise concerns about the soldiers' security. They are equipped with numerous devices and pieces of technology that track their health. [8]
The country's defence department is primarily responsible for the nation's security. This system will be helpful to the soldiers on any mission in a variety of ways. Using global positioning technology, we may use this technology to determine the soldier's whereabouts. M-Health can assist in making it possible. Medical sensors, mobile computing, and communication technologies are all well-known.[9]
We employ the Body Sensor Network, which may be positioned near or inside a body and is made up of several physiological and biomedical nodes, for the real-time health monitoring system. The interconnected BSNs that function as a system and play a significant part in the real-time health monitoring of the soldiers are the main topics of discussion in this essay.[11]
The region-by-region examination of the military and economic balance in 2014 reveals how defence and security policies, such as the trade in weapons and military equipment, are affected. It reveals the in-depth entry descriptions of 171 military capabilities by exhibiting the essential equipment inventories and defence economics. The detailed statistics cover the main training initiatives of UN and non-UN deployments as well as worldwide comparisons of military personnel and defence spending.[7]
Zigbee-enabled wireless technology makes it possible to keep track of a patient's health status and notify a doctor right away if there are any problems so that the doctor may offer quick assistance. [10] S. L. Bangare et al. [14-18], P. S. Bangare et al. [19], Xu Wu et al. [20], V. Durga Prasad Jasti et al. [21] and Suneet Gupta et al. [22] have proposed and worked lot of interesting research projects.

2. IMPLEMENTATION

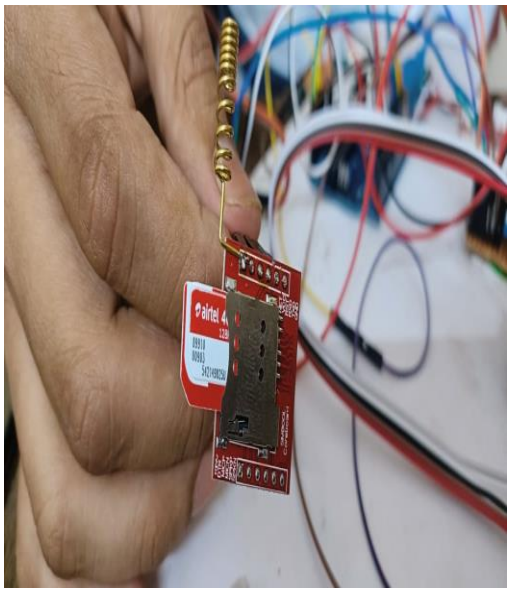


Fig. 2 SIM for Implementation

The hardware used in this project consists of a sensor with a GSM module for communication, which enables the location tracking and health detection of the soldier using GSM and GPS in an emergency.
The soldier's body is fitted with sensor components that can measure things like body temperature and heart rate. Here, a sensor was used to measure the soldier's heart rate and display the results on an LCD screen. When the body temperature is abnormal, a temperature sensor will automatically report it to the control centre and the guardian or other soldier using a GSM connection. In an emergency, a soldier can use this programme to touch the control room and request assistance.

2.1 BLOCK DIAGRAM

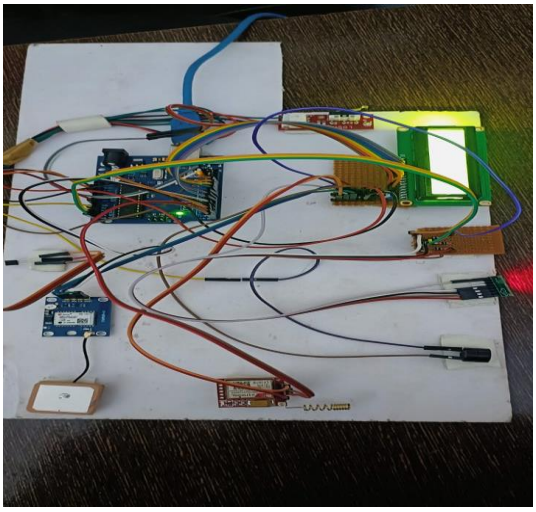
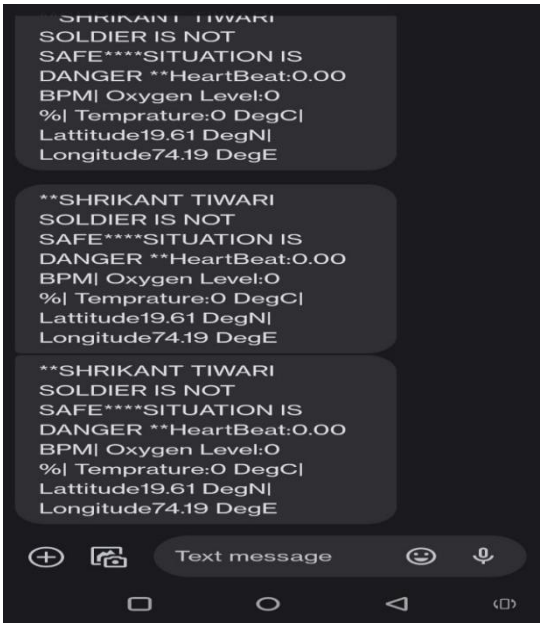


Fig. 4 Embedded setup of the proposed system

The AVR controller, regulator, temperature sensor, power source, heart-rate sensor, emergency button, GSM module, buzzer, and LCD display are all included in the circuit schematic. For voltage regulation from 12 volts to 5 volts, the regulator is linked to a 12 volt power source. The AVR controller device subsequently receives a 5-volt supply. The VCC and GND pins are used to connect the regulator. The controller device is coupled to a temperature sensor. Three pins are present. Another pin is connected to the controller device, and the positive and negative pins are connected to VCC and GND. The heartbeat sensor is attached to the controller device. Both the positive and negative terminals are linked to GND and VCC, respectively. connected to the controller device by an output pin. Controller-connected LCD display data pins d2, d3, d4, d5, d7 are linked to the positive port according to order, and Ground is connected to the ground pin. The digital pin on the control device is connected via the panic button. Connected to the controller's TX and RX pins is a GSM module device. The controller's TX and RX pins have connections to the GPS module.

3. RESULT



The temperature sensor will detect when the soldier's body temperature exceeds 38 degrees Celsius and will warn the base station. If the soldier presses the emergency alert button as soon as the temperature rises, the worried soldier's latitude and longitude information is automatically sent to the base station, where they will receive assistance. The heartbeat sensor utilised here will automatically recognise and display a warning if the soldier's heartbeat rate increases more than three times the normal rate. A message alert will be sent to the base station if a soldier's temperature increases suddenly. The soldier's ID is also included in this message, followed by their

4. CONCLUSIONS

The military personnel and the headquarters never seem to be able to communicate. The control center keeps track of the troops' health as we work to solve the issue, and if a soldier needs assistance, he may quickly transmit a signal from his current location to the base station. The method we employed here will serve as a lifeguard for every soldier when they encounter difficulties or medical issues.

REFERENCES:

[1] Srinivasan, P., Khan, A.A., Prabu, T., Manoj, M., Ranjan, M., & Karthik, K.P. (2020). Heart Beat Sensor Using Fingertip Through Arduino. Journal of Critical Reviews (2020), ISSN- 2394- 5125 Vol 7, Issue 7, pp.1058-1060.

[2] R. S, Dr. Sabeenian. (2020). Long Term Monitoring of Sleep Disordered Breathing Using IOT Enabled Polymer Sensor Embedded Fabrics. International Journal of Psychosocial Rehabilitation. 10.37200/IJPR/V24I5/PR2020718., ISSN: 1475-7192, 24 & 7093- 7010, May 16, 2020.

[3] Seoane, Fernando & Ferreira, Javier & Alvarez, Lorena & Buendía, Rubén & Ayllon, David & Llerena, Cosme & Gil-Pita, Roberto. (2013). Sensorized Garments and Textrode-Enabled Measurement Instrumentation for Ambulatory Assessment of the Autonomic Nervous System Response in the ATREC Project. Sensors (Basel, Switzerland). 13 (7). 8997-9015. 10.3390/s130708997.

[4] Kumar, G. Rasika, V.Patil, and S. Bobade (2019), Health Monitoring and Tracking of Soldier Using GPS, International Journal of Research in Advent Technology, vol.2, no.4, pp. 291- 294,Apr. 2019.

[5] S. Sharma, S. Kumar, A. Keshari, S. Ahmed, S. Gupta and A. Suri (2018), A Real Time Autonomous Soldier Health Monitoring and Reporting System Using COTS Available Entities, Second International Conference on Advances in Computing and Communication Engineering (ICACCE), Deharadun-India, May 2018, pp. 683-687.

[6] Afef Mdhaffar, Tarak Chaari, Kaouthar Larbi, Mohamed Jamaiel and Bernd Freisleben (2018), IoT Based Health Monitoring via LoRaWAN, International Conference of IEEE EUROCON, vol. 115, no. 89, pp.2567-2953,2018.

[7] R. Shaikh(2017), Real Time Health Monitoring System of Remote Patient Using Arm7, International Journal of Instrumentation, Control and Automation (IJICA), vol. 1, no. 3-4, pp.102- 105, 4, 2017.

[8] R. Kumar and M. Rajasekaran (2018), An IoT based patient monitoring system using raspberry Pi, International Conference on Computing Technologies and Intelligent Data Engineering, Kovilpatti-India, Jan. 2016, pp. 1-4.

[9] International Institute for Strategic Studies (3 February 2018). The Military Balance 2014, pp. 241–246. London: Routledge. ISB 9781857437225.

[10] M.V.N.R. Pavan Kumar, Ghadge Rasika Vijay, Patil Vidya Adhikrao, Bobade Sonali Vijay kumar (2014), Health Monitoring and Tracking of Soldier Using GPS, International Journal of Research in Advent Technology, Vol.2, No.4, April 2014 E- ISSN: 2321-9637.

[11] Shruti Nikam, Supriya Patil, Prajkta Powar, V.S.Bendre (2013), GPS Based Soldier Tracking and Health Indication System", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol. 2, Issue 3, March 2013

[12] G. Raj and S. Banu (2013), GPS Based Soldier Tracking And Health Indication System With Environmental Analysis, International Journal of Enhanced Research in Science Technology & Engineering, vol. 2, no. 12, pp. 46-52, Dec. 2013.

[13] Lim, H.B., Ma, D., Wang, B., Kalbarczyk, Z.T., Iyer, R.K., & Watkin, K.L. (2010). A Soldier Health Monitoring System for Military Applications. 2010 International Conference on Body Sensor Networks, 246-249.

[14] S. L. Bangare, Amruta Dubal, Pallavi S. Bangare, and S.T. Patil (2015). Reviewing Otsu's method for image thresholding. International Journal of Applied Engineering Research 10, no. 9 (2015): 21777-21783.

[15] S. L. Bangare, G. Pradeepini, and Shrishailappa Tatyasaheb Patil (2017). Neuroendoscopy adapter module development for better brain tumor image visualization." International Journal of Electrical and Computer Engineering 7, no. 6 (2017): 3643-3654.

[16] S. L. Bangare, G. Pradeepini, and Shrishailappa T. Patil (2018). Regenerative pixel mode and tumour locus algorithm development for brain tumour analysis: a new computational technique for precise medical imaging. International Journal of Biomedical Engineering and Technology 27, no. 1-2 (2018): 76-85.

[17] S. L. Bangare, G. Pradeepini, and Shrishailappa T. Patil (2017). Brain tumor classification using mixed method approach." In 2017 International Conference on Information Communication and Embedded Systems (ICICES), pp. 1-4. IEEE, 2017.

[18] S. L. Bangare (2022), Classification of optimal brain tissue using dynamic region growing and fuzzy min-max neural network in brain magnetic resonance images. Neuroscience Informatics 2, no. 3 (2022): 100019.

[19] P. S. Bangare, Pote, A., Bangare, S. L., Kurhekar, P., & Patil, D. (2013). The online home security system: ways to protect home from intruders & thefts. International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN, 2278-3075.

[20] Xu Wu, Dezhi Wei, Bharati P. Vasgi, Ahmed Kareem Oleiwi, Sunil L. Bangare, Evans Asenso, Research on Network Security Situational Awareness Based on Crawler Algorithm, Security and Communication Networks, vol. 2022, Article ID 3639174, 9 pages, 2022. https://doi.org/10.1155/2022/3639174

[21] V. Durga Prasad Jasti, Enagandula Prasad, Manish Sawale, Shivlal Mewada, Manoj L. Bangare, Pushpa M. Bangare, Sunil L. Bangare, F. Sammy (2022), Image Processing and Machine Learning-Based Classification and Detection of Liver Tumor, BioMed Research International, vol. 2022, Article ID 3398156, 7 pages, 2022. https://doi.org/10.1155/2022/3398156

[22] Suneet Gupta, Sumit Kumar, Sunil L. Bangare, Shibili Nuhmani, Arnold C. Alguno, Issah Abubakari Samori, "Homogeneous Decision Community Extraction Based on End-User Mental Behavior on Social Media", Computational Intelligence and Neuroscience, vol. 2022, Article ID 3490860, 9 pages, 2022. https://doi.org/10.1155/2022/3490860