IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 11, Issue 4, April 2023

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.379

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 4, April 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1104075 |

Smart Detection System in Defence: A Review

Shashikeerthi Shetty,Shreyas, Y S Spoorthi, Dhanush Kulal, Vidya Dudhanikar

UG Student, Dept. of ECE, Mangalore Institute of Technology and Engineering, Karnataka, India

Senior Assistant Professor, Dept. of ECE,Mangalore Institute of Technology and Engineering, Karnataka, India

ABSTRACT: The safety of soldiers in the battlefield is of utmost importance, and timely medical attention is crucial in the event of an injury. The aim of this project is to detect injuries sustained by soldiers in combat situations and quickly notify their leader. The system consists of a copper wire network integrated into the soldier's jacket, which is capable of detecting breaks in the network caused by injuries. An electronic circuit connected to the copper wire network detects the breakage and transmits a signal to a GSM module. The GSM module, in turn, includes GPS coordinates of the soldier's location and sends an alert message to the leader.

KEYWORDS**:** detect injuries;Copper wire network; GSM module; GPS coordinates; LeaderEnergy.

I. INTRODUCTION

The safety and well-being of soldiers in combat situations are of utmost importance. Injuries sustained in the battlefield can often be life-threatening, and the response time for medical assistance can be critical in saving a soldier's life.0In the field of military operations, the safety and health of soldiers are of utmost importance. The ability to quickly and accurately detect an injured soldier can mean the difference between life and death. Currently, soldiers rely on traditional methods of communication, such as radio or verbal communication, to report injuries. However, these methods are often unreliable or subject to interference, especially in remote or dangerous areas.However, identifying an injured soldier and providing prompt medical attention in a high-pressure, chaotic environment can be challenging. Traditional methods of identifying injured soldiers involve visual observation, which may not always be feasible, especially in environments with low visibility or in situations where the enemy is nearby.To address this issue, we propose a novel system that can detect injuries in soldiers via copper wire breakage in their jackets and send injury information to the leader via GSM and GPS.

Traditional injury detection methods, such as sensors and cameras, can be expensive, require high maintenance, and have limited reliability in harsh environments. Copper wires, on the other hand, provide a cost-effective and reliable means of detecting injuries in soldiers' jackets. The proposed system utilizes this technology to detect injury locations and the severity of injuries.

In addition to injury detection, the system also incorporates GSM and GPS technologies to enable real-time communication of injury information to the leader. The GPS coordinates of the injured soldier's location can be used to quickly dispatch medical personnel or evacuation teams to the site, while the GSM module allows for communication of injury information to the leader even in remote areas.

In this paper, we will present the design and implementation of the proposed system, including the copper wire network, GSM and GPS modules, and the communication protocol. We will also provide experimental results to demonstrate the effectiveness and reliability of the system for injury detection and communication of injury information.

Overall, the proposed system has the potential to greatly improve the safety and well-being of soldiers in combat situations, and we believe that our work can make a significant contribution to the field of injury detection and response in military contexts.

II. RELATED WORK

[1] In this paper uses Internet of Things (IoT) technologies to address and, at the very least, slow the progress of this issue. Each ambulance will have a GPS and GSM modem that, in the event of an emergency, will communicate its GPS coordinates to a cloud server, which will then calculate the quickest route from its current position to the hospital through the location from where the emergency call was made. The project's components include a GPS module, an Arduino UNO, and cloud computing. When this system is incorporated into the infrastructure, the paramedic

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 4, April 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1104075 |

authorities will receive a special ID and password that they may use to access the data from the modules from a cloud server.

[2] Nowadays, a country's security greatly depends on its battlegrounds. The army troops perform one of the key roles. Various actions were made to ensure the safety of the soldiers. Thus, several devices are on horseback them to watch their medical status for their safety. The bioprobes system involves several biosensor types, a transmission system, and processing capabilities, which makes it easier to develop affordable, undetectable wearable health monitoring systems. GPS is used to determine the longitude and latitude so that the location of the soldier may be quickly determined. Several military, including the Israeli Army, are looking at the possibility of integrating GPS trackers into troops' vests and uniforms so that a ground station can track their whereabouts in real time. Both clothes and weaponry are getting these gadgets now.

[3] Android is one of the most popular technologies in use today. It is utilized in a variety of industries, including gaming, communication, social media, retail, and everyday organizing, among others. Public services including police, hospitals/ambulances, fire, transportation, and food/restaurants are another area where android technology is in use. They now have online services or programmers that offer these features to users through various applications. The current system was created utilizing a basic SMS facility. Here, suggests a system that includes internet-based features like Wi-Fi, GPRS, and GPS in addition to SMS functionality. These days, security is crucial for users, thus we've included both security and anonymity. This system is easy to use and responds quickly to the user or victim in need. Anybody with a smart phone and an internet connection may monitor their real-time position, and as a result, it also displays the user's desired destination.

[4]The purpose of this effort is to provide automated security that can find, locate, and eliminate a victim for surveillance operations. Two operating ways are accessible for the device, both of which allow for the automated tracking of the target utilising a microcontroller-based system. However, the system may also be operated manually, in which case the operator has the authority to choose the target and actually fire if required. Image processing and computer vision are closely related because the computer must understand what it observes and then carry out the necessary analysis or take the right action. The procedure begins with the computer processing of the video signal from the video camera, after which the target is chosen so that it may be followed further using various image processing methods. The microcontroller unit decides to fire any unlawful person or activity within its range after choosing a target. The stepper motor is used to regulate the motion of the cannon, which is positioned on a tripod platform. After the target has been chosen, a moving camera and cannon may follow it. This automated pistol aiming system's primary goal is to guard the border through automated processes, which will minimize the need for human work.

[5] In the contemporary world, warfare is a major factor in a nation's security. The army's men carry out one of their most important and crucial tasks. Warriors' security is an important source of concern. Thus, several devices are put on vehicles for their security. They can see both their current location and their state of health. Bio-sensor systems can provide low-cost, unobtrusive wearable health monitoring solutions since they include many kinds of tiny sensing devices, transmitting devices, and process technology. With the use of this paper, troops who become lost or injured on the battlefield may now have their whereabouts and health status tracked in real time. It reduces the amount of time that the army control unit spends conducting searches and rescues. Using a GPS module and wireless body area sensor networks (WBASNs), which include sensors for temperature, heart rate, and other bodily functions, this technology allows the army control unit to track the whereabouts of troops and monitor their health. Using a ZigBee module, the GPS and sensor data will be wirelessly relayed to the other soldiers. Moreover, it's been recommended that Lora WAN network design be used to transfer signals between the squad leader and the control unit in high altitude warzones where cellular network coverage is either nonexistent or does not support data transmission. The acquired data will be uploaded to the cloud for further data analysis and predictions using the K-Means Clustering method.

[6] Hostile warfare is a crucial component of every nation's security in the society today. The army's soldiers carry out one of the most important and crucial tasks. Troops' security is an important source of concern. In order to monitor their health and any ammo they may have, several devices are put on them for security reasons. As bio-sensor technologies comprise a variety of small sensing devices, transmission modules, and computational capability, they can offer a lower, unobtrusive health surveillance options. GPS records latitude and longitude so that heading could be instantly established. Several military services, such as the Israeli Army, are considering the notion of incorporating GPS equipment into troop vests and uniforms so that field commanders may immediately monitor the movements of their soldiers. Guns and other weapons are incorporating similar detectors. RF modules can be used for strong, fairly long, soldier-to-soldier cellular networks to send information regarding spatial awareness, strategic commands, and covert

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 4, April 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1104075 |

surveillance-related data during special operations reconnaissance and other duties. As a result, we are attempting to build a basic lifeguarding service for soldiers that is both affordable and dependable.

[7] With the development and widespread usage of electronic-based devices, information and communication technology (ICT) has become an essential component of military activities. The modernization of the smart society is significantly influenced by the military. While it is normal practise in developed nations to use cutting-edge IT to carry out army operations, this is not the case in armies in developing nations like Indonesia. In order for an army career to be deemed a "Smart Military Society," it is necessary to identify the appropriate qualities for that service. On the other hand, the traits of the Smarter Society have not yet been harmonised. In this essay, the qualities of a smart army civilization are outlined using a methodology similar to those of a smart city. Due to its special responsibilities and structure, a brand-new trait known as "Smart Defense" has been added. It comprises four parts: interoperability, intelligence, weapon systems, and judgement cycles. A detailed examination resulted to the development of seven characteristics and 26 elements that may be used to evaluate and evaluate the defence forces and determine whether they qualify as a "Smart Military Society." This technique is known as the Smart Army technique. As ICT develops and lays the groundwork for the development of advanced technologies, the arrival of the "Smart Society" is anticipated to improve humankind's quality of life and increase productivity.

III. PROPOSED ALGORITHM

The project is designed to detect an injured soldier by monitoring their jacket using copper wires.

- The injured soldier wears a specially designed jacket that contains copper wires woven throughout the fabric.The wire is placed in a zigzag pattern in the inner layer of the jacket. This wire acts as a sensor and is responsible for detecting any damage to the jacket.
- When the soldier is injured, the copper wires in the jacket break due to the physical impact of the injury.
- This breakage of the copper wires is detected by an electronic circuit, which triggers a signal to be sent to a microcontroller.
- The microcontroller processes the signal and activates a GSM module, which sends a message to the leader's mobile phone or another device.
- The GSM module also communicates with a GPS module to obtain the location of the injured soldier.
- The location data is then included in the message sent to the leader, allowing them to quickly locate and provide assistance to the injured soldier.

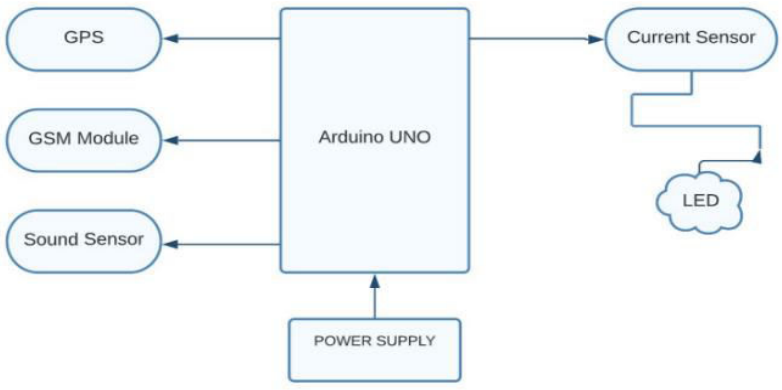

Fig 4. Block diagram

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 4, April 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1104075 |

The first step is to prepare the necessary materials and equipment for the project, including an ESP32 microcontroller, GSM and GPS modules, copper wire, and a jacket.
The second step is to design the circuit that will detect the breakage of copper wire in the jacket. This can be done using a simple voltage divider circuit, with the copper wire acting as one of the resistors in the circuit.
Once the circuit design is complete, the next step is to build a prototype of the system, which involves wiring up the circuit on a breadboard and testing it to ensure that it is functioning correctly.
After the prototype is built and tested, the next step is to modify the jacket by attaching the copper wire in strategic locations to detect when the jacket is torn or damaged.
The next step is to integrate the different components of the system, including the microcontroller, GSM module, and GPS module. This involves connecting the different components together and writing the necessary code to enable communication between them.
Once the system is fully integrated, the next step is to test it to ensure that it is functioning correctly. This involves testing the circuit to ensure that it detects breaks in the copper wire, as well as testing the GSM and GPS modules to ensure that they are sending and receiving data correctly.
Once the system is fully tested and functioning correctly, it can be deployed in the field for use in detecting injured soldiers. When the copper wire in the jacket is broken due to injury, the system will send a message via GSM to alert the leader, along with the GPS coordinates of the injured soldier.
The final step is to monitor the system in the field to ensure that it continues to function correctly and that any issues are addressed promptly.

IV. CONCLUSION AND FUTURE WORK

In conclusion, the project of detecting the injured soldier via copper wire breakage in a jacket and sending the information to the leader via GSM and GPS without CPU usage is successfully implemented. The system is designed to be lightweight and wearable, which allows the soldier to move freely without any hindrance. The system provides real-time information about the location and condition of the injured soldier, which can help the leader to take quick actions and provide necessary medical assistance.The system can be further improved by adding additional sensors to monitor the soldier's vital signs, such as heart rate, blood pressure, and body temperature. These sensors can provide more accurate information about the soldier's condition and help the leader to make more informed decisions.

Furthermore, the system can be used in various other applications, such as monitoring workers in hazardous environments, tracking children in crowded places, and providing real-time information about the location and condition of patients in hospitals.

REFERENCES

1. AritraBaksi, Mayookh Bhattacharjee, Siddhanta Ghosh, Soham Kanthi Bishnu, Arindam Chakraborty, “Internet of Things (IOT) Based Ambulance Tracking System Using GPS and GSM Modules”, IEEE-2020
2. Archana Padikar A et al “Health Monitoring and Soldier Tracking System using IOT”
3. Palash. S. Gajbhiye “Online Event Location Tracking Using GPS”, IRJET- 03 | Mar 2019, e-ISSN: 2395-0056
4. Prof. A.B.Wani, Bhagwan Pawar, Ashish Deshpande, Tushar Kaul, “BORDER SECURITY USING COMPUTER VISION”, IRJET- 03| Mar 2019
5. AashayGondaliaa , Dhruv Dixitb , Shubham Parasharc , VijayanandRaghavad , AnimeshSenguptae “IoT-based Healthcare Monitoring System for War Soldiers using Machine Learning” International Conference on Robotics and Smart Manufacturing (RoSMa2018)
6. Shubhangi Gupta1 , Shivani Kulshrestha2 , Divya Singh3 , Ashish Kumar4 , Er.Hitendra Singh5 “GPS and GSM Based Soldier Health Monitoring and Tracking System” JAREEIE-2017.
7. ArwinDatumayaWahyudiSumari, “Smart Military Society: Defining the characteristics to score the “Smart” of the Military Services”-Asymmetric Warfare Study Program, IEEE- 2015

INNO SPACE
SJIF Scientific Journal Impact Factor

Impact Factor: 8.379

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details