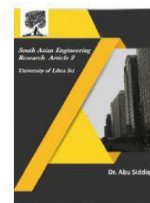




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## SOLDIER HEALTH AND POSITION TRACKING SYSTEM

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### ABSTRACT

The Soldier health and position tracking system is a cutting -edge technology designed to address the challenges of monitoring military personnel in unpredictable environments. It combines advanced wearable devices, GPS, and health sensors to provide real - time data on soldiers' health and locations. These wearables track vital signs like heart rate and body temperature, while GPS ensures precise location tracking. The data is sent to a central system where analytics and machine learning detect health issues and guide timely medical responses. SHRYS enhances situational for commanders, optimizes resource use, and ensures the well-being and effectiveness of soldiers in high-risk situations.

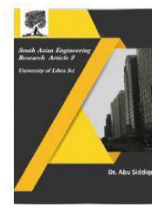
### INTRODUCTION

Warriors are the Army's most imperative asset. Warriors assume an important part to make sure one's nation. The term warriors incorporate administration men and ladies from the military, Air Force, Navy, and Marine. While giving security to the country, they could challenge inconveniences in hot/frosty climate conditions. Both exceptionally hot and icy temperatures might be unsafe for well-being. Normally they use woolen sweaters in winter and in summer they don't have another choice they must wear the uniform. So to avoid the

problem we are implementing the proposed method. The armed forces of tomorrow swear to the newest technology in the modern world which we have ever observed. The Military Services are fastly moving and approaching new inventions with more development now-a-days. The most crucial and necessary character is played mostly by the army forces in war. Soldier physical health is one of the most important one because they are the protectors who protect our country from enemies. Many things are there to do in



2581-4575



order to safeguard our soldier life. Knowing the exact spot of the soldier where he is and also the physical movement of them is very important for the base station to secure them. This project, we have arised with an idea of following the exact spot of the army member and also the physical health condition of the soldier in between the fight, which will entitle the persons in the base station to design the war plan accordingly. So, our paper here fully focuses on tracking and following the exact spot of the army members with the help of GPS, which is meant to be very useful for the base camp to know the correct spot of the army member where he is.. In the proposed method, our system integrates essential health monitoring components, including heart rate and temperature sensors, along with a pressure sensor, interfaced with a Raspberry Pi controller. The temperature sensor accurately gauges the body temperature, providing valuable health insights. Simultaneously, the heart rate sensor captures vital information about the user's cardiovascular activity. The data collected by these sensors is processed by the Raspberry Pi controller, which acts as the central hub for health monitoring. Once the temperature and heart rate values are determined, the system employs GPS technology to

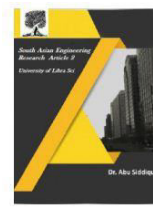
acquire the precise location information. This location data is then transmitted through a GSM module, enabling the Raspberry Pi to send real-time alerts or updates to a pre-defined contact number. In case of an abnormal temperature or heart rate reading, the system not only relays the health metrics but also communicates the exact location of the individual, ensuring prompt and targeted response measures. This integrated approach, utilizing sensors and communication modules, enhances the potential for rapid health interventions and location-based assistance, contributing to the overall effectiveness of the health monitoring system.

**"IOT BASED HEALTH AND POSITION TRACKING SYSTEM FOR SOLDIER SECURITY SYSTEM" rajitha m, s. madhav rao 1. vol 13,issue 06, june, 2022, issue no: 0377-9254**

In today's security landscape, safeguarding military personnel is paramount. To enhance the security and well-being of soldiers, a range of devices are deployed, including health sensors like pulse rate and body temperature monitors, GPS technology for precise location tracking, and GSM modules for rapid data transmission. This amalgamation of technologies



2581-4575



forms a cost-effective and reliable Soldier Health and Position Tracking System. This system continuously relays a soldier's GPS location and health status, including body temperature, to a military base unit. It also incorporates features like a soldier alertness program for activity monitoring and an emergency switch for immediate assistance. Overall, this system is a critical tool for ensuring soldier safety and providing timely support during missions. In the real of national security, military soldiers play a pivotal role, and ensuring their safety and effectiveness is of utmost importance. As warfare and missions become more technologically advanced, there is a growing need for cutting-edge equipment and systems. Initiatives like the United States' Future Force Warrior (FFW) and the United Kingdom's Future Infantry Soldier Technology (FIST) aim to revolutionize combat strategies. These systems include helmet-mounted displays for maps and video sharing, physiological sensors for health monitoring, and wireless communication capabilities. However, one key challenge is establishing lightweight systems for effective communication between soldiers and with the base station. Accurate soldier positioning is also

crucial for mission planning. To bolster national defense, we introduce the "Soldier Health Monitoring and Position Tracking System," which enhances soldier safety, communication, and situational awareness.

**Teja, Krishna, et al. "Smart Soldier Health Monitoring System Incorporating Embedded Electronics." *Advances in VLSI and Embedded Systems*. Springer, Singapore, 2021. 223-23**

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2581-4575



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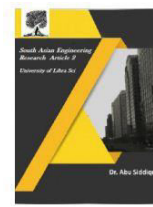
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**Jethwa, Bhargav, et al. "Realtime soldier's health monitoring system incorporating low power LoRa communication." *International Journal of Sensor Networks* 35.4 (2021): 221- 229.**

A country's military might is determined by its ability to field men on land, at sea,



2581-4575



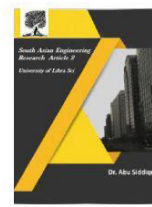
and in the air. A compact and effective approach is suggested for monitoring these soldiers. The soldier can mount this device, which keeps track of the soldier's whereabouts and health indicators. The strength of a nation is derived from its military might, which consists of land troops, air forces, and naval forces. To maintain tabs on these soldiers, a quick and efficient method is offered. This gadget, which the soldier can mount, monitors the soldier's health indicators and whereabouts. A few other parts of this system are beneficial to warriors. Low-data-rate, long-distance signal transmission from the soldier to the control device is made possible by

Long Range (LoRa) technology. We can design a system that uses less power while still transmitting at a high pace with the aid of LoRa. The health monitoring system consists of heart rate, pulse, temperature, and motion detection. Determine a soldier's level of fatigue in a battle situation with the use of motion detection. The soldier's chance of survival is increased by the ability of these gadget combinations to track the soldier in the field and their parameters. Motion detection assists in determining a soldier's level of weariness in a combat situation. In the current global environment, a nation's security is of the

utmost importance, and that security is dependent on the army force. It would be practically impossible to safeguard a country without the army. The creation of wearable technology is necessary because it is not large and uses very little power in the defense industry, allowing for the real-time tracking of a soldier's position and key health indicators while he is engaged in combat. The base station may direct the soldier to their location using this navigation system for soldiers. Hence, this paper focuses on monitoring the location of soldiers using GPS, which is important for control room stations to know the precise location of soldiers and accordingly they switch lead them. Moreover, high-speed, short-range wireless connection between soldiers is used to transmit data on situational awareness, including information from biological sensors, GPS, and wireless communication. Temperature and heartbeat sensors make up the biosensor. This project's key selling point is that it is Internet of Things (IoT) based. IoT systems are made up of connected machinery (mechanical or digital), computer tools, living things, humans, and other things with special functions. Their data may be moved through a network using the IoT without the



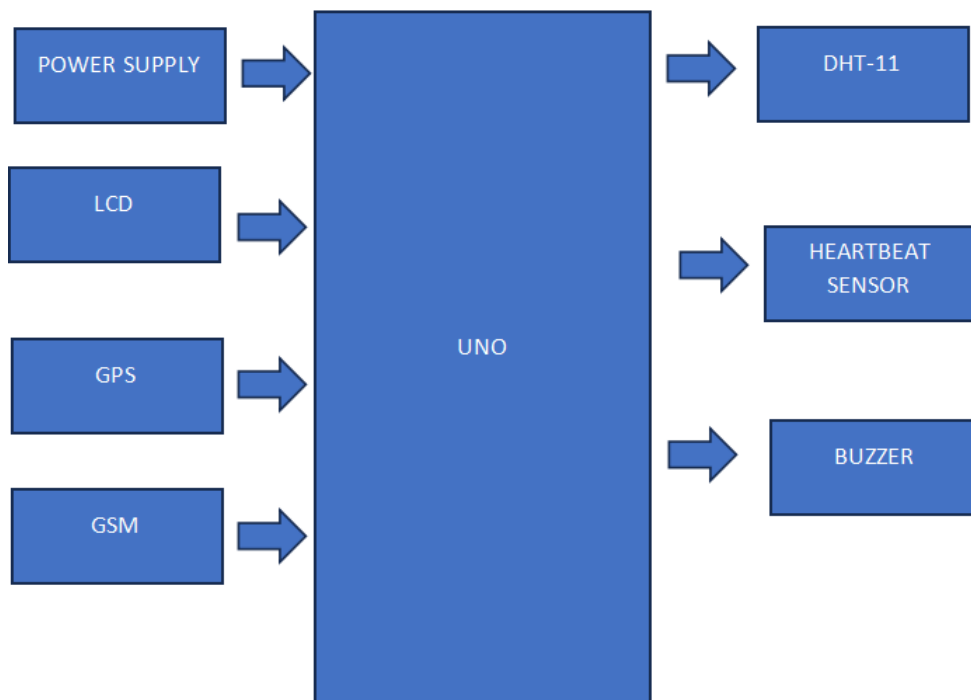
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involvement of human beings or computers from one location to another. The use of IoT in soldier navigation and health monitoring systems is in the immediate transmission to the base

station, without the need for the soldier to input any data, of the soldier's position and health parameters in real time while they are on the battlefield.

### Block diagram



### III. PROPOSED SYSTEM

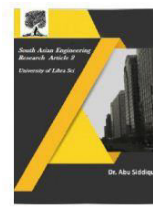
The **Soldier Health and Position Tracking System** is designed to enhance the safety and well-being of soldiers on the battlefield by continuously monitoring their vital signs and geographical location in real-time. This system integrates a combination of sensors, GPS modules, and communication technologies to ensure that commanders and medical personnel can monitor soldiers' health status and location from a remote control center.

#### 1. Health Monitoring Sensors:

The system is equipped with wearable sensors attached to the soldier's body to monitor vital health parameters such as heart rate, body temperature, blood pressure, and oxygen levels. These sensors are lightweight and non-intrusive, ensuring comfort while capturing accurate, real-time health data. In the case of abnormal readings or a sudden health deterioration, the system triggers an alert, allowing for immediate medical intervention.



2581-4575



## 2. GPS-Based Position Tracking:

A GPS module is integrated into the system to track the soldier's position in real-time. The GPS data is transmitted to the central command unit, providing an exact location of the soldier. This is crucial for monitoring the soldier's movement on the battlefield and for rescue missions if a soldier becomes immobile or lost.

## 3. Communication Module:

The system uses a secure wireless communication network, such as GSM, 4G/5G, or satellite communication, to transmit health data and GPS coordinates to a central monitoring system. The communication module ensures continuous data transmission, even in remote or challenging environments. It also enables two-way communication between soldiers and the command center for real-time updates and assistance.

## 4. Central Command Monitoring:

At the command center, an integrated system receives, processes, and displays the data from the soldiers in the field. The command team can view the real-time health status and location of all deployed soldiers through a user-friendly interface. In the event of any health issues or emergency situations, the command center can quickly identify the soldier's condition and position, enabling immediate response or medical evacuation.

## 5. Emergency Alerts and Notifications:

In case of any abnormal health readings (such as an elevated heart rate or drop in oxygen levels) or critical situations (like

injury or immobilization), the system automatically generates emergency alerts. These alerts are sent to both the central command and nearby medical units to ensure rapid response. The system can also log health and location data for future analysis or mission planning.

## 6. Battery and Power Management:

The system includes efficient power management solutions to ensure long-lasting performance in the field. Wearable devices and GPS units are equipped with long-life batteries that can sustain operation over extended missions. The system is also designed to be energy-efficient, with low-power communication protocols to prolong battery life.

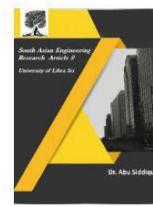
## 7. Data Encryption and Security:

The communication between the soldier's wearable system and the command center is encrypted to ensure the confidentiality and security of the data. This is critical to prevent any unauthorized interception of sensitive information, such as soldier locations and health conditions, ensuring that the system remains secure even in hostile environments.

This **Soldier Health and Position Tracking System** offers a comprehensive solution to safeguard soldiers during missions, providing commanders with real-time insights into their team's health and location. It enhances the effectiveness of field operations by enabling rapid medical intervention, improving the overall safety and situational awareness on the battlefield.



2581-4575



#### IV.CONCLUSION

The proposed method introduces a cost-effective and user-friendly solution for regulating the body temperature of soldiers in various environmental conditions. By incorporating innovative warming and cooling mechanisms, this approach ensures adaptability to diverse temperature scenarios. The system's simplicity in operation makes it accessible to soldiers in the field, promoting ease of use and practicality. Its cost-effectiveness stems from efficient technology integration and the utilization of readily available resources. The method prioritizes the wellbeing of soldiers by facilitating both warming and cooling processes, thereby enhancing their comfort and performance. Its flexibility allows seamless application across different temperature ranges, addressing the dynamic nature of military operations. In conclusion, the proposed method stands as an efficient and economical solution to regulate soldiers' body temperatures, contributing to their overall health and operational effectiveness in diverse climates.

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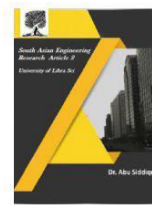
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2581-4575



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