



**Journal on Electronic and Automation Engineering**

**Vol: 2(1), March 2023**

**REST Publisher; ISSN: 2583-6951 (Online)**

**Website: <https://restpublisher.com/journals/jeae/>**

**DOI: <https://doi.org/10.46632/jeae/2/1/9>**



## **Solider Health and Position Tracking System**

**\*S. Sreeja, N. Krishna Chetan, K. Sandhya, N. Manohari**

*Jyothishmathi Institute of Technology and Science, Karimnagar, Telangana, India.*

\*Corresponding Author Email: [sreejasingathi@gmail.com](mailto:sreejasingathi@gmail.com)

**Abstract:** *In today's world, warfare is an important factor in any nation's security. One of the important and vital roles is played by the army soldiers. There are many concerns regarding the safety of soldiers. So for their security purpose, many instruments are mounted on them to view their health status as well as their real time location. Bio-sensor systems comprise various types of small physiological sensor transmission modules and processing capabilities, and can thus facilitate low-cost wearable unobtrusive solutions for health monitoring. This system gives an ability to track the location and monitor health of the soldiers in real time who become lost and get injured in the battlefield. It helps to minimise the time, search and rescue operation efforts of army control unit. This system enables to army control unit to track the location and monitor health of soldiers using GPS module and wireless body area sensor networks (WBASNs), such as temperature sensor, heart beat sensor, etc. The data coming from sensors and GPS receiver will be transmitted Wireless using ZigBee module among the fellow soldiers. Further, Wi-Fi network infrastructure has been proposed to be used between the squadron leader and the control unit in high altitude war zones where cellular network coverage is either absent or does not allow data transmission. The collected data will be uploaded on the cloud for further data analysis and predictions using algorithm.*

### **1. INTRODUCTION**

The trooper must be coordinated with cutting edge medicinal services observing, continuous GPS (Global Positioning System) and information interchanges to send and get data to/from the control unit. For that Soldier may require remote systems not exclusively to speak with control unit yet in addition with one next to the other military staff. Aside from the country's security, the warrior must need well being by ensuring himself with cutting edge weapons and it is fundamental for the military control unit to screen the well being status of the officer. To fill this need, in this paper bio therapeutic sensors and checking gadgets are incorporated with the officers. The incorporated parts must be light weight bundle and should give wanted outcome without requiring much power. One of the major difficulties in military activities lies that the officers are not ready to speak with control unit. What's more, the best possible route between fighters assumes a significant job for cautious arranging and co-appointment. Thus, the proposed work centers around following the area of fighter which is valuable for control room station to know the careful area of officer and as needs be they will direct them. Control unit gets area of warrior utilizing GPS. It is essential for the base station to direct the trooper on right way in the event that he lost in the war zone. This paper will be valuable for the fighters, who include in exceptional activities or missions. Shrewd Bio restorative sensors including Heartbeat sensor, Temperature and Humidity sensor, Vibration sensor, bomb identifier and so on., are appended to the coat of fighters. These are embedded with the trooper for complete portability. This framework will give availability to the server at the base station utilizing a remote association. The information gathered at the base station can be utilized for further forecast calculation. This may enable the control to station to think about the circumstance at the mission field.

### **2 .A REVIEW OF RELATED WORKS**

Health monitoring system designed to provide medical care and support to soldiers in military operations. The system consists of three components: a sensor network, a medical system, and a communication system. The sensors capture vital signs such as heart rate, body temperature, respiration rate, and electrocardiogram (ECG) signals. The medical system processes the data and alerts the medical personnel in case of any abnormalities. The communication system transmits the data to the medical personnel. The system is designed to be lightweight, portable, and robust so that it can be used in any environment. The paper also discusses the challenges in developing such a system, including the need for reliable sensors, robust communication, and secure data storage. Finally, the authors provide an evaluation of the system and the results[1].

Wireless Sensor Network (WSN) based approach to provide assistance to soldiers in battlefields. The proposed system is capable of detecting and tracking friendly soldiers in the battlefield and alerting them in case of any potential threats. It also provides navigation and communication between the soldiers in the battlefield. The system consists of a base station, sensor nodes and a mobile phone with embedded software. The data collected by the sensor nodes are sent to the base station which then analyses the data. The base station then sends the data to the mobile phone which displays the data to the soldier. The system also provides a two-way communication system between the soldier and the base station[2] GPS based soldier tracking and health indication system that utilizes a combination of global positioning system (GPS) and short-range wireless communication technology. The system has been designed to track the position of soldiers as well as measure their vital signs such as heart rate and respiration rate. The data is then transmitted to a ground station for monitoring. The system is designed to be used for location tracking and health monitoring of soldiers in extreme situations such as rescue missions or combat operations[3]. The development of technology has had a profound effect on modern society. One of the most significant changes has been the rise of digital media technologies, which have revolutionized the way people communicate, access information, and conduct business. This has led to a shift in the way people interact with each other and with media, and has increased the demand for new and innovative media-related services to meet the needs of a rapidly changing digital landscape. This literature review examines current research on digital media technology and its impact on society. It will focus on the effects of digital media technology on communication, knowledge sharing, and the economy, as well as the implications for future development and use of digital media technologies. Finally, this review will discuss the opportunities and challenges associated with digital media technology and its potential for transforming the way people interact with each other and with media.[5]

### 3. PROPOSED METHOD

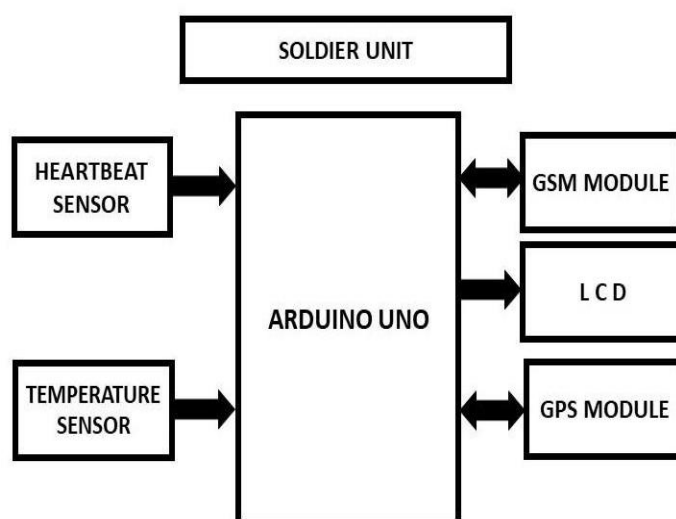


FIGURE 1. Circuit diagram

The main intention of this project is to find out the exact location of the injured soldier in the war field. This GSM based soldier health and position tracking system retrieves the exact location of a soldier in terms of its longitude and latitude. This data is fed to the Arduino, which is interfaced to a GSM modem. The Arduino retrieves the exact location details from the GPS and sends an SMS to the concerned authority over GSM modem. An LCD display is connected to the Arduino for crossing the data received before being sent over GSM. This project will be very useful to army base station to keep track of their soldiers. We used GPS to track the location of the soldier, Temperature Sensor (LM35) and Heartbeat Sensor (SEN11574) to monitor the health status of the soldier and GSM to bring communication between soldier and authorities. First power supply is given to Arduino then GPS and GSM modules will be initiated. The temperature sensor and heartbeat sensor measure temperature (in Celsius) and heartbeat (in BPM) of the soldier respectively. If temperature (t) exceeds 40 and heartbeat (t) is not in between 65 and 100 then GPS tracks the exact location of the soldier and sends an alert message to the authority by using GSM module.

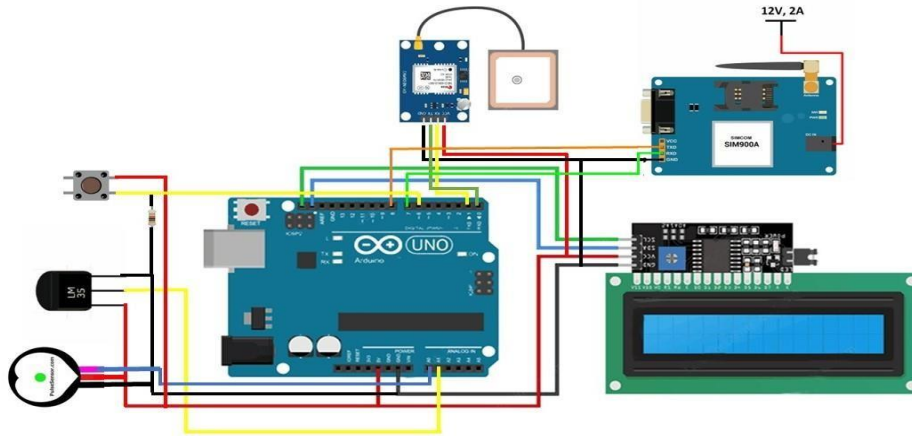


FIGURE 2. Circuit Diagram

### 4. RESULT ANALYSIS

output: A message is send on the registered number confirming about GSM and GPS configuration. Later as the body parameters (temperature and heartbeat) deviates from the given threshold values, an alert message is send to base station along with the precise location of the soldier. The health status of soldiers is shown in fig 3.



FIGURE 3. Output

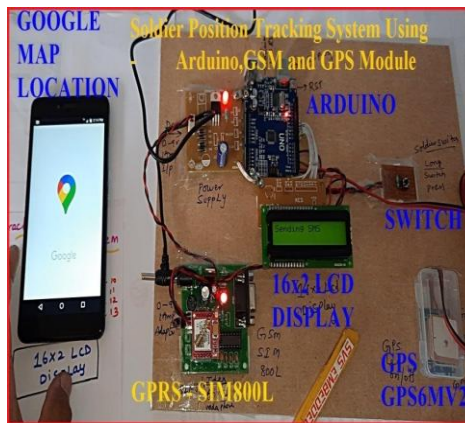


FIGURE 4. prototype

### 5. CONCLUSION

From the above implementation we have concluded that the communication hurdles between the soldiers and authorities at the base unit is overcome using GSM, the precise location and health parameters are known using GPS and wireless body area sensor network (WBASNs) respectively and with the GSM modem all information is send to the base station so that field commander will take necessary action. In order to bring real time solution for the problems being faced by soldiers in war filed, we can dial an emergency call by using advanced versions of GSM module, if the soldier health parameters crosses threshold value or soldier co-ordinates goes out of a certain / pre-decided track.

**Future Scope:** The scope of a Soldier Health and Position Tracking System could be expanded in the future to include more sophisticated tracking capabilities, such as real-time tracking of a soldier's vital signs, location, and activity. This would allow for a more comprehensive view of a soldier's health and performance in the field. Additionally, the system could be adapted to track the physiological and psychological health of the soldier, enabling commanders to better manage stress and fatigue levels. Further, the system could be used to provide early warning of potential health risks, allowing for proactive interventions to reduce the risk of injury or illness. Finally, the system could be used to develop personalized training and nutrition plans to optimize soldier performance, health, and wellbeing.

## REFERENCES

- [1]. Hock Beng Lim, Di Ma, Bang Wang, Zbigniew Kalbarczyk, Ravishankar K. Iyer, Kenneth L. Watkin (2010) "A Soldier Health Monitoring System for Military Applications" International Conference on Body Sensor Networks, pp: (246-249).
- [2]. M. Pranav Sailesh, C. Vimal Kumar, B. Cecil, B. M. Mangal Deep, P. Sivraj (2014) "Smart Soldier Assistance using WSN" International Conference on Embedded Systems - (ICES2014), IEEE, pp: (244-249).
- [3]. Umapathi N., Sabbani S. (2022) An Internet of Things (IoT)-based Approach for Real-Time Kitchen Monitoring Using NodeMCU 1.0. In: Sivasubramanian A., Shastry P.N., Hong P.C. (eds) Futuristic Communication and Network Technologies. Lecture Notes in Electrical Engineering, vol 792. Springer, Singapore. [https://doi.org/10.1007/978-981-16-4625-6\\_4](https://doi.org/10.1007/978-981-16-4625-6_4)
- [4]. Umapathi N., Sabbani S., Poovarasam S. (2022) Person Location Tracking Using Global Positioning System and ESP8266 with Internet of Things. In: Sivasubramanian A., Shastry P.N., Hong P.C. (eds) Futuristic Communication and Network Technologies. Lecture Notes in Electrical Engineering, vol 792. Springer, Singapore. [https://doi.org/10.1007/978-981-16-4625-6\\_21](https://doi.org/10.1007/978-981-16-4625-6_21)
- [5]. Shruti Nikam, Supriya Patil, Prajka Powar, V. S. Bendre (2013) "GPS Based Soldier Tracking and Health Indication System" International Journal of Advanced Research Electrical, Electronics and Instrumentation Engineering, 2(3), pp: (1082-1088).
- [6]. Soldier Health And Position Tracking System Using GSM Module and GPS Module. <https://www.youtube.com/watch?v=IrnUkbAwkVk&t=213s>
- [7]. N. Umapathi, C. Vyshnavi, K. Srilekha and V. Sahithi, "Monitoring of Crop Growth Parameters using Arduino and ESP8266," 2022 2nd International Conference on Emerging Frontiers in Electrical and Electronic Technologies (ICEFEET), 2022, pp. 1-5, doi: 10.1109/ICEFEET51821.2022.9848009.
- [8]. Army adopts new soldier health monitoring system. <https://www.dvidshub.net/news/179909/army-adopts-new-soldier-health-monitoring-system>
- [9]. Program uses GPS to track soldiers positions. [https://www.army.mil/article/103590/Program\\_uses\\_GPS\\_to\\_track\\_soldiers\\_positions/](https://www.army.mil/article/103590/Program_uses_GPS_to_track_soldiers_positions/)
- [10].N. Umapathi, S. Teja, Roshini and S. Kiran, "Design and Implementation of Prevent Gas Poisoning from Sewage Workers using Arduino," 2020 IEEE International Symposium on Sustainable Energy, Signal Processing and Cyber Security (iSSSC), 2020, pp. 1-4, doi:10.1109/iSSSC50941.2020.9358841.
- [11].N. Umapathi, C. Vyshnavi, K. Srilekha and V. Sahithi, "Monitoring of Crop Growth Parameters using Arduino and ESP8266," 2022 2nd International Conference on Emerging Frontiers in Electrical and Electronic Technologies (ICEFEET), 2022, pp. 1-5, doi: 10.1109/ICEFEET51821.2022.9848009.