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Soldier Health & Position Tracking System

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ABSTRACT: Soldier Health & Position Tracking System (SHPTS) is a real-time monitoring and tracking solution designed to enhance the situational awareness and health management of soldiers in combat zones. The system integrates various sensors, such as GPS, heart rate monitors, and environmental sensors, to capture critical health and location data, which is then transmitted to a central server for analysis and visualization. SHPTS provides commanders with an accurate and comprehensive view of their soldiers' locations and health status, allowing for timely decision-making and resource allocation. The system also enables soldiers to monitor their own health and fitness, promoting self-care and improving their overall readiness. SHPTS has the potential to enhance the effectiveness and safety of military operations while reducing the risk of casualties and injuries

KEYWORDS: Arduino UNO, Heartbeat Sensor, Temperature Sensor (LM35), Accelerometer (ADXL335), Inductive proximity sensor, GPS Module, WIFI Module, GSM Module, LCD Display (16*2), Push Button, LDR sensor, Battery, Buzzer

I. INTRODUCTION

The security of soldiers is a crucial consideration, especially in high-risk situations such as warfare or secret missions. Many countries, including the United States and the United Kingdom, are currently developing advanced soldier technologies such as the Future Force Warrior (FFW) and the Future Infantry Soldier Technology (FIST) to enhance combat effectiveness. These technologies include helmet-mounted displays capable of displaying maps and video from other team members, as well as various physiological sensors to monitor health parameters. They are also designed to improve situational awareness not only for soldiers in the field, but also for personnel at base stations through wireless communication. However, one of the major challenges is to create a lightweight system that is capable of delivering the desired results. Another challenge is ensuring effective communication between soldiers and the base station, as well as accurate navigation for proper planning. It is crucial for a country's defence department to be effective in ensuring the security of the country and its soldiers. To address these challenges, a "Soldier Health & Position Tracking System" is being introduced.

II. RELATED WORK

1. A Soldier Health Monitoring System For Military Application, With recent advances in technology, various wearable sensors have been developed for the monitoring of human physiological parameters. A Body Sensor Network (BSN) consisting of such physiological and biomedical sensor nodes placed on, near or within a human body can be used for real-time health monitoring. In this paper, we describe an on-going effort to develop a system consisting of interconnected BSNs for real-time health monitoring of soldiers
2. Real Time Health Monitoring, System Of Remote Patient Using ARM7 Smart Soldier Assistance Using WSM, Using this technology of Internet of Things for the proposed system. IoT is simply the network of interconnected things/devices, which is embedded with sensors, software, network connectivity and necessary electronics that enables them to collect & exchange data making them responsive. Using IoT, the place of the soldier can be transferred from one place to another over the network..

III.METHODOLOGY

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.

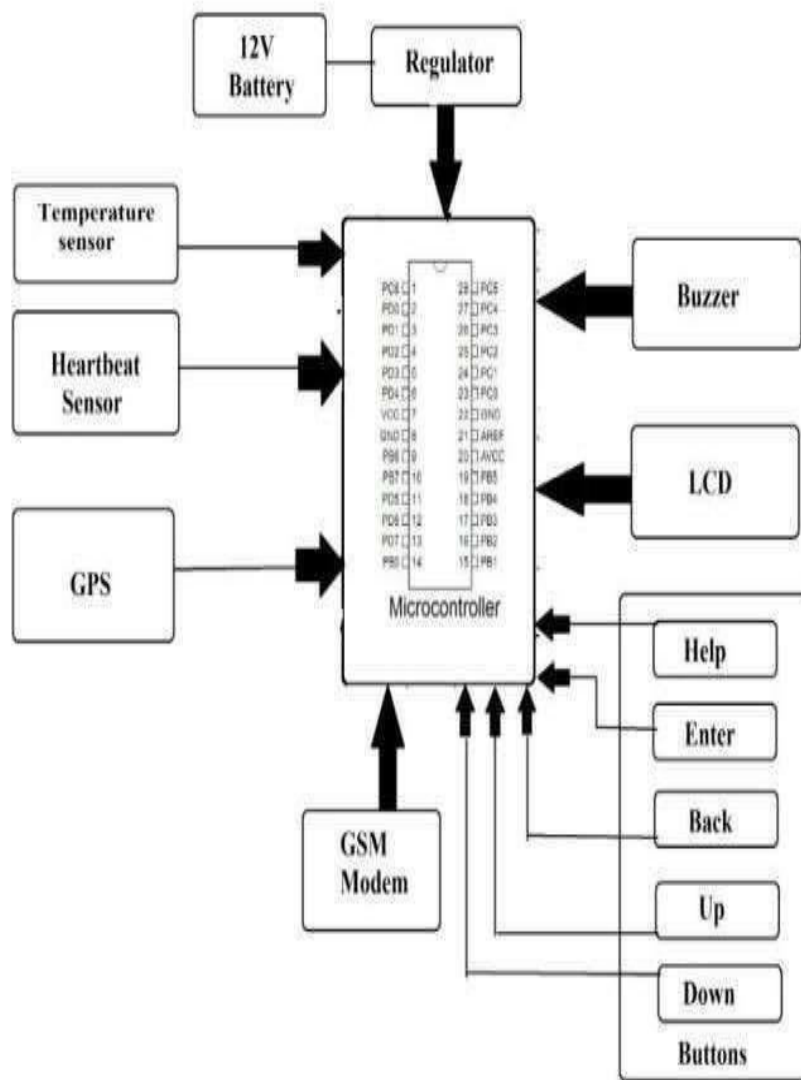


Fig 1: Block Diagram of System

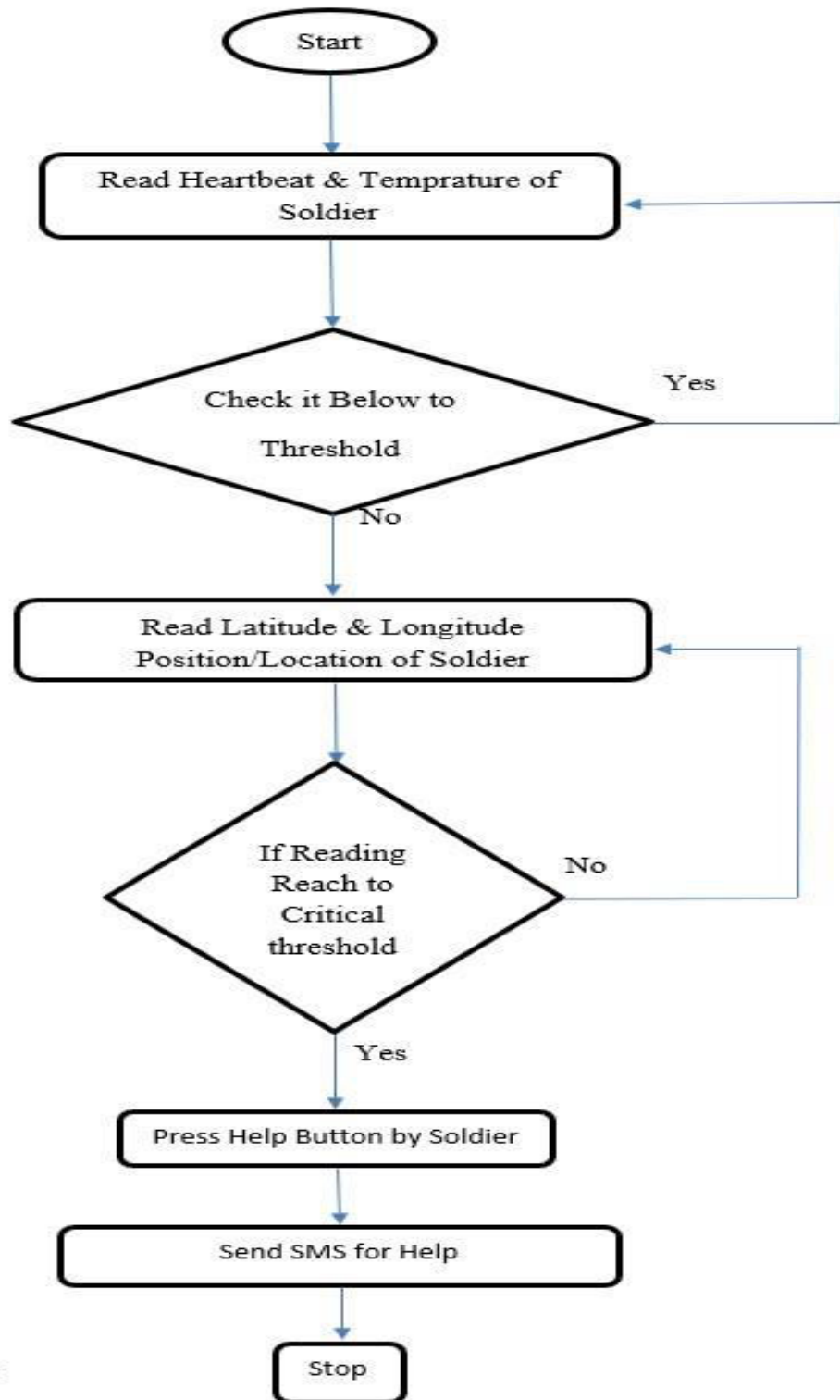


Fig 2: Flowchart of System

SOFTWARE REQUIREMENT –

- Arduino IDE
- Visual Studio

- **Arduino UNO:**

Arduino Uno is a microcontroller board created by Arduino.cc which is an open-source hardware stage predominantly dependent on AVR microcontroller Atmega328. The Arduino Uno accompanies USB interface, 6 simple information pins, 14 I/O computerized ports that are utilized to associate with outer electronic circuits. Out of 14 I/O ports, 6 pins can be utilized for PWM output. It enables the architects to control and detect the outer electronic gadgets in reality. This board accompanies every one of the highlights required to run the controller and can be straightforwardly associated with the PC through USB link that is utilized to exchange the code to the controller utilizing IDE (Integrated Development Environment) programming, basically created to program Arduino. IDE is similarly good with Windows, MAC or Linux Systems; in any case, Windows is desirable over use. Programming dialects like C and C++ are utilized in IDE. Apart from USB, battery or AC to DC adpoter can likewise be utilized to control the board.

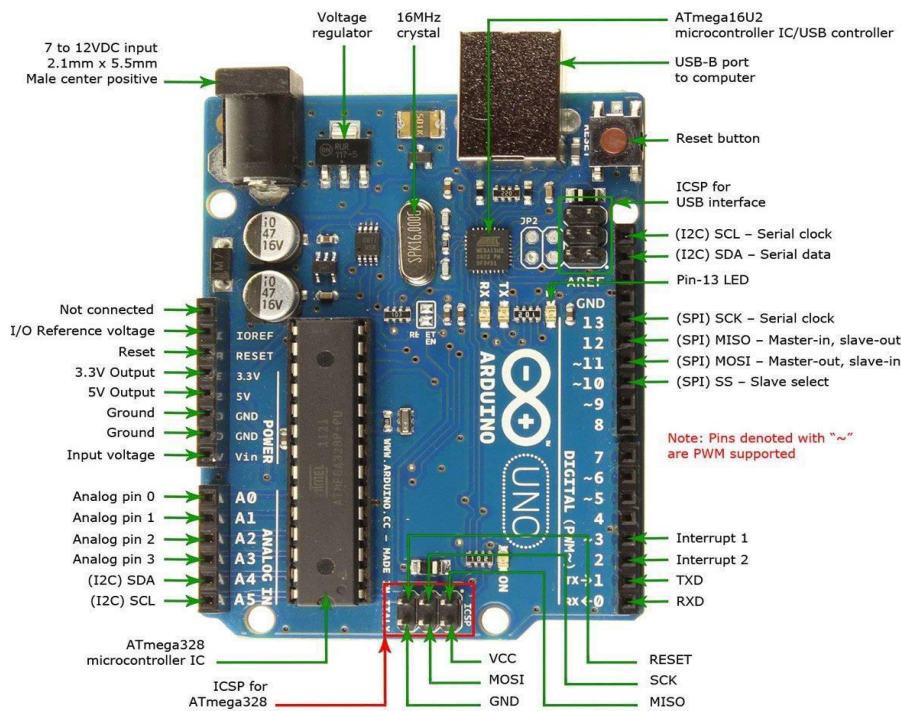
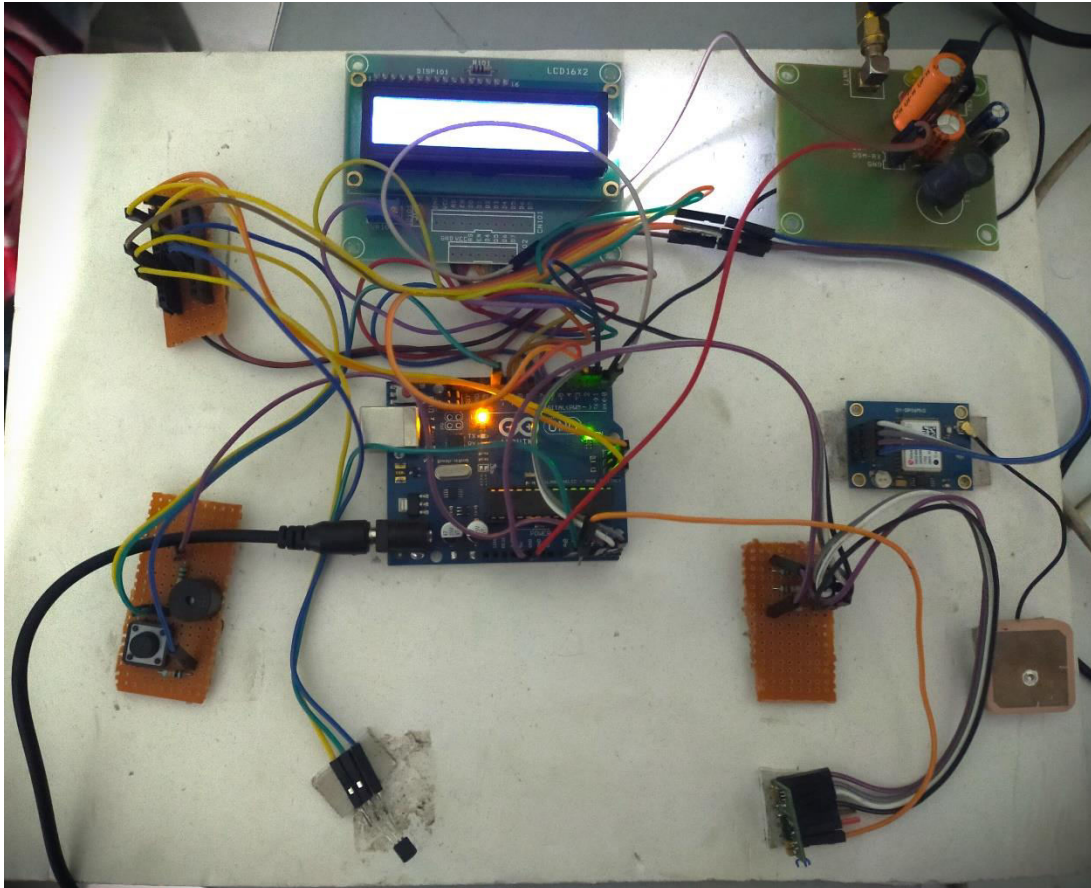


Fig 3:Arduino Uno

III. EXPERIMENT RESULT



IV. CONCLUSION

The Soldier Health & Position Tracking System (SHPTS) is a powerful tool designed to enhance the situational awareness and health management of soldiers in combat zones. The system integrates various sensors and advanced software applications to provide real-time tracking and monitoring of soldiers' location and health status. SHPTS not only enables commanders to make timely and informed decisions, but also allows soldiers to monitor their own health and fitness, promoting self-care and improving overall readiness. With its comprehensive features and strong data security measures, SHPTS has the potential to revolutionize military operations and ensure the safety and effectiveness of soldiers in the field. Overall, the development and implementation of SHPTS marks a significant advancement in the field of military technology and underscores the importance of innovation in improving the lives of those who serve.

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