



SOLDIER TRACKING & HEALTH MONITORING SYSTEM

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Abstract-

The soldier tracking and health monitoring system is a tool used to monitor the wellbeing and physical activity of soldiers while they are on duty. The system gathers information on the soldier's movements and vital signs, such as heart rate and respiratory rate, using wearable technology and sensors. The information is then examined to spot any potential illnesses or injuries and to provide the soldier feedback on their physical performance. The device also has a communication component that enables soldiers and medical personnel to communicate and be monitored in real-time. The system's overarching objective is to boost the general performance of soldiers while also enhancing their health and general well-being when they are out in the field.

Keywords:- soldier tracking, health monitoring, wearable devices, sensors, physical activity, vital signs, health issues, injuries, physical performance, communication, field.

INTRODUCTION

An innovation in technology called the troop tracking and health monitoring system was created to enhance the health and wellbeing of soldiers deployed. Soldiers use the system, which consists of wearable gadgets and sensors, to monitor their physical activity and vital indications including heart rate and respiration rate. The system's data is analysed to find any potential health problems or injuries and to give the soldier feedback on their physical performance. of the soldier. With the aid of the GSM

A variety of physical and psychological pressures that soldiers frequently encounter in the field can be harmful to their health and well-being. Long periods of physical exercise, exposure to harsh weather, and the possibility of injury or disease are some of these stressors. Traditional ways of keeping an eye on troops' health, such routine medical exams, might not be enough to spot any illnesses or injuries in time. A troop tracking and health monitoring system can be quite helpful in this situation.

A number of advantages are provided to both troops and military organisations by the soldier tracking and health monitoring system. The device may monitor soldiers' physical activity and vital signs to detect potential health problems or injuries early on and deliver prompt remedies. This can lower the risk of field injuries and illnesses while also assisting in the prevention of chronic diseases like diabetes and cardiovascular disease.

The cost of the soldier life is quite crucial. The soldier could unintentionally end up in an enemy position during the conflict, therefore he might require directions to figure out where he is. Other than the battle field injuries, the soldier may also suffer from extreme environment condition and fall sick, in such scenario if care is provided then the life of the soldier would be preserved. When a soldier gets lost, he can use an android application that provides the soldier's longitude and latitude using GPS to send an emergency voice message alert to the control centre and ask for directions.

I. PROBLEM STATEMENT

The purpose of the system is to provide real-time continuous monitoring of health metrics and location tracking utilizing IOT and GSM and GPS. The soldier is assisted by the panic button, which sends an emergency message, and the voice alert, which he can use to contact the commanding officer and other soldiers. Depending on the message the control room takes the necessary steps to preserve the life of the soldier.

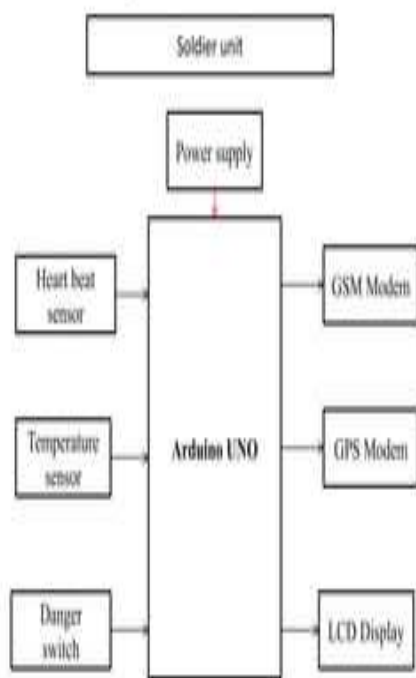
II. PROPOSED SYSTEM

The analysis software uses machine learning algorithms to analyze the data and identify any potential health issues or injuries. The software can also provide feedback to soldiers on their physical performance and suggest ways to improve their fitness levels. The communication component allows for real-time monitoring and communication between soldiers and healthcare professionals. This can help to ensure that soldiers receive timely interventions if they experience any health issues or injuries.

II. OVERVIEW OF THE SYSTEMS

This figure diagram is given below.

Block diagram:



A. SENSOR FOR MEASURING THE HEART BEAT



A tool used to gauge a person's heart rate is a heart rate sensor. The typical method of operation is the detection of the electrical impulses produced by the beating of the heart. The heart rate measurement obtained from these signals can either be displayed on the device or sent for analysis to another device.

There are several types of heart rate sensors available, including

- Devices that can be worn on the wrist, chest, or other parts of the body are known as wearable. They can be connected to a smart phone or other device to display heart rate information and are frequently used for fitness tracking.
- Pulse dosimeters: These instruments gauge both blood oxygen saturation levels and heart rate. They can be purchased for private usage as well as the frequent use in medical settings.

B. SENSOR FOR TEMPERATURE DETECTOR

A tool used to measure temperature is called a temperature sensor. Temperature sensors come in a variety of varieties, such as:

- Thermocouples are sensors made of two metal wires that are not identical to one another and are connected at one end. A voltage between the two wires is produced as the temperature varies, and this voltage may be measured to get the temperature.
- The resistance of a metal wire used in RTDs (Resistance Temperature Detectors) fluctuates with temperature. The temperature can be calculated using the resistance value.
- Thermostats are temperature-responsive materials that are used as sensors. The temperature can be calculated using the resistance value.
- Infrared sensors: These sensors determine an object's temperature by spotting the infrared radiation it emits.

C. GSM Mode

A form of communication mode utilized in mobile devices that use the Global System for Mobile Communications (GSM) network is referred to as GSM mode. The GSM mobile network standard is widely adopted throughout the world.

A mobile device can connect to a GSM cellular network and communicate with other GSM-enabled devices when it is operating in GSM mode. The gadget connects to the network using a SIM card, which houses the subscriber's data. For voice calls, text messages, and data transfer, GSM mode is frequently utilized.

D. GPS modem



A GPS modem is a gadget that combines a communication modem and a Global Positioning System (GPS) receiver. The communication modem is used to send the device's position information to a distant location, while the GPS receiver determines the device's location.

When real-time position data is required, such as when tracking automobiles, ships, or aero planes, GPS modems are frequently utilized. They can also be used for outdoor pleasure, animal monitoring, and asset tracking.

In order to communicate the location information, GPS modems often connect to a mobile network, such as a GSM or CDMA network. Some GPS modems can also connect to other networks, such as Wi-Fi or Bluetooth, in order to communicate.

E. LCD Unit

1. An LCD (liquid crystal display) device is a kind of electronic display that produces images and text using liquid crystals. A wide range of electronic gadgets, such as televisions, computer monitors, cell phones, and portable electronic devices, frequently employ LCD units.
2. A layer of liquid crystals is sandwiched between multiple layers of glass or plastic that make up LCD

displays. Different shades of color as well as black and white can be produced by manipulating the liquid crystals to block or let light through. A circuit board controls the LCD unit by sending commands to the liquid crystals, which then produce the desired image.

3. Wide viewing angles, high contrast ratios, and low power usage are all characteristics of LCD devices. In comparison to other display types, such as OLED (organic light-emitting diode) screens, they are also reasonably priced.
4. TFT (thin film transistor), FSTN (front-surface transistor), and STN (super twisted nematic) are a few of the different types of LCD units. Each variety has unique qualities and is appropriate for various uses.

FLOW CHART

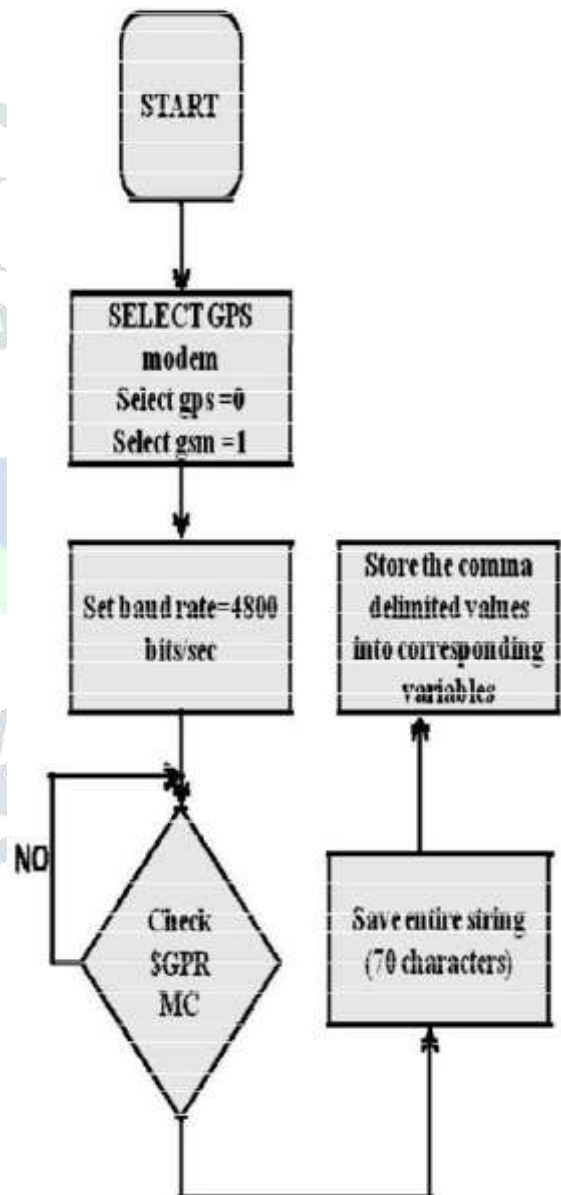


Fig 4: Flow chart of GPS

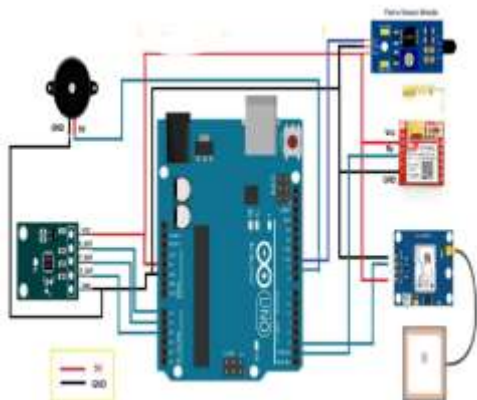
Using GPS and common web technology, the autonomous position detection and tracking system improves the precision of detecting friends' and family members' locations.

This system has a map service, a web client, a repository, and a mobile client. When a user's friends or SOLDIER are nearby, the mobile client uses location to determine their whereabouts and

sends them a Popup SMS.

SYSTEM ARCHITECTURE

1. The memory of the micro controller contains records of the soldier's typical body parameter rates. When it drops below a predetermined threshold, the control room receives a voice message alerting them to the situation. For instance, if an ECG sensor determines that a person's ECG is abnormal, it will notify the control room by voice message and LCD display that the person's ECG is abnormal five times in a row.
2. The heart beat sensor initially records the normal heart beat rate of that specific soldier and stores it in the memory of the controller. Every 2 seconds, the soldier's body rate is recorded, and if it is abnormal, it is reported. After receiving the alert, the appropriate steps can be followed to offer medical assistance when it is needed.
3. We have also incorporated a button known as the panic button so that a soldier can contact the command centre and other soldiers by pressing it in an emergency circumstance where the enemy is attacking or he feels lost.
4. which then broadcasts an EMERGENCY alert voice message to the pertinent control room or other soldier. Once the control room receives the Emergency notification they trace the location of the soldier and interact with them to provide the required support.
5. For the soldier's safety, a bomb detector is incorporated as an added feature.
6. If any mines are discovered while a soldier is moving, the buzzer warns the soldier and displays a message on the LCD display. It also sends a regular message to the commander. The command centre.
7. With the LM35 sensor mentioned in PART, we were able to obtain the heartbeat pulses displayed in ig.6, as well as the heartbeat counter and temperature measurement.



RESULT ANALYSIS

A soldier tracking and health monitoring system's findings could be as follows:

1. Enhanced situational awareness: The system can give commanders better situational awareness and allow them to make more informed decisions by tracking the whereabouts and activities of soldiers in real-time.
2. Increased safety: By keeping track of troops' health and warning authorities in case of an emergency, the system can contribute to their safety.
3. Enhanced efficiency: The technology can aid in enhancing efficiency and reducing the workload of soldiers and other employees by automating the tracking and monitoring process.
4. Better resource distribution: By tracking the whereabouts and requirements of soldiers in real-time, the system can assist in optimizing the distribution of resources including gear, ammunition, and medical supplies.

ACKNOWLEDGMENT

The people and organizations engaged in the system's conception, design, and implementation could receive recognition for their work on the tracking health monitoring system. This may include consumers who voluntarily participate in the system and offer feedback, as well as healthcare experts, researchers, engineers, and technicians who helped develop the system. Additionally, funding sources like public or private institutions that contributed money to the creation and maintenance of the system could be acknowledged. Recognition of a tracking health monitoring system would, in general, honor the efforts and contributions of everyone involved in realizing the system and enhancing people's health and wellbeing.

CONCLUSION

An evaluation of a tracking health monitoring system's success in achieving its goals, such as enhancing people's physical performance, lowering the risk of injury or illness, and improving overall health outcomes, could be used to determine the system's conclusion. This could be accomplished through the gathering and examination of information regarding system usage, as well as through user input and opinions.

The success of a tracking health monitoring system ultimately depends on its capacity to achieve its goals and enhance the health and well being of its users.

A technology breakthrough that has the potential to enhance the health and wellbeing of soldiers in the

field is the soldier tracking and health monitoring system. The system is made up of a number of parts, such as wearable gadgets and sensors, data analysis software, and a component for communication. Together, these elements measure soldiers' physical activity and vital signs and enable real-time observation and interaction between soldiers and medical personnel.

The soldier tracking and health monitoring system has many advantages. The technology can assist in preventing the development of chronic illnesses and lowering the risk of accident or illness in the field by detecting potential health problems or injuries early on. Additionally, the system can provide warriors advice on how to improve their fitness levels their physical performance.

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