



Smart Combat Uniform with Vital net Real-Time Health Monitoring and Position Tracking for Soldiers

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ABSTRACT: This project presents a smart combat uniform designed to monitor the health condition of soldiers in real time. It uses sensors to measure parameters such as heart rate, body temperature, and motion. The collected data is transmitted using IoT technology to a monitoring system. In case of abnormal conditions, alerts are generated automatically. This helps in quick medical response and improves safety. The system also includes GPS tracking for location monitoring.

KEYWORDS: combat,real time,sensors,heartrate,motion,IoT,alerts,GPS T

I. INTRODUCTION

Soldiers work in extreme and risky environments where continuous monitoring is important. Traditional systems do not provide real-time updates and rely on manual checking. This leads to delays in identifying health issues. With the advancement of IoT, wearable devices can continuously track vital parameters. This project introduces a smart uniform that integrates sensors and communication systems. It ensures timely detection and faster response during emergencies.

II. OBJECTIVES

The main objective is to continuously monitor the health condition of soldiers. It aims to provide real-time data transmission using wireless communication. Another goal is to generate automatic alerts during emergencies. The system also focuses on accurate temperature and heart rate monitoring. It includes location tracking using GPS technology. Overall, the objective is to improve safety and reduce response time.

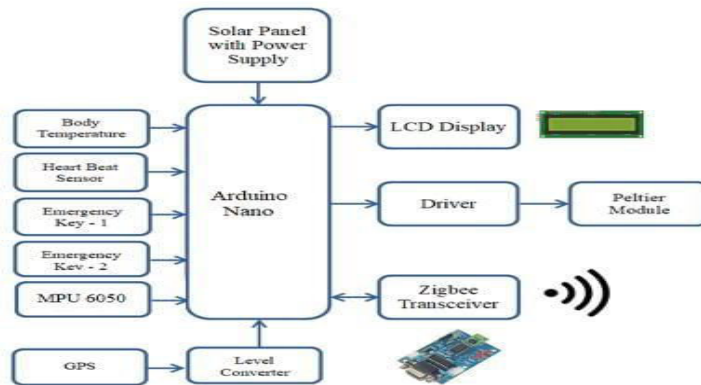
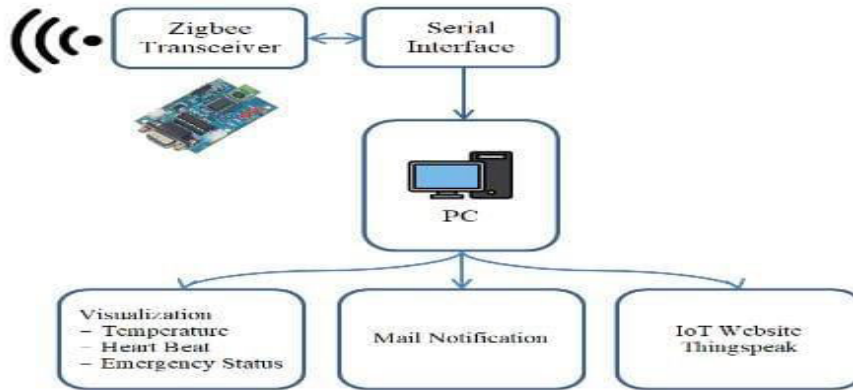
III. PROBLEM STATEMENT

In battlefield situations, soldiers may face sudden health issues or injuries. These conditions are often not detected immediately due to lack of monitoring systems. Existing systems do not provide continuous tracking of vital parameters. There is also a delay in communication during emergencies. This increases the risk to soldiers' lives. Hence, a real-time monitoring system is required.

IV. PROPOSED SYSTEM

The proposed system is a wearable smart device integrated into a combat uniform. It uses sensors to collect health data continuously. A NodeMCU microcontroller processes and transmits the data. GPS is used to track the exact location of the soldier. If abnormal conditions are detected, alerts are triggered automatically. This system improves response time and ensures better safety.

V. BLOCK DIAGRAM



VI. DESIGN AND SELECTION OF COMPONENTS

MICROCONTROLLER

The microcontroller is the brain of the system. It receives input from sensors and processes the data. It controls all operations of the device. It also manages communication between components. It ensures proper functioning of the system. It plays a key role in decision-making.

NODEMCU

NodeMCU is a Wi-Fi enabled microcontroller. It is used for wireless data transmission. It allows communication with remote monitoring systems. It is compact and energy efficient. It supports easy programming using Arduino IDE. It is widely used in IoT applications.

GPS

The GPS module is used for location tracking. It provides real-time coordinates of the soldier. It helps in identifying the exact position during emergencies. It works using satellite signals. It improves rescue operations. It is essential for outdoor monitoring.

TEMPERATURE SENSOR

The temperature sensor measures body temperature continuously. It detects abnormal temperature changes. It helps in identifying fever or hypothermia. It provides accurate readings. It sends data to the controller. It is important for health monitoring.



HEARTBEAT SENSOR

The heartbeat sensor measures heart rate. It detects irregular heart conditions. It provides real-time pulse data. It helps in identifying stress or fatigue. It is connected to the microcontroller. It plays a crucial role in monitoring.

MPU 6050

The MPU6050 is an accelerometer and gyroscope sensor. It detects motion and orientation. It helps in fall detection. It provides movement data. It is useful in tracking activity. It enhances system functionality.

PUSH BUTTON

The push button is used for manual alerts. It allows the soldier to send emergency signals. It is simple and easy to use. It provides quick response capability. It acts as a backup alert system. It improves safety.

BUZZER

The buzzer is used for alert indication. It produces sound during emergencies. It helps in immediate attention. It is controlled by the microcontroller. It is simple and effective. It enhances alert system.

LCD DISPLAY

The LCD displays real-time data. It shows parameters like temperature and heart rate. It provides visual feedback. It is easy to read. It consumes less power. It improves user interaction.

POWER SUPPLY

The power supply provides energy to the system. It ensures stable voltage. It protects components from damage. It is designed for efficiency. It supports continuous operation. It is essential for system reliability.

PC

The PC is used for monitoring and analysis. It receives data from the system. It displays and stores information. It helps in decision making. It allows remote access. It improves system usability.

SOFTWARE REQUIREMENTS

VII. RESULTS AND ANALYSIS

The system successfully monitored health parameters. Data was transmitted in real time. Alerts were generated during abnormal conditions. GPS provided accurate location. The system showed reliable performance. It improved response time.

VIII. CONCLUSION

The project provides an effective solution for soldier safety. It ensures continuous health monitoring. It reduces delay in emergency response. It integrates multiple technologies. It is reliable and efficient. It can be further improved with advanced features.

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