

TechWear

Supriya S. Patil

Samarth College of Engineering & Management, Belhe, India, Pune

Guide: Prof.S.R. Shegar

Abstract - The "Wear Tech" project presents the cutting-edge smart jacket designed for a military personnel. It offers advanced features including temperature control, navigation, water detection, phone loss notification, oxygen level monitoring, and emergency response capabilities. This innovative jacket prioritizes wearer well-being and operational efficiency in diverse climates. The "Wear Tech" project heralds a new era in military apparel with its revolutionary smart jacket, meticulously engineered to cater to the needs of modern military personnel. Seamlessly integrating cutting-edge technology with rugged functionality, this state-of-the-art garment redefines the standards of performance and comfort on the battlefield. At its core, the smart jacket embodies a fusion of advanced features designed to optimize wearer safety and operational effectiveness across diverse environmental conditions. From its sophisticated temperature control system ensuring optimal thermal regulation to its precise navigation capabilities facilitating seamless maneuvering in unfamiliar territories, every aspect of the jacket is meticulously crafted to empower the wearer. Moreover, its water detection mechanism provides a crucial layer of protection against unforeseen hazards, while the phone loss notification feature ensures that connectivity remains uninterrupted even in the midst of chaos. Additionally, the integration of oxygen level monitoring technology underscores a commitment to safeguarding the wearer's health in high-stakes situations. Perhaps most impressively, the jacket boasts emergency response capabilities, offering reassurance in times of crisis by swiftly summoning assistance when needed most. In essence, the "Wear Tech" smart jacket represents a paradigm shift in tradition to redefine the boundaries of possibility, ensuring that those who serve are equipped with nothing less than the best.

Key Words: Wear Tech, smart jacket, military personnel, temperature control, navigation, water detection, phone loss notification, oxygen level monitoring, emergency response, well-being, operational efficiency, diverse climates.

1. INTRODUCTION

Smart jackets are the new and innovative type of wearable technology that combine a functionality of traditional jacket with a power of embedded sensors and electronics. This allows smart jackets to perform a wide range of tasks, such as:

- **Providing safety and security features:** Smart jacket can also be equipped with Sensor to detect falls, impacts, or other hazards. This data can be used to trigger alarms or send alerts to the emergency services. In addition, smart jacket can be integrated with GPS and other technologies to provide location tracking and navigation capabilities. (a) **Monitoring and tracking health data:** Smart jacket can be equipped with sensors to track oxygen level, body temperature, and other vital signals. This data can be transmitted to the smart phone for real-time monitoring, stored on the jacket's internal memory storage for later analysis. (a)

signal This data can be transmitted to the smart phone for real time monitoring, store on jacket's internal memory storage for later analysis.(a)

- **Improving performance and comfort:** Smart jacket can also be used to improve athletic performance and comfort. For example, smart jacket can provide heating and cooling function to help users stay comfortable in extreme temperatures. Others can provide real-time feedback on posture, gait, and , other biometrics to help users improve their technique.(a)

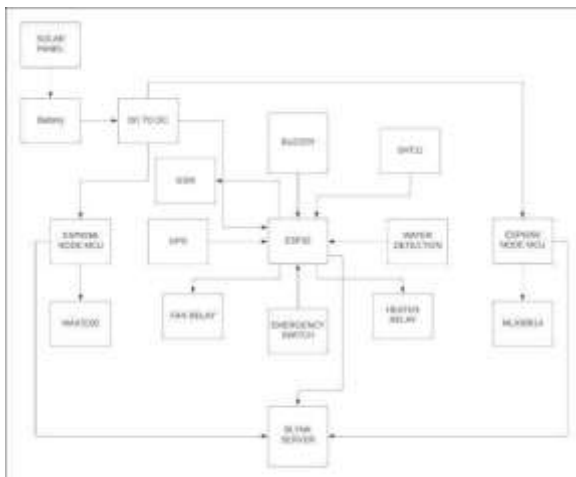


Fig.a) block diagram

2. Working: Smart jacket work by combining traditional jacket construction with embedded sensors and electronics. The sensors collect data about the wearer's body and environment, and the electronics process and transmit this data to other devices, such as smart phone.

We are using esp32 as a main controller. Most of the sensors like float sensor, emergency switch, gps, gsm, and dht11 temperature sensor are attached to esp32. As well as heating pads and fans are also attached to esp32. When dht11 temperature gets high, fans get on, and if temperature gets low, heating pads get on. Float sensor and emergency switch send emergency msg with respect to location and using gsm module as well as all sensor data is sent to blynk server. Gps data, temperature data from esp32. Esp8266 node mcu is also used. This is used to detect body temperature using mlx90614 sensor and its a infrared temperature sensor. It is used to send data of temperature to the blynk server. Another esp8266 is used to send data of max3100 sensor to blynk server. So 2 data all the esp are powered with 2 dc dc to step down

converter 12 v

to 5 volts and a main battery of 3 lithium iron cell is used 12 volts.(a)

Temp: Temp sensor is to measure temperature of body and then control the body temperature by using heater and fans.

ESP 32: The ESP32 is widely used in IoT (Internet of Things) applications due to its versatility, energy efficiency, and connectivity features. It has a dual-core processor, various digital and analog input/output pins, and support for a range of communication protocols, making it suitable for a wide range of projects, from simple sensor monitoring to complex automation systems.

GPS: GPS provides a user with positioning, navigation and a timing services.

GSM: A GSM module plays the crucial role in the communication between devices and a GSM network.

It is responsible for establishing and maintaining the communication link between a device and a network.

2CH RELAY: A 2 CHANNELS RELAY module

is a convenient board which can be used to control high voltage, a high current load such as motor, a solenoid Valves, lamps and the AC load.

FLOATING Sensor: Use to sense the water and then send the signal or message to assigned number.

MAX3100: The probe measures pulse – oxygen level and a temperature from a connected finger.

BLUETOOTH: All connections are connected to a Bluetooth module so that the jacket can be operated for phone application.

Hardware used:

Temp

SOLAR PANEL

BATTERY

DC TO DC

BUZZER

MLX90614

EMERGENCY SWITCH

ESP 32

GPS

BLYNK SENSOR

GSM

FAN AND HEATER EMER RELAY

FLOATING SENSOR

MAX3100
BLUETOOTH

SmartJacketDevelopment: Requirements of jacket:

Fitness tracking

Communicationandentertainment

Environmentalmonitoring

Temperaturecontroller

Posturecorrection

Falldetection

NavigationandPrivacyandsecurity

Advantages:

Convenience:Smartjacketcanprovideavarietyof convenient features, such as temperature control, navigation and communication.

Safety:Smartjacket can beequipped with sensors that can detect hazards such as falls and etc. This info can be used to alert the wearer of danger and prevent accidents from happening.

Health: Smart jacket can track the wearer's fitness metrics, such as pulse. This info can be used to improve the wearer health and fitness.

Productivity:Smartjacketcanhelpthe wearer to be more productive by providing them with access to info and tools on the go.(b)

Conclusion:

In this report, we discussed all aspects regarding

smartjacket, This will give all information about it, as

jacket development, working and advantages

References:

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