

Special Issue of First International Conference on Science, Technology & Management (ICSTM-2020) Soldiers health monitoring and tracking system using IOT and UAV

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Abstract

Abstract-For the past five years in Indian history there are totally 106 percent soldiers has lost their life during the terrorist attack so the checking of the soldiers health in a war and the observing during the terrorist attack are been so significant know a days. In the field of sensors the innovation has accumulated the tremendous development and numerous wearable body sensors (WBS) have been invented. In this paper we portray the system of WBS which will be mounted the soldiers jacket and the data from the WBS are been transmitted to the unmanned aerial vehicle (UAV) and for the explanation of strong communication the data are likewise been transmitted to the military truck. Furthermore, the data transmitted will be seen through the secured website in the receiver side so the communication between the transceiver will be the stronger one. The jacket consist of a body temperature & humidity sensor, heart beat pulse sensor, gas sensor, global positioning system (GPS) module and the medic space the outcome which appear in the web page where the precision are practically equivalent to the commercial device.

Keywords: WBS, UAV, Military Truck, IoT

1. Introduction

India has having the third largest armed force in the world but for the past five years the number of terrorist attack has been increased to 177 percent and total 106 percent soldiers has lost their life and a significant number of the soldiers also harmed during these incidents [1].Due to the unavailability of on-time soldiers health data the army is facing more trouble know a days. The soldier death due to the injuries is more than the direct assassination of a soldier. In recent years the advancement in health monitoring framework like LorRaWAN, RF transmitter, GSM, walkie-talkie based system where been implemented but buy using these technology the military has been suffered from some drawbacks like high implementation cost, weak communication, huge setup so by overcoming this problem the strong communication, costless and the portable wireless

based system for monitoring the soldiers health is been proposed in this paper. The paper is put together up with respect to building strong communication in IoT System. The system build up of temperature & humidity sensor, heart-beat sensor, gas sensor and the GPS for monitoring the soldier location in the war or attacks the jacket additionally contains the medic space also. This overall system will been controlled by an IoT based microcontroller and the data will been transmitted to the two web servers at the same time to provide the strong data communication and the data from the WBS are been seen through the secured web page so the soldier health condition will been updated continuously in the web page.

The section II of the paper is the literature survey. Section III is the methodology of the paper section IV of the paper is about technology and section V is reason behind the paper. Section VI is about the application and the section VII is about implementation of this paper and section VIII is the conclusion.



Fig.1. Block diagram

2. LITERATURE SURVEY

Aashay Gondaliaa et al. [2] portrait the system where the soldier's health data are been transmitted through the Zigbee and the LoRaWAN module in this squad leader will been carry with both Zigbee and the LoRaWAN the remaining squad member will be carrying the Zigbee alone .The data will be analyzed using k-means clustering algorithm. The author [3,4] proposed the system where soldier/Patient health is be directly monitored with the help of an IoT. Iyer. B et al. [3] uses nodemcu microcontroller to transmit data to the internet. Prof. Hemant Shinde et al. [5] proposed the "A Real Time Health Monitoring and Tracking of Soldiers using (IoT)" in which the health data will be collected through the raspberrypi/arduino controllers and it will cast to the internet. Dineshkumar Jaiswar et al. [6] proposed the "Real Time Tracking and Health Monitoring of Soldiers using Zigbee Technology: a Survey" where the author used Zigbee and nRF24L01 to transmit the heath data. I.F.Akyildiz et al. [7] describe about the various wearable, portable body sensor in which can be used to get the data from patient/soldiers body. The proposed system in this paper is been used to improve the satellite internet facilities to the current IoT system and to provide the unbreakable communication.

3. Methodology

The hardware components and materials that we used in the system are Nodemcu esp8266 wifi board (*2), DHT11, Heart rate detector (EC-0567), Gas sensor MQ135, GPS, UAV.

1) Nodemcu (Microcontroller)

The Nodemcu is the wifi enabled microcontroller where it is been widely used in the IoT areas It gets the input from the sensor and it will upload to the internet.

2) DHT11 (S1)

The DHT11 is the temperature & humidity measuring sensor where it is operating voltage is very low and it can be easily used in any place due to smaller of its size.

3) Heart rate detector (S2)

The heart rate detector is commonly known as pulse sensor where it is used to measure the pulse signal from the body. It's operating voltage and size is very low.

4) Gas sensor (S3)

The gas sensor MQ135 is the air quality measuring sensor where it is used to check the quality of the air in a surrounding.

5) GPS (S4)

GPS is the global positioning system where it is used find the accurate place of the person by using latitude & longitude.



Fig.2. Block diagram of control unit

4. Technology

The technology that we used behind this paper is the internet of things (IoT) since the IoT is the extensively upcoming technology in the ongoing Years. By using the IoT we can gather the data from various part of the world immediately. If there would be an occurrence monitoring soldiers

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we have to screen trooper's health from the various sectors of the countries so it is not possible use the technology like LoRaWAN or the RF transmitters because it can been operated only in small range .On account of IoT also we need the network access it is impractical to give the high speed satellite internet to the soldiers in the battle zone. So in this paper we resolve this problem with the help of UAV and the military trucks this is been consider as the two servers where the UAV will been fly over the battle field and the military truck will been placed little away from the battle field the data collected from the module 1 will been send to the server 1 which is UAV and the module 2 data will been collected by the military truck which is server 2 the reason for providing the two servers to produce the strong communication in case of if any one of the server is been collapsed the data can been displayed through the another server immediately.

5. Application

It is tough to provide the High speed satellite internet service for a soldier in the battle field to monitoring their health and on the off chance that it is conceivable also the transmission rate and the receiving rate won't been excessively acceptable because of the significant distance [8]. So this paper overcomes this problem by using the UAV where it is almost like the router technology. The UAV will been placed above the battle field it will act like server and video taker the data collated from the module 1 will been uploaded to the UAV so the long distance transmission can been solved. In case if there is any collapse in the UAV server the soldier also provide the back up as server 2 which is the military truck where the module 2 data will been uploaded to it so the data communication problem can been overcome.

6. Implementation

The monitoring of soldiers health had become increasingly significant now a days. Numerous innovations has been actualized but all of it suffers from problems like huge cost, noise and weak communication to overcome this problem we proposed a system with low cost, strong communication, easy to carry and the attached medics so the implementation will be the easier Volume 02 Issue 12S December 2020





Fig.3. Demo model

7. Purpose

There are totally 339 soldiers are been died in the terrorist attack between the past five years in this vast majority of the soldiers are been die through the injuries only .If the soldiers health are been monitored repeatedly and if the medic support is available the injured ones can be saved. In this paper we proposed the system monitoring of soldiers health through IoT and UAV it will been useful for monitoring the soldiers health repeatedly with the strong data transfer and the system also provided with jacket medic in case if the solider health becomes more worse due to gun shots the jacket medic will been provided with coagulants and various medicine it arrest the blood leakage so the soldiers life can been saved in the attack or warfare's

Conclusions

The paper report about monitoring solider health through IoT and UAV is tied in with monitoring the soldier's health in war or terrorist attacks. The overall system is been controlled by the IoT based system provide module the the strong communication between the transceiver. The overall implementation cost will be very low the data which is shown in the receiver side is almost equal to the commercial one. And there is a backup server if the server 1 is been collapsed the server 2 will screen the data and to monitored the location of the soldiers the GPS has been attached with the system. The paper concludes that if the system has been implemented in the country huge number of soldier lives can be saved in the war or terrorist attack.

Result



Fig.4. Output of the all the sensor from server 1 web page

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Variables						
Tokens						
1 series						
E Logs						
Integrations						
Points and Limits						

Fig.5. Overall view of an output getting from the server 2 web page

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