IOT BASED SOLDIER HEALTH MONITORING AND POSITION TRACKING SYSTEM USING GPS AND GSM

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Abstract:

The soldier Health and Position Tracking System allows military to track the current GPS position of soldier and also checks the health status including body temperature and heartbeats of soldier. The System also consists extra feature with the help of that soldier can ask for help manually or send a distress signal to military if he is in need. The GPS modem sends the latitude and longitude position with link pattern with the help of that military can track the current position of the soldier. The system is very helpful for getting health status information of soldier and providing them instant help. the security system of the nation depending upon the enemy's war and so the security of the soldiers is considered as an important role in it. Concerning the safety of the soldiers, there are numerous tools to observe the health condition of the soldiers .The proposed system uses GPS to track the direction of the soldier in the form of latitude and longitude values. So that direction can be found easily. The proposed system can be mounted on the soldier's body to track their health status and current location using GPS. These information will be transmitted to the control room through IoT. The proposed system comprise of tiny wearable physiological equipment's, sensors, transmission modules. Hence, with the use of the proposed equipment, it is possible to implement a low cost mechanism to protect the valuable human life on the battlefield. Designing of this system using GPS and GSM gives a wireless system for tracking the location of the soldier and observing the heart beat rate and body temperature of the soldier.

Keywords: SM, GPS, IOT, Health parameters.

INTRODUCTION

Everyone in this world wants to be safe and secure. When it comes to the

safety and security of Multinational companies, Military, Army, the situation becomes more complicated. Even a common man puts his maximum efforts to protect his data. The popular methods to protect the data in a secure way is to encrypt the data while sending and receiving , decrypt the data to retrieve the original message. Before transmitting the data, the data will be converted into an unreadable form and will be sent. At receiver side the opposite operation of encryption is carried out to recover back the original message. Thus the data will be protected in every way by following the encryption and decryption standard formats. Wireless makes this project more flexible. Some of the software are needed to be installed into the system before using them and hardwired connections. The hardware connections and cabling can be completely eliminated in this project. In the Military area secure communication is required. The information shared between them is very confidential. The message send or receive should not hacked. For the secure communication system a controller based wireless communication system is used for secure message and data transmission and reception. There

are two types of communication-Half duplex and full duplex. This project is based on secure/Encrypted half duplex system. The messages in this system cannot be hacked. In communication systems transmission of data from one place to another place is important. These helps in monitoring wide control systems as well as the management network. In top level managements some information and decisions are secret. Also, the secret data from one place to another should be sent without any interruptions. The country to county communication, the communication between the prime minister and the defense minister requires to be kept very secret. Various types of communication means are used for achieving this purpose. Some people use encryption and decryption methods i.e. some erratic data is added at the transmitter end and the mix signal is transmitted. At the receiver end the added signal is removed in order to get the original signal transmitter. If the signal is tapped and tried to decode it is not possible due to encryption. And thus, the protection against such a risk is provided. But this are the old methods used in previous types. Now a days, the decoding / encoding phenomenon's are done as in

previous one but the communication media is modernized. The wireless communication is preferred. GSM modules with digital communication are very accurate and reliable for wireless communication. These modules have the range up to 1.5 km and the obstacles don't cause any communication failure this way these modules are popular. Microcontroller is used for encoding/decoding purpose. Our project is encoding and decoding techniques for data transmission. These use the ARDUINO UNO microcontroller at both sides and make it feasible to send the data from one place to another place. It is beneficial and cost effective as far as the application importance is considered.

LITERATURE SURVEY

1) The role of communication in day to day life is very important .Communication can be of two types which are wireless or wired. Basically wireless communication is mostly preferred over wired .But sometimes we need a secured wireless communication in case of industries, companies etc. This paper helps in enabling the user for transmitting data wirelessly through ZigBee with encrypting data to provide security. In the paper it consists of two sections they are transmitter and receiver .The data can be sent to microcontroller through pc by using software called hyper terminal, this software is used for serial communication. The microcontroller after receiving the data it forwards the data to the ZigBee transmitter which is connected to the microcontroller. The data is encrypted and then transmitted to receiver. ZigBee transceiver does data transmission. Encryption does conversion of plain text to cipher text. Original data is Plain text whereas the modified data by using operations so that only authorized person can decode is called as Cipher text. Decryption does conversion of Cipher text to Plain text. The received data is decrypted and is displayed on pc which requires some password to open the data. So by this the data cannot be hacked and is secured.[1]

2) Security of data in army stations is an important issue. In early systems, at the time of information transmission between two army stations, it can be hacked by terrorists, spies and enemies. Cryptography is a very important system employed for this purpose. There are various types of algorithms available for encryption and decryption of data and

new algorithms are evolving. Polyalphabetic substitution cipher is a strong algorithm used for security of data in army stations. In this paper, various techniques of security of data and one the algorithm using polyalphabetic substitution cipher are discussed.[2]

3) In earlier security systems, data transmission between two army stations was being hacked by terrorists, enemy nations and even spies. Hence, data security is very important especially from defense point of view. There are various techniques for transmission of data securely. Cryptography is a one of the technique which can be used for secured transmission of data. There are numerous algorithms available for encrypting and decryption data and many algorithms are being discovered. Poly alphabetic cipher algorithm is one of the strongest algorithms used for securing data in army stations. In this paper, poly alphabetic cipher algorithm is discussed for wireless data transmission between army stations using arm7 processor.[5]

PROPOSED SYSTEM

To design a soldier tracking system using wireless system for monitoring the parameters of soldier are as Body temperature & Temperature. Biomedical sensors: Here to find the health status of soldier we are using a body temp sensor to measure body temperature as well as pulse rate sensor. These parameters are then signal conditioned and will be stored in the memory. One of the fundamental challenges in military operations lays in that the Soldier not able to communicate with control room administrator. In addition, each organization needs to enforce certain administrative and operational work when they interact over the network owned and operated by other organizations. Thus, without careful planning and coordination, one troop cannot communicate with the troops or leverage the communication infrastructure operated by the country troops in the same region. The purpose of this investigation was to test the components of the Soldier Tracking and PeGSMormance Measurement System against the statement of requirements as found in the Request for Proposal. Secondary aims of this investigation included gathering data that will allow potential users of the system to

understand its capabilities and limitations, as well as allow efficient planning of both time and resources necessary to ensure efficient and productive use of the system for training the solider.

WORKING METHODOLOGY

A robust accurate positioning system with seamless indoor and outdoor coverage is highly tool for increasing safety in emergency response and military operation. GPS-based positioning methods mainly used to field rescue. The position and orientation of the rescuer and the trapped is acquired using GPS chip. Using the GPS data of both the units the relative distance, height and orientation between them are calculated from the geometric relationships based on a series of formulas in Geographic Information Science (GIS). Using this technology, we are doing the navigation between two soldier .the data will be send tirelessly GSM Transceiver. This device can do accurate coordination via wireless communication, helping soldier for situational awareness. GPS module have serial interface. Receiverinformation are broadcast via this interface in a special data format. This format standardized by the National

Marine Electronics Association (NMEA) .

PHYSIOLOGICAL SIGNALS AND BIOSENSORS With recent advances in technology, various wearable sensors have been developed for the monitoring of human physiological parameters. The various sensing technologies are available, which can be integrated as a part of health monitoring system, along with their corresponding measured physiological signal. The measurement of these vital biosignal and their subsequent processing for feature extraction, lead to collection of real time gathered parameter which can give an overall estimation of health condition at any real time There are a number of medical parameters of soldier that can be monitored, like ECG, EEG, Brain Mapping, etc. But these require complex circuitry and advanced medical facilities and hence they cannot be carried around by the soldier. The entire system would become bulky for the soldier.
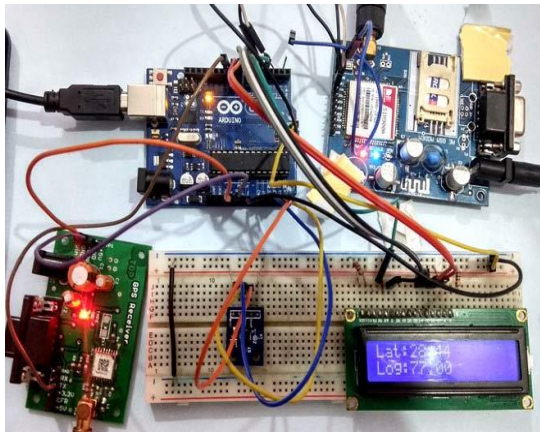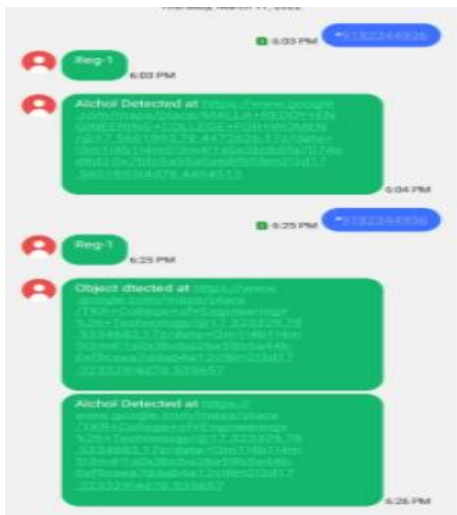
Fig.1. Hardware kit.

Fig.2. Output results.

CONCLUSION

From the above implementation we came to the following conclusion: Security and safety for soldiers: Using GPS we can tracks position of soldier anywhere on globe and also the health parameters which provide security and safety for soldiers. Effective Communication is Possible: Soldiers can communicate anywhere using GSM, DS-SS, FH-SS which can help soldier to communicate among their squad members whenever in need and emergency. Less complex circuit and less power consumption. Since ATMEGA328P processors require less power to operate, power consumption is less. Also the modules used are small in size, so complexity is also reduced.128

FUTURE SCOPE

We are finding the shortest path based on the distance of nearby hospitals but there may be chance that the traffic will be more in that path. So we need to come up with some algorithm which gets the nearby hospitals with minimal distance and traffic. We may add some modules which will also let the system know about the traffic details and then find out which node will take less time to reach from the accident spot. Another thing which we may add is 'first aid kit' for emergency medical treatment at the scene itself. We can also add some modules which will measure the injuries level or some additional information like blood group, heart beats, current glucose level which may be send to the hospitals in advance before the victims reaches the hospitals hence improvise the peGSMormance of the proposed system.

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