ADAPTIVE WEATHER OPTIMIZEDMULTIPURPOSE SAFETY JACKET

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ABSTRACT

As the climatic conditions are changing rapidly, the winters are getting much colder, especially in northern region and the western region of India. Since we developed a smart army jacket using control media devices such as GPS, SENSORS in the jacket. The smart army jacket aims for providing reliable health monitoring as well as position tracking of soldier. Some of climatically conditions are led to unfortunate deaths of soldiers. This jacket can automatically sense the temperature inside, outside using temperature sensors. We are using coils for heating purpose and the temperature of the coil will depends on the outer temperature. GPS model is used for communication purpose. Hence for monitoring the health and the heart rate of the soldier health monitoring equipment sensors are been establish in the jacket as well. In enemy territory soldiers not only have to deal with the physical threat, but also with stress and fatigue caused by protracted operations or lack of sleep. So for the security purpose we need a tool for remote soldier performance and health monitoring. So in this project a tool are implemented using bio medical sensors like heartbeat sensor, temperature sensor for health monitoring purpose by using the microcontroller.

KEYWORDS- Arduino Uno Board, Peltier Module, Battery, Solar panel, LM35 Temperature sensor and LCD Display.

I.   INTRODUCTION

In current world situations, defending our nation from external and internal threats is the most importantfactor and depends on the army force. Every year many army personnel suffer from different injuries duringthe battle and no help can be provided at the needed time. The army suffers a lot due to the unavailability of information of injuries to its personnel which may increase the death/ permanent disability toll. With

the help of many advanced technologies coming into implementation, we can provide safety to the army personnel. It is necessary to develop a system in order to get the location and vital health status of the soldiers which can be tracked in real time. Soldier's location can be tracked using GPS and Wi-Fi module, which is used

to provide wireless communication system between soldier and base station. Health status of the soldier is monitored using bio medical sensors such as temperature sensor and heart beat sensor. Jacket will maintain body temperature to 37 degree irrespective of atmospheric temperature so that solider can survive at minus degree temperature also. We are using technology of Internet of Things for the proposed system. IOT is simply the network of interconnected things/devices, which is embedded with sensors, software, network connectivity and necessary electronics that enables them to collect and exchange data making them responsive. Using IOT, the status of the soldier can be transferred from one place to another over the network. The IOT makes the entire monitoring process efficient, fast and the decisions can be taken in very less time. Using GPS, the position and orientation of soldier is obtained. This system enables GPS Tracking of soldier's message which contains temperature, latitude and longitude as well as pulse rate of soldier. Here we are using ATMEGA328p-pu which allows dynamic and faster control. Liquid crystal display (LCD) makes the system user-friendly. Here we are using LCD Display for displaying the values of present and maximum voltage values which are present in the rechargeable battery. The aim of the paper is to provide medical monitoring for soldier in real time. In other few projects, keypads are used to input some data by soldier which are not so useful and will make the system bulky in size. To overcome this part, we will use a panic button by which a soldier can request for medication from army base station within the wireless transmission and reception range.

II.   LITERATURE SURVEY

To control the temperature, the peltier plates are used for cooling and heating. To monitoring health of respective person the sensors are implemented. To know the location the GPS tracking system is used.

A.   Design: In this process we will design our proposed work in designing software.

B.   Assembly and Installation: In this part we have temperature control and monitoring all data on IOT.

C.   Temperature control: By using peltier plates the temperature is controlled.

D.   Monitoring data on IOT: The blood pressure, heart beat, location and temperature updates all are monitoring on IOT.

E.   Testing & Modification: Testing on peltier plate will carried out on small prototype for the temperature control purpose. The testing will carried out on different weather condition.

III.   OPERATIONAL DIAGRAM
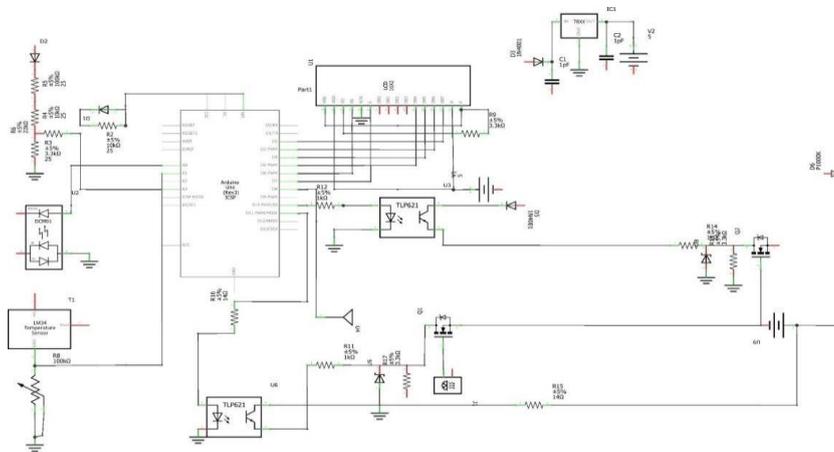
Fig. 1: Operational diagram

The working principle of the system start with charge by using solar energy source, After that temperature sensor detect the weather conditions. According to that, If the temperature is raised out of limit then peltier plate gates signal from temperature sensor and start cool the system up to the limit and if the temperature is decreases below the normal body temperature then temperature sensor gives signal to the peltier plates increases the temperature up to the limit and gives signal to temperature sensor.

We can also detect the heart beat and blood pressure of that respected person by using heart beat sensor and blood pressure sensor. We can sea the information on IOT (Thing speak). In this way we can monitor all information on internet.

1.   ALGORITHM
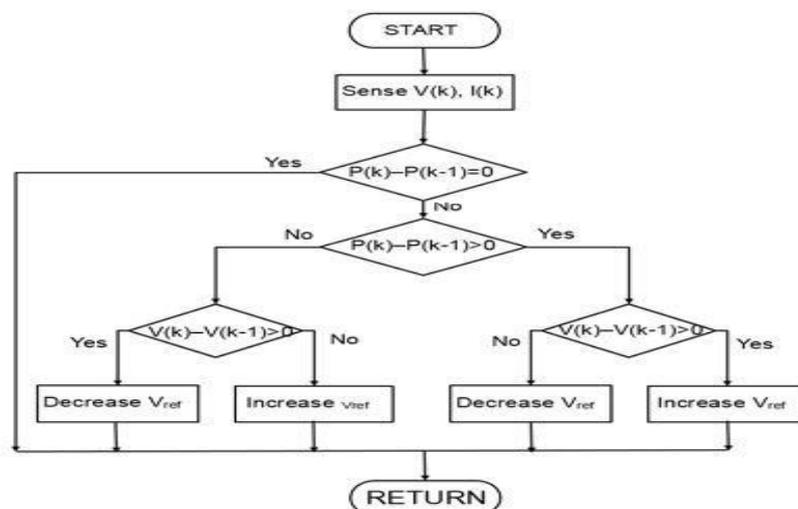
Fig. 2: Flow chart of our project

In this technique first of all the current and voltage of PV is sensed. This power is given by the reproduced of voltage and current of solar panel. The output power is increasing due to the PV current increases. So the reference current is also increased otherwise the reference current is decreased. If the output reduced with increasing solar panel current, the reference current is decreased by one step; otherwise, the reference current is increased by onestep. If the power is increasing. The perturbation will be in the forward direction otherwise direction will be increased. Due to this continuous process PV panel is able to extract maximum power in any environmental condition.
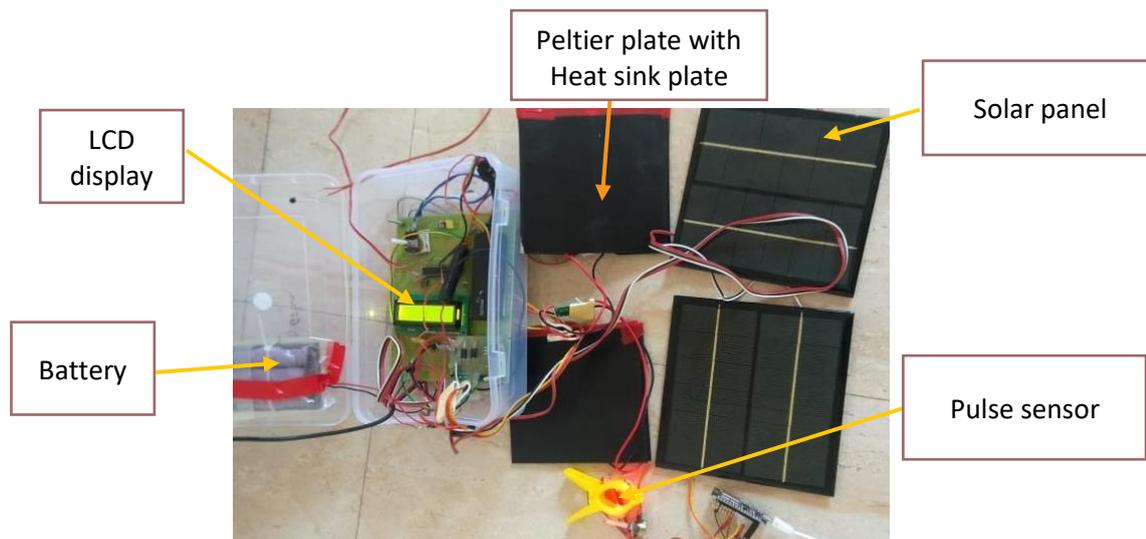

Fig. 3: Hardware Implementation

Firstly we charge the battery to supply the system by using solar power generation. The solar plates are used for generation. After that the battery is charged. The supply from battery is given to peltier plates, controller and biosensors for their operations.

The peltier changes the temperature in normal body temperature. For the sensing the temperature sensor is used. This is controlled by node microcontroller. The heart beat and blood pressure sensor are used to monitor the heathof that respective person. This signals are given to the controller and controller sends this feedback to the IOT. The GPS tracker is used to find the location this is also monitored on IOT.

IV. RESULT

Table 1: Hardware Circuit Results

Sr. No.	Atmospheric temperature ^0C	Hot Plate (1) ^0C	Cold Plate (2) ^0C
1.	42	OFF	28
2.	37	OFF	27

3	28	37	OFF
4.	23	39	OFF
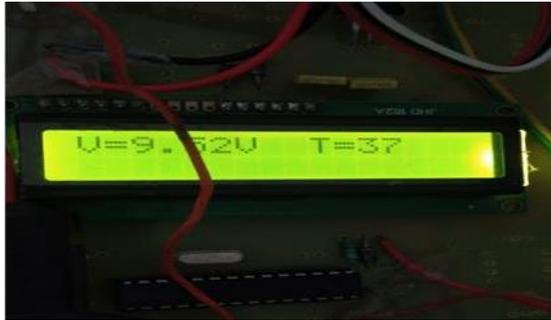
(a)   (b)

Fig. 4: a and b are showing temperature difference obtained while performance

V.   CONCLUSION

Thus we conclude that the multifunction jacket is suitable against weather conditions. This is very effective and required to our soldiers and also other people who suffering from extra heat or cool weather conditions. It should maintain our body temperature normal and make us comfortable.

Self-charging by using solar is more efficient in this system. Due to automatic it is very simple to get all health and respective location information about the person.

VI.   ACKNOWLEDGEMENTS

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