



# TEMPERATURE CONTROLLED BODYSUIT FOR ARMY PERSON

PUNITHAVALLI K<sup>1</sup> SOWNDHARYA R<sup>2</sup> RANJITHA G<sup>3</sup>  
SATHYA P<sup>4</sup>

Department of Electronics and Communication Engineering  
Bharathiyar Institute Of Engineering For Women, Deviyakurichi  
[punithavallik092001@gmail.com](mailto:punithavallik092001@gmail.com)<sup>1</sup> [sowndharya910@gmail.com](mailto:sowndharya910@gmail.com)<sup>2</sup>  
[ranjitha31102000@gmail.com](mailto:ranjitha31102000@gmail.com)<sup>3</sup> [sathyapanjan16@gmail.com](mailto:sathyapanjan16@gmail.com)<sup>4</sup>

## ABSTRACT

Nowadays the world has uncertain and insecurity situation that means the war is cultivated in any time. At the same time the soldiers to join in army is very less. In this critical occasion we have to protect our soldier's lives. To increase the soldier's lives we have created a solution based on embedded systems using IOT. In this project we provide the special advanced techno suit for the army soldiers. For avoiding this problem, we found this suit. This suite is multi purposed suit. It is providing the location of soldier and injuries of the soldiers though IOT data base. IOT is a technology used for security purpose and they are used to safeguard the connected devices and networks in them, it also involves interconnecting computing devices by internet. It reduces the body temperature will goes to high and vice versa goes low increase the temperature it will helps to maintain the body health of the soldiers. It helps the soldiers to maintain his body conditions in a sustainable manner.

**Keywords:** Multipurpose suit, Maintain body condition, Peltier Plate.

## 1. INTRODUCTION

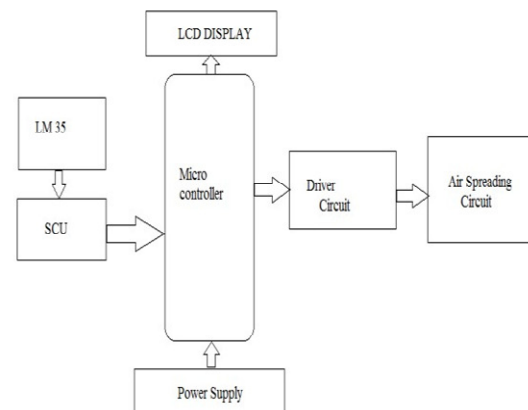
Indian soldiers are the most important resource of our country. They play a very important role to protect the country and the peoples living in the country. Army, Air Force, Navy and Marines all comes under the term soldiers they are always ready to take and hold their duties in extreme weather conditions. The Armed Forces personnel are issued with two types of extreme climate protective clothing. The first version is issued to troops deployed in areas where temperatures do not fall below -20°C and are not perpetually snowbound. This ensemble consists of woollen inner underpants, woollen shirt, serge pants, woollen jersey, and anorak style parka with hood, woollen socks, snow boots, mittens and impermeable gloves. The specially designed EJackets will give better production to the soldiers working in extreme weather conditions. This E-Jacket will operate in twomodes:

DURKADEVI M<sup>5</sup> AP/ECE

AP/ Department of Electronics and Communication Engineering  
Bharathiyar Institute Of Engineering For Women, Deviyakurichi  
[durkadevimani@gmail.com](mailto:durkadevimani@gmail.com)<sup>5</sup>

inside the uniform which helps the soldiers to bear any kind of external environment and he can efficiently work without heat stress or cold stress. The heat-protective clothing can provide a protection for their safety from the external climatic conditions. The proposed system is adaptable jacket based on climate conditions using ARM microcontroller, by which the people/user can easily control the temperature of the jacket. The Peltier plate temperature automatically adjusts according to the condition of the relay circuit. The user wears a climate adaptable jacket as a dress, it observe the temperature status in the LCD, which is placed in this jacket.

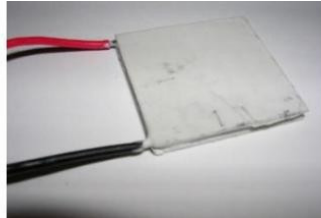
## 2.SYSTEM ARCHITECTURE



## 3. WORKING PRINCIPLE

We are going to control the temperature at the region of army persons, in this 6-volt battery is used throughout the circuit as power supply. The temperature sensor and pulse sensor are connected to the microcontroller (ATMEGA 328P). Here we are using LCD display for displaying value of temperature sensor and pulse sensor. The LED also displaying value of Peltier plate. Thermoelectric cooler operates according to the Peltier effect. The effect creates a temperature difference by transferring heat between two electric junctions. The relay is simple switches which are operated both electrically and mechanically. The buzzer used to indicate the dangerous sound at

risk time of the soldiers. The IOT module (Node MCU) is connected to the microcontroller. It is used to share and track location of the soldiers. The Peltier plates work on the principle of Peltier effect. The Peltier effect is defined as creating a temperature difference by applying a voltage between two electrodes connected to a semiconductor material. This phenomenon is very much useful when it is necessary to transfer heat from one medium to another on a small scale.

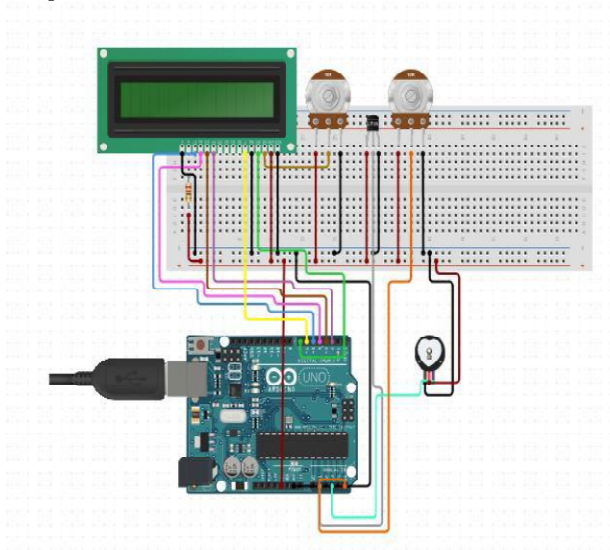


**Fig III (a)**

#### 4. TEMPERATURE MONITORING SYSTEM

Temperature is the most important symptoms that can get reflected in the health conditions of body. Temperature enhances malignancy and body infections. Only constant temperature is computed over a period of time not than a spot of check. It may copy the diagnosis.

The LM35 is an integrated circuit sensor that can be used to measure temperature with an electrical output proportional to the temperature. The output voltage is linear to the Celsius temperature.



**Fig IV (a)**

#### 5. PELTIER PLATE

The Peltier plates work on the principle of Peltier effect. The Peltier effect is defined as creating a temperature difference by applying a voltage between two electrodes connected to a semiconductor material. [1] proposed a novel method for secure transportation of railway systems has been proposed in this project. In existing methods, most of the methods are manual resulting in a lot of human errors. [3] emphasized that people who are visually impaired have a hard time navigating their surroundings, recognizing objects, and avoiding hazards on their own since they do not know what is going on in their immediate surroundings. [4] brought out present disclosure which provides a system for monitoring and controlling farming using drone technology comprising a drone system for monitoring the farm and transmitting information and a ground control system for controlling the drone system and receiving the information.

### 6. HARDWARE DESCRIPTION

#### POWER SUPPLY UNIT

In most of our electronic products or projects we need a power supply for converting mains AC voltage to a regulated DC voltage. For making a power supply designing of each and every component is essential. Here we using the regulated 5V Power Supply.

#### ARDUINO UNO

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the



**Fig VI (a)**

microcontroller on the board.

## DRIVER CIRCUIT

A relay is an electrically operated switch. Many relays use an electromagnet to operate a switching mechanism mechanically, but other operating principles are also used. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal

## 7. CONCLUSION

The project "Temperature controlled bodysuit for army person" is successfully implemented. This system is smaller, less weight and having low power consumption, so it is very efficient. It helps the soldiers to work even in extreme climatic conditions. For the future expansion, this uniform can easily power by a small portable solar panel and echo friendly too. The use of solar panel gives continuous power output. We can also include rain drop sensors, humidity sensors for working purposes. These jackets can be wearable in all weather conditions. We can utilize this jacket to shield us from over-heating & cooling. We can also place heart beat sensor in the jacket.

## REFERENCES

- [1] Christo Ananth, K.Nagarajan, Vinod Kumar.V., "A Smart Approach For Secure Control Of Railway Transportation Systems", International Journal of Pure and Applied Mathematics, Volume 117, Issue 15, 2017, (1215-1221).
- [2] Aditya Gautama Darmoyono, Herman R. Suwarman, Ai Nurhayati, "Utilizing Thermoelectric Generator Peltier in Using Solar Thermal Energy as Renewable Energy Source", 2018 International Conference on Applied Engineering (ICAE) doi:10.1109/incae.2018,
- [3] Christo Ananth, Stalin Jacob, Jenifer Darling Rosita, MS Muthuraman, T Ananth Kumar, "Low Cost Visual Support System for Challenged People", 2022 International Conference on Smart Technologies and Systems for Next Generation Computing (ICSTSN), 978-1-6654-2111-9/22, IEEE, 10.1109/ICSTSN53084.2022.9761312, March 2022, pp. 1-4
- [4] Christo Ananth, Narasimman P, Priya N, Aaron James S, Anupama Prasanth, Densy John Vadakkan, Vinothkumar C, Thangam C, Electa Alice Jayarani. A, Stalin Jacob, Parashiva Murthy B M, R.Uma Maheshwari, "A SYSTEM MONITORING FOR HARVESTING OF FARMING USING DRONE TECHNOLOGY",

Patent number: 2020101843, Australian Patent, 9th September 2020.

[5] Ajay Kumar MTech Student Siddhartha Institute of Technology & Sciences Ranga Reddy Dist, Telangana, India. S Vani, MTech Assistant Professor Siddhartha Institute of Technology & Sciences Ranga Reddy Dist, Telangana, India: "Solar Battery Powered Heating and Cooling Suit" International Journal & Magazine of Engineering, Technology, Management and Research Volume 2, Issue 7, July 2015 ISSN 2348-4845

[6] Vijayakumar, P, Pandiaraja, P, Balamurugan, B & Karuppiah, M 2019, "A Novel Performance enhancing Task Scheduling Algorithm for Cloud based E-Health Environment", International Journal of E-Health and Medical Communications, (IGI-Global), Vol 10, Issue 2, pp 102-117.

[7] P. Pandiaraja, N Deepa 2019, "Hybrid Context Aware Recommendation System for E-Health Care by merkle hash tree from cloud using evolutionary algorithm", Journal of Soft Computing, Springer.

[8] P. Pandiaraja, N Deepa, "A Novel Data Privacy-Preserving Protocol for Multi-data Users by using genetic algorithm", Journal Soft Computing Volume 23 Issue 18, pp 8539-8553, 2019 <https://doi.org/10.1007/s00500-019-04239-1>.