

Solar Based E-Uniform For Soldiers Working at Extreme Weather Conditions

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ABSTRACT

Both very cold and very hot temperatures could be dangerous to health. Excessive exposure to heat is referred to as heat stress and excessive exposure to cold is referred to as cold stress. In a very hot environment, the most serious concern is heat stroke. At very cold temperatures, the most serious concern is the risk of hypothermia or dangerous overcooling of the body E-Jacket which gives better protection to the soldiers who are working in extreme weather conditions. This Jacket will make the soldier to work in any kind of environment. The Jacket is operated in two modes summer mode and winter mode. By selecting the mode of operation, we are operating the Arduino-Uno such that it can drive body heater/cooler. The heater/cooler in turn will help us to provide chilling or warming effect inside the Jacket which helps the soldier to bear to any kind of external environment and he can work efficiently without heat stress or cold stress.

Keywords: Heat Stroke, Over Cooling, Extreme Whether, Heater and Cooler Mode

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I. INTRODUCTION

Soldiers are the Army's most important resource. Soldiers play a vital role to protect one's country. The term soldiers include service men and women from the Army, Air Force, Navy and Marines. They will always be the one responsible for taking and holding the duty in extreme weather conditions throughout the year. While providing security to the nation, they may face troubles in extreme hot/cold weather conditions. Both very hot and cold temperatures could be dangerous to health.

In this project we are going to design an E-Uniform which gives better protection to the soldiers who are working in extreme weather conditions. This paper is gives two modes summer mode and winter mode. By selecting the mode of operation the relays drive body heater/cooler. The heater / cooler in turn will help us to provide chilling or warming effect inside the uniform which helps the soldier to bear to any kind of external environment and he can work efficiently without heat stress or cold stress

II. PROBLEM STATEMENT

1. The man/military in ice land or in snow they work 24 hours and 7 days so their temp. is below zero degree centigrade. They have to survive their and also in desert

their tem. Is above 40 degrees centigrade, and their also we have to maintain body temp. 27 degree centigrade. So we have need to prepare the heating and cooling jacket.

2. In this project we are going to design an E-Uniform which gives better protection to the soldiers who are working in extreme weather conditions.

A. OBJECTIVES

1. Design and develop the E-UNIFORM fir extreme cool and hot using solar system.
2. To develop a prototype model of the same which will show the working of E-UNIFORM for extreme cool and hot using solar system set up with respect to the position.
3. To propose a low cost e-uniform system using solar system
4. To fabricate the design with the knowledge and the selected material which is cost effective

III. CONSTRUCTION

The E-Uniform consists of following components

- Arduino Controller
- TEMP Sensor
- Peltier Plate
- Solar Panel
- LCD 16x2
- RECHARGABLE BATTERY
- Express PCB
- Proteus 7

Working of the setup

Working of setup consist following:

1. In this project we are using Solar Panels to power up the internal circuitry of the E-uniform. A 12 V DC lead acid rechargeable battery is used for storing the energy. We are using conventional battery charging unit also for giving supply to the circuitry.
2. ARDUINO UNO as a microcontroller is the heart of the circuit as it controls all the functions. The project is operated based on temperature experienced. If there is raise in temperature, then our jacket gets cooled and if the temperature is normal then it remains hot. The heater/cooler in turn will help us to provide chilling or warming effect inside the uniform which helps the soldier to bear to any kind of external environment and he can work efficiently without heat stress or cold stress.
3. The temperature sensor is to sense the surrounding temperature. We are using the LCD display for displaying the values of surrounding temperature and modes in which we operate.
4. Peltier Plate is connected to digital pins of Arduino when the temperature is above threshold value then the summer mode is activated and Peltier plate provides chilling effect inside the Jacket.
5. If the temperature reading is below the threshold level, then the winter mode is activated and provides Heating effect.



Fig: Setup of E-Jacket

IV. SPECIFICATIONS

Serial Number	Component	Values
1	Arduino Uno	32bit Atmel ARM Operating Vts.:5v Clock Speed: 16MHz
2	Rechargeable Battery	Lithium ion Battery(li-acid) 12vts/1.3Ah.
3	Solar Panel	Nominal Power: Pmax (W)20 Open circuit Voltage: Voc

		(V)21.4 Short Circuit Current: Isc (A)1.308 Maximum System Voltage:600 VDC
4	Peltier Plate	Heating rate: 20c/min temperature accuracy of +/- 0.1 °C temperature range of -40 to 200 °C
5	LM 35 Temp sensor	0.5C accuracy grantable (at +25c) Range: (-55 to +150C) Operating Vts.: 4 to 30 V
6	Display	Display: 16 Char* 2 Lines Controller: LSI HD44780 IN BUILT Power Supply: + 5v Dc Display Color: Gray Weight: 35g

V. CONCLUSION

- 1) Officers are one of the imperative components in a nation. Since they are the strengths who secure our nation day and night living behind rest and rest. In this manner it is our obligation to ensure them.
- 2) Same is the centrality of this undertaking. So here outline an E Uniform which gives better insurance to the Soldiers who are working in compelling climate conditions. This venture is worked in two modes summer mode and winter mode. In the event that the climate condition is excessively hot then the cooling framework will work and in the event that it is excessively cool then the warming framework will work.
- 3) In addition, we have here calculated the temperature of the surrounding & Battery voltage the same will be displayed on LCD display.

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