

Technical proposal
on
Heatstroke Detection Device

TITLE OF THE PROJECT:
HEATSTROKE DETECTION DEVICE

SUBMITTED TO: PROF. RINKU SHARMA

SUBMITTED BY:
KRISHNA MARAPALLI
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RAJIV GANDHI INSTITUTE OF TECHNOLOGY

Date of submission

12 October 2019

LETTER OF TRANSMITTAL

Date: October 12, 2019

Respected Madam,

I am the undersigned student of your esteemed institute. Under the privileged guidance of Prof. Swapnil Gharat, I made project on heatstroke detection device using Arduino.

This proposed project which is an application of IOT would help you to detect heatstroke and send a call and message to the user .

For the same I hereby request you to grant approval to my project and utilize it in your next site of construction.

Thanking you in anticipation!

Yours Sincerely

Krishna

Grishma

Yash

Draft Contract

Assignment Name: Heatstroke detection device	Approx. value of the contract (in Rs.) 5000
Country: India	Duration of Assignment: 5-6 working days.
Name of the client firm: Dr.Rinku Sharma	Total number of person working on the assignment: 3
Start date: October 5 2019	Deadline provided by the client firm: 10 working days.
Address: Rajiv Gandhi Institute of technology, Versova, Andheri (west)	Approx. value of the service: Rs.500
Name of joint firm (if any): Grishma, Yash and Krishna	Deadline provided to joint firms: 10 working days.
Narrative description: The system will send notification if the user is detected with a heatstroke.	Actual description: The system will detect the heatstroke using lm35 temp sensor and a notification will be sent through an android application.

Executive summary

Many people get heat strokes during the summers because they play in the sun for too long. Heat stroke can potentially be harmful to humans while exercising in hot environments. Many diseases are caused by heat or high temperatures, such as heat cramps, heat exhaustion. In order to prevent this dangerous situation; we designed a Wearable Heatstroke Detection Device (WHDD) with early notification ability. First, we used a number of physical sensors, such as the LM35 temperature sensor, heartbeat, and body temperature, to obtain medical data from exercise personnel. In addition, we designed risk evaluation functional components such as buzzer to detect the features of heat stroke for users. If a dangerous situation is detected, then the buzzer will beep for 15 seconds alerting the user that he is getting a stroke. A notification will be popped and the sms will be sent to the number that is being taken alerting that the user is under excessive temperature for a longer time. It will be helpful for people working in external environment like fire fighters, policemen, etc.

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Introduction

In today's setting, microcontroller based temperature measurement includes broad range of requirements and applications. To meet this wide array of needs the process controls industry has developed a large number of sensors and devices to handle this demand. In this project you will have an opportunity to understand the concepts and use of the LM35 sensor. And effectively conduct an experiment using g this device selection (Collins, 2008). Temperature is a very critical and widely measured variable for most conditions or a particular covering.

Temperature measurement varies in different location judging by the temperature needs to be met at that location. Many processes must have either a monitored or controlled temperature. It may be necessary to monitor more challenging measurements such as smoke stack gas temperature from a power station or blast furnace or rocket exhaust gas. The proposed system indicates that the device detects the heat stroke and alerts the user about the stroke using buzzer and with the Bluetooth we can off the buzzer. In addition the user will get a notification on his\her phone and the SMS will be sent to the relative phone number indicating that the user is under excessivetemperature.

Problem

Many people get heat strokes during the summers because they play in the sun for too long. Heat stroke can potentially be harmful to humans while exercising in hot environments. Many diseases are caused by heat or high temperatures, such as heat cramps, heat exhaustion.

Need

The Heatstroke detection device is a system that is used for detection of a heatstroke during dangerous situations to prevent the user from getting a heatstroke.

Background

Workers in many fields – construction, landscaping, oil and gas extraction, emergency response, firefighters among others – toil in high heat stress conditions. These tasks can lead to rapid increases in body temperature that raise the risk of heat-related illnesses. Wearable technology advances have made it possible to monitor one or more physiological factors of heat strain.

Objectives

- a) To detect the heatstroke.
- b) It can also be used for other alerting systems.

Scope And Limitation

Heatstroke is a major problem in summers if exposed to the sun too much. To avoid such situations a heatstroke detection device can be used which will alert the user if the user is about to get a heatstroke. It will help the user to take preventive measures if any. An Arduino Uno equipped with sensors will be used as the backbone to successfully build a heatstroke detection device.

Professional Issues

- For this project, every single code that will be written will be tested and commented so as to ensure that it is clear enough. The project will have a good documentation and any external library, code or product will be used only if permitted by their providers. In the documentation, all the external information will be referenced.

Legal Issues

- For this project, thorough checking of false statements and libelous so as to ensure that no false data are being shared. The online server that will be used for this project will be specifically only for this project and not for other purposes.

Ethical Issues

- These are the type of issues that raises conflicts between the moral of the system and it principles. Looking at this project, no ethical issues will be raised.

Social Issues

- These are known to be influential problems that affect many individuals around the society. Looking this project, no social issues will be raised.

Methods & Sources

1. Information was collected from related reference books and websites to find out the possible improvement.
2. It was designed on paper on the basis of background research.
3. Components were collected from local electronic market.
4. Worked on building the project and experimental verification.

Plan of Attack

The wearable device will send the sensitive information to android phone via HC05 bluetooth module. As the temperature rises after a particular limit for some duration of time it gives the notification to android and sends SMS. Various techniques are used for the evaluation process so as to ensure that the non-functional requirements and the functional requirements are met. This stage includes testing the prototypes and also analyzing quantitative and qualitative data. Qualitative data is used to see how reliable the system can be. This also corrects results by looking at how heatstroke detecting device operates. Quantitative data is used to see how many times the system successfully responded to commands. After collecting the qualitative and quantitative data, statistical analysis is performed to measure the sufficiency of the system developed.

Sequence of Activities

- a) Arduino programming
- b) Android programming
- c) Wearable device

Arduino Uno is not designed to directly connect to the internet. Therefore a link needs to be added so as to help the application be accessible from the web. Having the information from the Arduino saved on a web storage will facilitate the application to be accessible from any application that will be connected to the server. Therefore it will be an advantage because there is a plan to have an Android application that will be linked to the Arduino application.

Facilities and Products

NO.	REQUIREMENTS
FUNCTIONAL REQUIREMENTS	
1.	Design the wearable device
2.	Develop automated heat stroke detection system
3.	Connect the device to an android mobile
4.	Send temperature status to the android mobile
5.	Update temperature status every time data is received
6.	Temperature rises for certain period then sends notification.
7.	Send sms to relative mobile
8.	User will be notified
NON FUNCTIONAL REQUIREMENTS	
12.	No delays in the application
13.	Fast data processing
14.	Simple sensing of the temperature process
15.	Consistent features
16.	Fast system training
17.	Easy to use

Fig 1.1: Requirements

NO.	EQUIPMENTS & PRODUCTS
1.	Setting up the heat stroke detection device
ARDUNIO PROGRAMMING	
2.	Get open and close
3.	Temperature sensor
4.	Pulse sensor
5.	Bluetooth module
ANDROID PROGRAMMING	
6.	Setting interface
7.	Connecting to Bluetooth
8.	Initialization of the device
9.	Bluetooth communication with Arduino
10.	Set temperature limitation for heat stroke
11.	Testing

Fig 1.2: Equipments and Products.

PERSONAL QUALIFICATION

Name : Krishna Marapalli, Grishma Nagvadaria, Yash Patil

Qualification : Pursuing B.E. (Information Technology) in Rajiv Gandhi Institute
Of Technology.

Cost Estimate

Materials and supplies:

LIST OF COMPONENTS WITH PRICE:

Sr.no	Name	Model	Quantity	Total price
1	Microcontroller	Arduino Nano	1	450
2	Temperature sensor	Lm35	1	150
3	Humidity sensor	Dht-11	1	200
4	Pulse sensor		1	300
5	Some Register		20	50
6	Diode		3	30
7	Piezo buzzer		1	150
8	Connector		1	20
9	AC to DC Power supply		1	180
10	Some Wires			30
11	Cap or wearable items		1	200
12	Capacitor		2	40
13	IC	ATMEGA328P	1	180
Total				2000

Fig 1.3 : List of Components with Price.

Consumables:

Batteries.

Conclusion

For people who live in subtropical or tropical regions, running in hot temperatures is unavoidable. This paper proposed a wearable device to ensure people can remain safe when exercising outdoors. WHDD was designed to monitor the physical information of outdoor runners, and to determine the possibility of a heat stroke occurring while running. We used several sensors to monitor physiological information through the micro-controller, including skin resistance, heart rate, and body temperature data, combined with ambient temperature and humidity. The data was sent to an end device to calculate the risk level using fuzzy logic inference. The system detected the risk level and alerted user to watch their body status to prevent heat stroke from occurring. This device could allow everyone exercising in the heat to never worry their safety and be healthier