CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

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Project Number

J0922

Project Title

TempBot: Device Preventing Febrile Seizures and Other Fatal Complications by Monitoring Sudden Rise in Body Temperatures

Abstract

Objectives/Goals

The goal was to create a low cost continuous temperature monitoring device that detects sudden rise in body temperature and helps prevent Febrile Seizures and other high fever complications in children. It would work as a wrist band and alert adults whenever the temperature crossed defined threshold limits or when the rate of rise in temperature was high.

Methods/Materials

Arduino Uno microcontroller, temperature sensor, cables, LED, and buzzer were used to build the device. Tested device on humans and to simulate sick person initially, meat was heated in oven at different temperatures. Accuracy tested with thermometer and cooking thermometer. Tests were done on healthy and sick adults and kids in different environments and with different types of clothes to study the impact of clothes blocking the sensor. Impact of distance on the accuracy of device was also studied.

Results

Multiple tests were performed with different variables to test accuracy. Tests done on healthy human and meat for simulated sick person showed consistent results. Tests done in different ambient temperatures and different clothes like fleece, cotton, wool showed that the thicker cloth lowered TempBot readings. Readings were less accurate once the distance of object from TempBot was more than 2 cm. Tests done on healthy and sick child and adults showed nearly accurate readings.

Conclusions/Discussion

I observed that TempBot readings were about 3-4 °F lower than thermometer. This is because skin temperature for humans is less than core body temperature. LED bulb lit up for anything over 101 °F. I also added another parameter that made buzzer beep and LED bulb light whenever the rate of temperature increase was >= 2 °F in 15 minutes.

This project helped me expand my knowledge on how to prevent Febrile Seizures and other high fever complications by creating and programming a simple device. This kind of device currently does not exist in the market for household use.

Summary Statement

I created a low cost continuous temperature monitoring device that could prevent Febrile Seizures and other fatal high fever complications in children by alerting adults on sudden rise in body temperatures.

Help Received

I created and programmed the device myself. I researched on internet by watching videos and joining programming forums. My science teacher reviewed my findings.