CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
Diantha T. Ngo

Project Number
38496

Project Title
A Biomedical Application to Smart Textiles

Abstract

Objectives/Goals
The objective of this project is to create a shirt that possesses the ability to monitor and display one's heart rate and body temperature.

Methods/Materials
Materials used were a t-shirt, electrically conductive thread, an LED light, a lithium ion battery, a pulse sensor, the LilyPad Simblee BLE, a lithium ion battery charger, and the LilyPad FTDI Basic Breakout. The LilyPad was programmed through the Arduino interface with a code that would collect heart rate, through a pulse sensor soldered to the LilyPad, and temperature, and display heart rate on an LED and temperature on a phone app. The Lilypad and LED were sewn onto the t-shirt using electrically conductive thread.

Results
I was able to successfully create a shirt that could track the heart rate and temperature of the wearer, meeting my original goal.

Conclusions/Discussion
This shirt is fully functional, simple to use, comfortable, easy to take on and off, and can potentially be marketed as a health and lifestyle product for everyday use, or has purpose in a hospital setting. The concept of smart textiles is versatile and highly useful and I wanted to use this project to showcase their various properties.

Summary Statement
My project is a shirt that possesses the ability to monitor and display the heart rate and temperature of the wearer.

Help Received
Received assistance from science teacher Mr. Jeff Adkins at Deer Valley High School in developing code for project; science project materials paid for by Deer Valley Ace Academy