CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY

Name(s)

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Project Number

J0808

Project Title

Combatting Cardiac Arrest through a Compact and Portable Heart Rate Monitor and Analyzer

Abstract

Objectives/Goals

The objective of this project is to create a compact and portable heart rate monitor that visualizes pulse into waves, allowing for an easier user experience, and to provide the device with the capability to notify certain persons in case of issues, so that action can be taken faster than through waiting for a medical team to arrive.

Methods/Materials

The materials needed are: breadboard, Polar T34 Heart Rate Transmitter, pi Cobbler, Polar Heart Rate Receiver, 1K ohm resistor, 10mm red LED, portable charger, jumper cables, smartphone. The device was tested by allowing 2 healthy persons of different ages to perform 4 activities and comparing the collected pulse to target pulse for accuracy. Then notifications were tested to make sure that the device could easily send alerts to selected people.

Results

Tests were run on two different people doing four activities, two times for each activity. The results indicated that the collected pulse was at most, only 3 beats per minute away from the average target heart rate, proving to be extremely accurate. Notifications were successfully sent fast and easily.

Conclusions/Discussion

I built a compact heart rate monitor and analyzer that visualized the pulse of the wearer in waves and could notify others when help is needed. The various tests and trials conducted proved the efficiency and accuracy of the design. This device could potentially save thousand that die from cardiac arrest annually.

Summary Statement

I designed and built a compact and portable heart rate monitor and analyzer that displays pulse in real-time and notifies chosen people when help is needed.

Help Received

I designed, built, and programmed the device myself. My uncle helped me troubleshoot the code when needed.