CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY

Name(s)

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Project Number

J0806

Project Title

ASD Alert! A Novel Low Cost Device to Help Predict and Mitigate Oncoming Autistic Episodes

Abstract

Objectives/Goals

My objective is to build a low-cost device that can measure galvanic skin response and heart rate, reduce stress, and mitigate an oncoming autistic episode by playing music until help arrives.

Methods/Materials

Laptop with Arduino IDE and Processing 3+. Attached galvanic skin response (GSR) and heart rate (HR) sensors to an Arduino Uno R3 using a variety of pins and wires. Created an Arduino program that reads sensor data, a processing program that measures the user#s average heart rate, and a program that took data from serial port, parsed it, graphed it, analyzed it, and played music at the appropriate time. Average heart rate of each tester was recorded and entered into the program. A constant horror video was played to spike GSR and HR readings of the user.

Results

Currently, this device was tested on 20 people using their average heart rates as a basis for the system. 10 people were used as controls with no music playing at the end of their video to monitor the amount of time it took to calm the user down to their average heart rate. The same was done to the other 10 people- this time with the music. The device met my objective as it read, graphed, analyzed data, and played music. The music I chose did not have an effect on reducing heart rate. The group with the music took an average of 15.02 seconds and the group without music took 15.33 seconds.

Conclusions/Discussion

This cost effective device can help mitigate oncoming autism episodes by playing music to help calm the user. It met my objective when I tested it against real test subjects, even though the music did not calm my participants down. In the real world, this device could aid autistic children by helping them gain independence from their caretaker. It would allow caretakers a little more time to come to the aid of the child, if they are not currently with the child during an episode.

Summary Statement

I created a low cost device that accurately measures GSR and HR and plays music to help mitigate an autistic episode.

Help Received

I worked with my dad and Mr. Williams to understand the basics of code in my experiment. Erik Perkins from Kirby School was my project advisor.