CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

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Project Number

36795

Project Title

Soordi: Glasses to Hear Again

Abstract

Objectives/Goals

There are over 38 million people who are deaf in the United States alone (Harrington, 2014). Cochlear implants, which are used to treat patients who are deaf or hard of hearing, can cost up to $100,000.This is not a practical solution for most people. We designed a device called, Soordi which would be a practical, cost effective solution for these people.

Methods/Materials

Materials include a SparkFun Eletret Microphone, an Arduino Nano, a vibration mini motor, a NeoPixel LED, a 9 Volt Battery, and two 3D printed boxes. Additional materials include wires, resistors, and a capacitor. We created the code entirely by ourselves. We first started by testing our microphone. We made sure that we were getting values from the microphone. Once we were able to get values we added in the NeoPixel LED. At first we tested this by having the LED turn on when the microphone would reach a certain threshold and otherwise be in a turned off state. Once we wrote the code for the LED, then we attempted to allow it to change color based upon the sound level intensity. We tested this in the preliminary stages by emitting certain levels of sound and seeing whether or not the LED would respond accordingly based on the intensity of the sound. Lastly, we added the vibration motor and changed the code so it would vibrate based on sound levels. When testing this project we took into account trying to make deaf people more aware of their surroundings.

Results

When analyzing the data collected we saw that from 1 foot away we were very accurate with an overall accuracy level of 90%, however when moving to 5 feet it had an accuracy level or 37%. However, when only taking into the account the two quietest sounds the data collected from 5 feet away was 91% accurate. We have yet to test our Voice Recognition device in a live setting, however, in time before the CSSF competition we would like to collect data on this device as well.

Conclusions/Discussion

Based upon the data collected so far our device does solve our problem we encountered. It takes in sound as an input and outputs vibrations and a light which will allow a person who is deaf or hard of hearing to be more aware of their environment. We would like to continue collecting data and would like to improve our project. A way in which we will redesign our project include adding a more sensitive microphone and removing most of the wires and making the device wireless with bluetooth.

Summary Statement

Soordi is a cost effective device that allows a deaf or hard-of-hearing user to become more aware of their environment and to respond accordingly based upon this.

Help Received

We designed and built the entire project by ourselves. We had some to minimal guidance from our advisor as to where would be a good direction to move forward in.