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Arduino Echolocation Library

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Our senior design project would focus on one of its many aspects, specifically it's GPS echolocation properties. There are a magnitude of reasons as to why this would be beneficial; from determining danger to acting as added on assistance for the visually impaired. Some visually impaired individuals utilize some sort of visual aid when completing a task, such as walking. Creating a new library that determines the location of something depending on the pattern of decibels returned back, would greatly assist and give them the opportunity to not even need a visual aid like a walking stick. With the assistance of the echolocation library, we will create a new library that allows Arduino to identify a sound and determine its source by analyzing the sound of the decibels.

Although I have never worked with, programmed, or used Arduino in any of my past courses, my partner has and has offered a great amount of information and resources to get my hands wet. I may not know how to code/program Arduino, but I understand and know how to code in general, the only difficulty would be the syntax. Syntax is not a big issue since google is available, even if it may take a bit longer. Also, I have my partner as reference if needed. Besides the coding aspect, I have taken a couple other classes that I believe will help us guide the development of our project. These classes include: Software Development and

Some of my co-op experiences have also given me the necessary skills that I believe will be necessary in accomplishing this project. Some technical skills that I gained from co-op would be learning scripting languages and database experience. I learned both of these while working at General Electric as a Data Analyst. I also gained some non-technical skills while on co-op. Some of these skills include patience and how to actually think through a problem that I may not have the answer to, and

solve it. I gained patience at Ameritas Life Insurance Company. I worked as a Technical Support Associate and learned to be even more patient than I already was because at the end of the day, more things can go awry if you're not patient and taking your time. I gained the experience of properly thinking through problems I originally did not have the experience to while co-oping at General Electric my second rotation.

I have three main reasons/motivation for this project and the preliminary project approach. The first, is to create something meaningful that can be used by anyone especially those who need visual assistance. The second motivation for this project is seeing how far my college education has brought and how much I've been able to learn in the process. This will definitely be a difficult task for me, which I typically tend to run away from, but I am ready to face this head on which is a lot more growth than I would've ever thought. My third and final motivation would be being done with undergrad and just having something to show for it. I am more than ready to graduate and this is basically the last "big bang" or hurdle (however you want to look at it) that I have to get over so I can be on the other side, free from course work!

Our preliminary approach to this project is to first get materials, such as attaining the Arduino and sonar attachments. In the meantime, we can start preparations for creating the library by determining the functions that will be included and used. These functions will then be tested using the robot and sonar attachment so as to get an idea of how things are working. Once the library is completed and accomplished what we need it to, we will be able to create a demonstration. This demonstration will display the robot responding correctly to different sounds such as; water, verbal, crashes etc. The response from the robot determines whether we were successful or not. If it detects the sound accurately, then we will know we succeeded, otherwise, if the robot does not respond or responds incorrect, then we'll know the library still needs some work.