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Arduino Based Third Eye for Blind People

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Abstract: Arduino based third eye or extra vision for blind people have a project which include both hardware and the software work and it helps the person to recognize the object by the help of ultrasonic waves which comes from ultrasonic sensor with a vibration which is generated by the buzzer. This Project is influenced by the Stick which is used by the blind people while walking for long term carry the stick is measure issue for weak people.

So, this is the wearable invention for the weak and blind people they don't need to carrying anything in hand while walking they should only wear our invention and used to get walking easily. The Arduino is a software device which include. coding as a software function and Ultrasonic sensor, buzzer, Battery and more things as a hardware function, Ultrasonic sensor has a work to recognize the object near them and providing the signal via buzzer to the user which help the person to reach properly at their destination.

Main Term: Arduino Uno module, Vibration, Ultrasonic sense

I. INTRODUCTION

Arduino Bases third eye or extra vision for blind people have a instrument which is use to navigate the object while walking. This technology is the first hand, cap, dress wearable technology of blind people which try to solve all the problem while walking inside the house or somewhere indoor the object detection work is done by the ultrasonic sensor and the Arduino where we program for sensor and also buzzer vibration helps to walk freely without colliding. Generally, this project is wearable with the help of Gloves, rubber band etc. and PCB materials helps to build all the hardware object in it, PCB helps to build good connection between parts, and the main part of this instrument is it is very cheap in cost and easy to carry so it will drastically benefit the community.

II. SUPPORT SYSTEM

The support system helps with the effective and proper obstacle detection around gadget which cover the large area of detection. There are various components which helps to make it complete.
1) Arduino UNO software
2) Ultrasonic Sensor
3) Pref Board
4) Buzzer sound
5) Battery
6) Switches
7) LED Light
8) Jumper Wires
9) Male Female header pins

A. Arduino Uno Software

The Arduino is an electronic device which have both hardware and software work which combinedly helps to make an electronic Arduino based project. Arduino is a special type of microcontroller which have extra option of USB port and GPIO pins etc...

Figure 1: Arduino UNO

B. Ultrasonic Sensor

The Ultrasonic sensor is made up of three component Transistor Receiver, Transceiver. The transistor takes electronic signal to give soundwaves, receiver convert soundwaves which will comes from the obstacle into electrical signal and transceiver which is generally receiver object do both the transistor and receiver work. Basically, it helps to measure the distance of an obstacle by emitting sound waves.
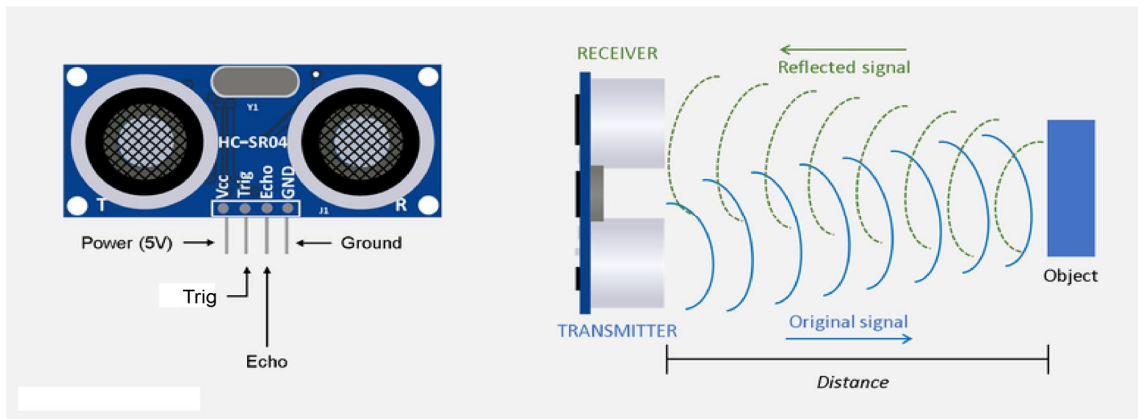

Figure 2: Ultrasonic Sensor

C. Pref Board

Pref board is also called DOT PCB it is a material used for prototyping the electronic circuits. It is made by thin, rigid sheet with proper drilled at equal interval of area generally square area is preferred to drilled dot. It provides the easy way to make connection between electronic circuits.

Figure 3: Pref Board

D. Buzzer Sound

A buzzer is look like an electronics instrument which create sound signal to the channel, buzzer can be of any type mechanical, electromechanical or piezoelectric. It is a sound creating device which convert audio signal into sound signal.

Figure 4: Buzzer

E. Jumper Wires

Jumper wires is almost same as all the connection wires but only difference is they have connectors pins at both the end usage of jumper wire is done in generally prototyping board like pref board and breadboards this wire is make a connection like one corner connected to the device and another corner to the pref board.

Figure 5: Jumper Wires

F. Arduino Software

Arduino UNO is one of the best programming software for above mentioned all the operation which complete the overall project generally Arduino software is written in C++ programming language with some addition of extra special function and methods.
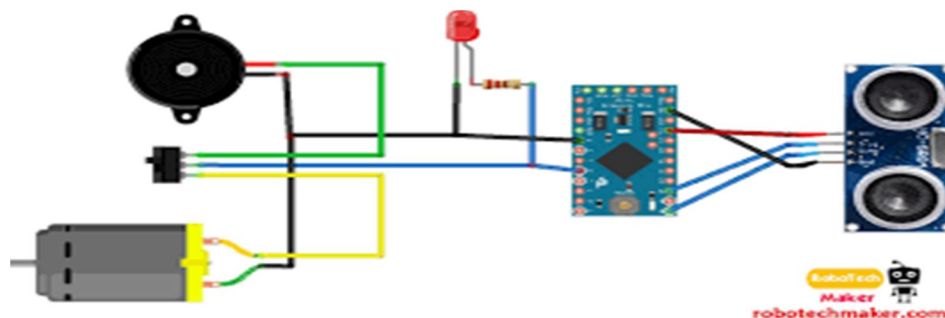
G. System Architecture

Figure 6: Connection Diagram

The Arduino UNO is ready to connected with the ultrasonic sensor and the input signal coming from the ultrasonic sensor is going to the Arduino which have proper input of coding that will perform the required or necessary actions and the output emits   from the Arduino that goes to the buzzer which helps the blind person to identify the obstacle. The system architecture of Arduino based third eye of blind people also contain the Led bulb, battery, Jumper wires which helps to connect Arduino with different hardware like ultrasonic sensor, buzzer, led etc....

III.   WORKING OPERATIONS

The project "Arduino based third eye for blind people" is prepared to provide help for the blind people to tackle the lack of eyesight vision sense. This device uses the audio and vibration signal to alert the people about the upcoming obstacle in his path.

The device generates beep sound when any object comes in front of device holder person and as the distance of object is decreased the sound from the gadgets is increased and vibration is also started. Thus, the gadgets help to easy the detection process for the blind person which have no eyesight to see the obstacle coming around them.

Ultrasonic pin trig is pinned with Arduino UNO pin 7, Ultrasonic sensor pin Echo is connected to the Arduino UNO pin 6 and the buzzer sound should need or not used it all in hand of switch. At the end code will be uploaded to the Arduino board.

By doing above all mentioned work our project are ready to use for the blind people effectively.
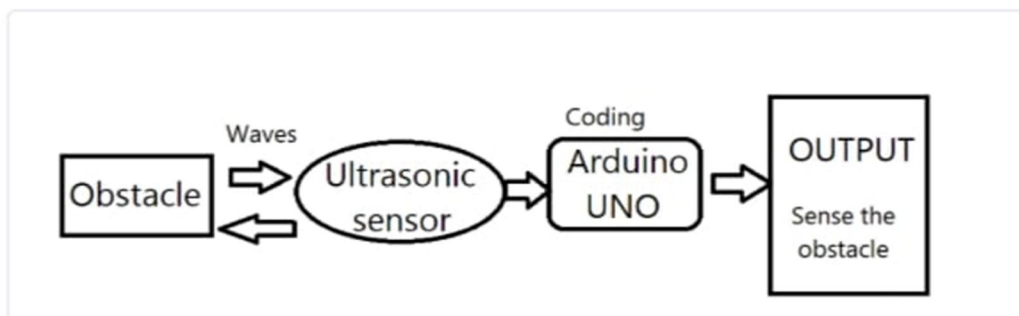
Figure 7: Working Description

IV.   RESULT

Figure 8: Human Trial

With the development of the living standards human need also increase and to fulfill all the need and work on need human needs a proper vision to watch and do work so after all this issue taking in mind our group makes a project that helps blind people to just detect the obstacle and walking freely without colliding, this project not as much help that real eyes do but the person who have this project they feel one thing definitely that they walk one place to another place without taking help of any third person and this project is ecofriendly means no harm to the environment and also easy wearable technology it is so that people don't hesitate to carry it and we all know blindness is the very big challenge which people have face as we can see the above figure which shows the practical result of our project people wear in hand and move across one place to another place by the help of signal which comes from ultrasonic waves.

Some benefits of our project are:
1)   It is portable
2)   Economical
3)   Small and light
4)   Easy to fit with caps, shoes, hand band
5)   Easy understandable mechanism

V.   CONCLUSION

Thus, this project which is built by our group is totally tells us about the architecture and model of Arduino based third eye or extra vision for blind people. A simple architecture device, efficient in use, cheap in cost, easy to carry with us, easy configurable, easy to handle electronic guidance system with proper and easy usages guidance and various effective hardware helps to provides the amazing properties so that it helps the needy blind people. So, talking about this project it has the feature to detect the distance of objects that's are major issue for blind people after detecting the object distance they also told us about the direction where object was detected like left, right, top, bottom. This all feature helps the blind person to easy walk in any direction without colliding with obstacle.

With our given project instruction if it is made as accurate as we were showing in our research paper that helps the blind people to move in any direction without taking the third person help it also makes someone independent from the others and if they have some work so they do by itself. Our project is successfully removing the problem of existing navigation techniques like carry the stick with us while walking, use of another person while moving one place to another and many more issue was successfully resolved by this project. This project, if used on a wider scale and distributed to all the blind people it really makes a bigger impact to the society and the community.

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