



SMART STICK FOR BLIND USING ARDUINO

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Abstract : This paper describes the use of Arduino on ultrasonic sensor for blind people. As there are man blind people, you will realize very well that without the help of others they can't walk or reach their destination, one has to ask for directions. During their daily lives, they have to face more challenges.The smart stick helps blind people to go to their destination and to do their work easily and comfort.

keywords: Ultrasonic Sensor, Arduino Uno, Buzzer, Visually Impaired

I. INTRODUCTION

Present there are thousands of blind people all over the globe. These include people from low sight seeing to complete lost of visual. They find it very difficult while crossing the road or reaching to their destination with the help of anyother individual. The normal stick cannot help to detect the obstacles or objects in front or the potholes in the way. Hence there is a need to update it using today's technology for blind people. The smart stick for blind people as the name indicates, it is a device for the visually impaired to mentor the user to respective place and avoiding to crash with the objects.The blind person cannot recognize what is the size of that object and how far is he/she is from the object and what is the object. It is difficult for blind person for movement But through this smart stick for blinds he/she can walk comfortably without any difficulties.

components required for this project are :

- PVC pipe
- ultrasonic sensor
- Cable tip clip
- Arduino Uno
- Jumper wires
- 3V dc buzzer
- 9V battery

II. SYSTEM PARTS

2.1 Ultrasonic Sensor:

The HC-SR04Ultrasonic Distance Sensor is a sensor used for detecting the distance to an object using sonar. This economical sensor provides 2cm to 400cm .The HC-SR04 uses non-contact ultrasound sonar to measure the distance to an object, and consists of two ultrasonic transmitters (basically speakers), a receiver, and a control circuit. The transmitters emit a high frequency ultrasonic sound, which bounce off any nearby solid objects, and the receiver listens for any return echo. That echo is then processed by the control circuit to calculate the time difference between the signal being transmitted and received. This time can subsequently be used, along with some clever math, to calculate the distance between the sensor and the reflecting object.



Fig 1:Ultrasonic Sensor

2.2 Arduino Uno:

Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects. This board can be interfaced with other Arduino boards, Arduino shields, Raspberry Pi boards and can control relays, LEDs, servos, and motors as an output.

Arduino UNO features AVR microcontroller Atmega328, 6 analogue input pins, and 14 digital I/O pins out of which 6 are used as PWM output.



Fig 2: Arduino Uno

2.3 Buzzer:

The buzzer is a sounding device that can convert audio signals into sound signals. It is usually powered by DC voltage. It is widely used in alarms, computers, printers and other electronic products as sound devices.

This is a Small PCB Mountable 3V Active Electromagnetic Buzzer. It is great to add Audio Alert to your electronic designs. It operates on 3V supply, uses a coil element to generate an audible tone.



Fig 3: Buzzer

III. PROJECT MOTIVATION AND PURPOSE

The goal of the overall project is to provide a low price and efficient map-reading and object detection to support for blind people, so that they can walk independently. Visually impaired people find difficulties detecting obstacles in front of them, during walking in the street, which makes it dangerous. The smart stick for blind people comes as a proposed solution to enable them to recognize or distinguish the world around. In this paper we propose a solution, represented in a smart stick for blind people.

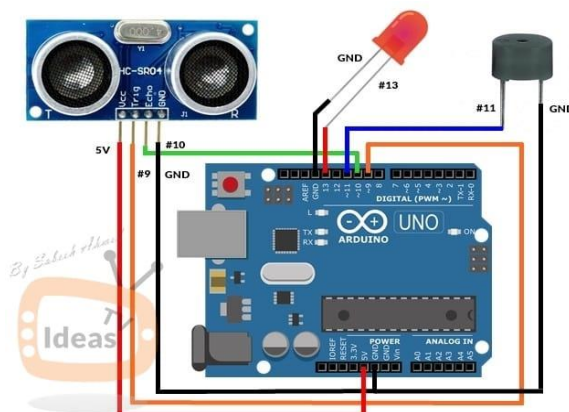


Fig 4: Circuit Diagram

IV. CIRCUIT DESIGN OF SMART BLIND STICK WITH ARDUINO

The circuit consists of Arduino Uno which is the brain of the project, it consists of Arduino Uno, Ultrasonic Sensor, Buzzer, PVC pipe. The design of the circuit is very simple and is explained below:

1. Take Arduino Uno, Buzzer, Ultrasonic sensor, battery, and a PVC pipe.
2. Take PVC pipe and place ultrasonic sensor on it. Connect the Jumper wires on it.
3. Then place Buzzer and Arduino UNO on the PVC pipe.
4. Connect the jumper wires to buzzer and Arduino UNO.

The Connections of circuit diagram is as follows:

- Connector jumper wires to sensor
- Connect sensors VCC to 5 v
- Connect sensors GND to GND
- Connect Echo to Arduino pin#10
- Connect Trig to Arduino pin#9

Take 3 volt dc buzzer connect negative to the power GND positive to Arduino pin#11.

Take battery connect with the battery connector and then connect battery to the Arduino power Jack.



Fig 5: The Device

V. WORKING OF SMART STICK FOR BLIND USING ARDUINO

Arduino Uno is the main module of the device. The Smart Stick for blind people scans the path in front of it with the help of an HC-SR04 Ultrasonic sensor. Whenever the sensor detects any object in its path the buzzer starts beeping. The blind person can hear the beeping sound of the buzzer and handle to change the direction. In this way, the person can easily reach his destination without getting harmed.

VI. APPLICATIONS OF SMART STICK FOR BLINDS

The main intention of this project is to provide an application for blind people to detect the obstacles in various directions, detecting pits and manholes on the ground to make them walk freely. A modern stick is designed for the visually impaired people for their easy route. The smart stick helps blind people to easily walk to their destination, alert a blind person about a dig, auto alarming system, auto detection.

VII. CONCLUSION

Smart walking stick helps the blind person in both indoor and outdoor environment, care-free navigation for mobility. Smart walking stick helps the blind people when the objects occur in front of them. The smart walking stick gives a signal to the person by buzzer when it detects the object the buzzer makes a beep sound and then blind person hears the sound and changes its direction. Smart blind stick is safe for blind people it helps them to walk independently all over the world.

VIII. REFERENCES

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