

SMART VISION FOR BLIND

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Abstract: The Smartvision prototype is cheap, easy to wear device for blind people. These device provide a real time aid in Navigation platform to blind people.by using these device , blind people will no longer rely on others for day to day works , it will decrease the insecurity of them .these device use Ultrasonic Sensor for detection of the obstacles which comes in front of device , when the obstacle is in range of sensor it will sense it and by using a buzzer it will warn the blind person to change his/her path of movement

Index Terms: Ultrasonic sensor, buzzer.

INTRODUCTION

The survey of WHO (World Health Organisation) carried out in 2011 tells us that in world about 1% of the human population is visually impaired and amongst them about 10% is fully blind. The main problem with blind people is mobility. This paper proposes a tool for visually impaired people that will provide them navigation. The oldest and traditional mobility aids for persons with visual impairments are the walking cane (also called white cane or stick) and guide dogs.The main drawback of the problem is that it hardly tell the information regarding range of motion.So, to overcome this drawback , we have developed a smart vision prototype ,which will guide the blind people to navigate the path.

II COMPONENTS REQUIRED

The proposed device distinctly consists of three parts

1. Arduino Uno (microcontroller)
2. Ultrasonic sensor
3. Buzzer

1 ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328 .It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8PU2 programmed as a USB-to- serial converter.



2 ULTRASONIC SENSOR

An Ultrasonic sensor is a device that can measure the distance to an object by using sound waves.The Ultrasonic Sensor sends out a high-frequency sound pulse and then times how long it takes for the echo of the sound to reflect back. The sensor has 2 openings on its front. One opening transmits ultrasonic waves, (like a tiny speaker), the other receives them, (like a tiny microphone).

The speed of sound is approximately 341 meters (1100 feet) per second in air. The ultrasonic sensor uses this information along with the time difference between sending and receiving the sound pulse to determine the distance to an object. It uses the following mathematical equation:

Distance = Time x Speed of Sound divided by 2

Time = the time between when an ultrasonic wave is transmitted and when it is received

You divide this number by 2 because the sound wave has to travel to the object and back.

It consists of four connection points

- 1 VCC
- 2 ECHO
- 3 TRIG
- 4 GND



3 BUZZER

Buzzer is audio signaling device which may be mechanical, electromechanical and piezoelectric. Here we have used piezo transducer which produce beep sound when it is high .

In the circuit , positive lead of buzzer is connected is to Arduino uno pin 9 , negative lead is connected to GND of Arduino .



WORKING

In the smart vision project, ultrasonic sensor works as an eye for the blind people. Whenever the obstacle is detected by sensor, it will send a message to Arduino that the object is in range and then Arduino will send a message to buzzer to produce sound which warn the blind people that the obstacle is near and you want to change the track of your movement. The buzzer will produce different sound that depend upon the distance of obstacle. In these way, it will not tell warn about the object but also tell him about the distance of that object. These will save the blind people from the accidents and will remove the insecurity in the mind of blind people.

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smart_vision | Arduino 1.8.3
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smart_vision

#define trigPin 11

#define echoPin 10
#define buzzerPin 9

void setup()
{
  pinMode(buzzerPin, OUTPUT);
  Serial.begin (9600);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
}

void loop()
{
  long duration, distance;
  digitalWrite(trigPin, LOW);
  
```

ADVANTAGE

Construction :The construction of these is simple and easy as it requires only few electronic components .The circuit involve is relatively simple and easy made in house.

Skill Required : -Since the system of water motor controller is simpler than the ones conventionally available, it can be easily made at house. The controller can also be easily operated by anyone.

RESULTS

The experimental model was made according to the circuit and the results was as expected. When the obstacles comes in front of device, the buzzer produce a sound, which help the blind person his path of movement.

Case	Input	Ultrasonic sensor	Buzzer
1	When obstacle is in range	EchoPin high	On
2	When obstacle is not in range	EchoPin	Off

CONCLUSION:The paper proposed a new concept of smart electronic aid to blind people.The main advantage is that it’s a low cost device which will help a million of blind people to navigate their path of movement. It will not only warn about the obstacles but also tell about the abject is coming near to him or away from him .In these way it’s a completely assist blind people to trace there path of movement and move freely.

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