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(Autonomous)



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SMART BLIND STICK FOR BLIND PEOPLE

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ABSTRACT

- Technologies are growing very fast, which helps people to get a better and easier life. The smart stick is a technique to help sightless people to recognize their way. Sightless people suffer from the lack of ability to do their daily activities, from walking in the street to visiting friends or relatives or any daily things. Therefore, the solution for this major problem is proposed by designing a stick that can aid the person to walk safely without having fear of hitting someone on the way or any solid objects. The electric circuit was simulated using Proteus software for designing and simulating electrical circuits. In this paper, we have used an ultrasonic sensor. The sensor has been placed in front of the stick. To detect the motion from almost every side, it has been used a vibrator and buzzer alarms to alert the person if some obstacle is detected near him.

INTRODUCTION

Visually impaired persons have difficulty interacting and feeling their environment. They have little contact with their surroundings. Physical movement is a challenge for visually impaired persons because it can become tricky to distinguish obstacles appearing in front of them, and they are not able to move from one place to another. They depend on their families for mobility and financial support. Over the last decades, research has been conducted for new devices to design a good and reliable system for visually impaired persons to detect obstacles and warn them at dangerous places. A smart walking stick is specially designed to detect obstacles that may help the blind to move safely. The alarm will keep the user alert and considerably reduce accidents. This system presents a concept to provide a smart electronic aid for blind people, both in public and private spaces. The proposed system contains the Ultrasonic sensor and Buzzer. The Stick measures the distance between the objects and the smart walking stick by using an ultrasonic sensor. When any objects or obstacles come in a range of an ultrasonic sensor then the buzzer will alarm the user. The smart walking stick is a simple and purely mechanical device to detect obstacles on the ground.

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- This device is light in weight and portable. But its range is limited to its size. It provides the best travel aid for the person. The blind person can move from one place to another independently without the help of the other. The main aim of the system is to provide the best environment for blind persons which gives a sense of vision by providing information about their surroundings and objects around them. Our proposed project first uses an ultrasonic sensor to detect obstacles without touching them using ultrasonic waves. On sensing obstacles the sensor passes this data to the microcontroller. The microcontroller then processes this data and calculates if the obstacle is close enough. If the obstacle is far the circuit does nothing but If the obstacle is closed the microcontroller sends a signal to sound a buzzer. The ultrasonic sensor is used to detect any obstacle in front of a blind person. It has a Detection Distance of 2cm-450cmso whenever there is some obstacle in this range it will alert the blind person.

LITERATURE SURVEY

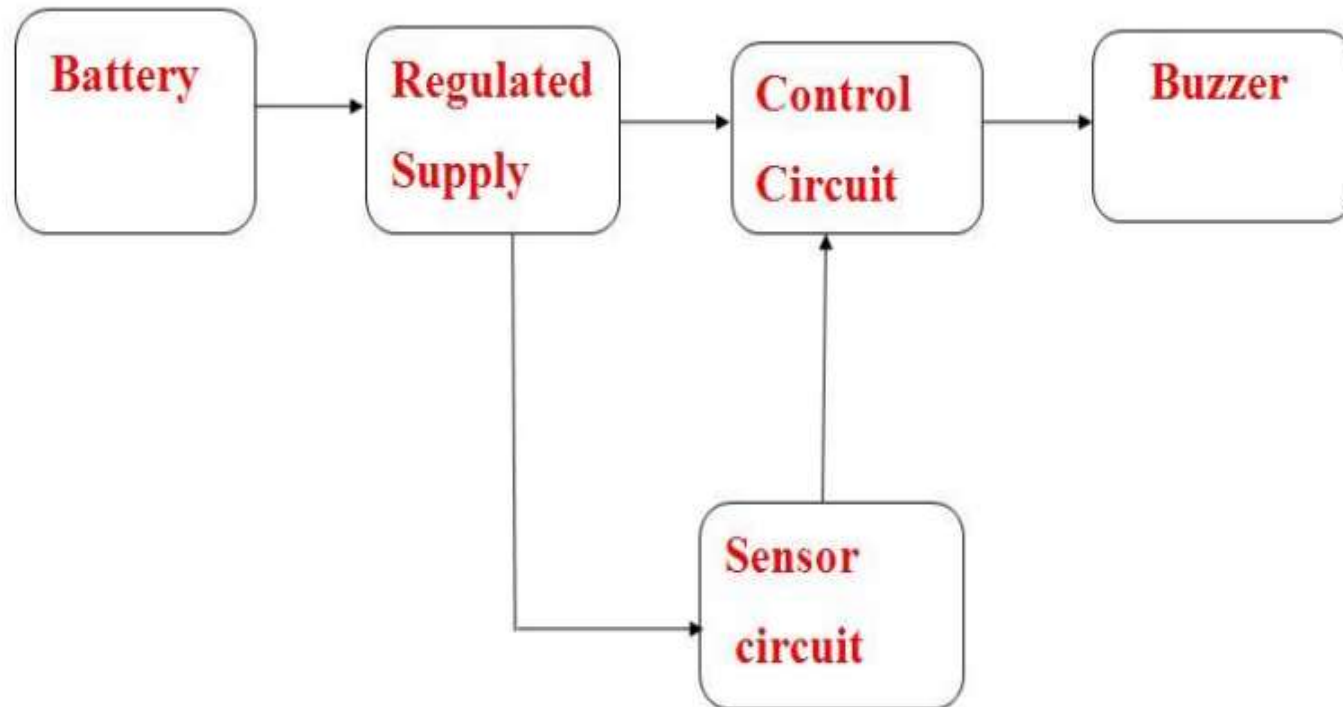
- Title: Smart Stick for the Blind a complete solution to reach the destination. This system uses IR sensor, Ultrasound sensor and water sensor to detect the obstacle. However, this system just gives an alert if any one of the sensor is triggered, it uses a buzzer to alert the blind person. This system does not use any location identifier or location indicator.
- Title:obstacle detection for visually impaired which uses a camera that captures image 15 frame per second and based on the concept of image processing the pothole is detected. Problem with this system is use of camera makes it expensive, and also a lot of images captured per second increases overhead and storage requirement. Paper : Smart Walking Stick for Blind describes about a Stick which use Raspberry Pi and an ultrasonic sensor to detect objects and intruder, the system also has a camera embedded with it, and based on the images captured the objects are detected. The objects are analysed based on the set of image datasets that are already stored. This system however, becomes costly due to the use of high-end camera and also because of storage constraints as large volume of datasets are needed to be stored.

EXISTING SYSTEM

The stick is embedded with Raspberry Pi, GSM module, GPS module, vibrator, switches and sensors. If any sensor is invoked, the vibrator which is placed over the handle vibrates.

If the visually impaired person wants to know their current location they can press the switch assigned for that purpose, an audio regarding the current location is heard by the blind person with the help of a Bluetooth audio device. Different kinds of sensors like water sensor, ultrasonic sensor and Infrared sensor are placed at various parts of the stick making it robust. If the visually impaired person also wants some help during some emergency, a call or a message is sent to a set of mobile numbers stored in a micro controller. It is existing system and we modified system as discussed in this project.

PROPOSED METHOD BLOCK DIAGRAM

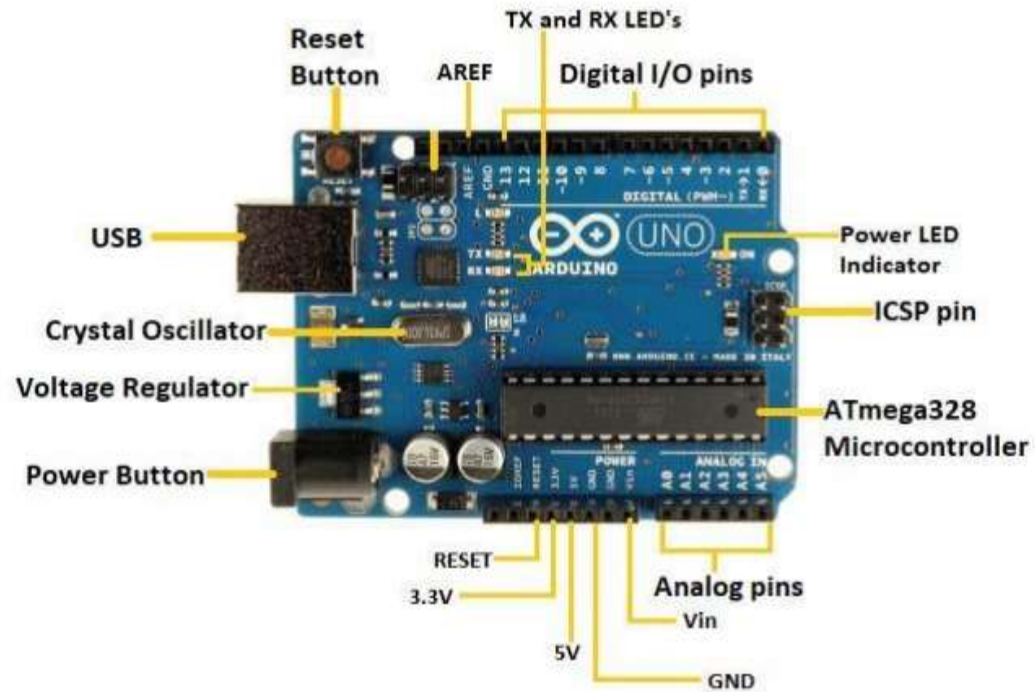


MATERIALS REQUIREMENTS

1. Aurdino UNO
2. Vibrator
3. Ultrasonic sensor HC-SR04
4. 9 Volt Battery
5. Buzzer
6. Switch

DESCRIPTION OF THE MATERIALS

1. Aurdino UNO



2. Ultrasonic sensor HC-SR04

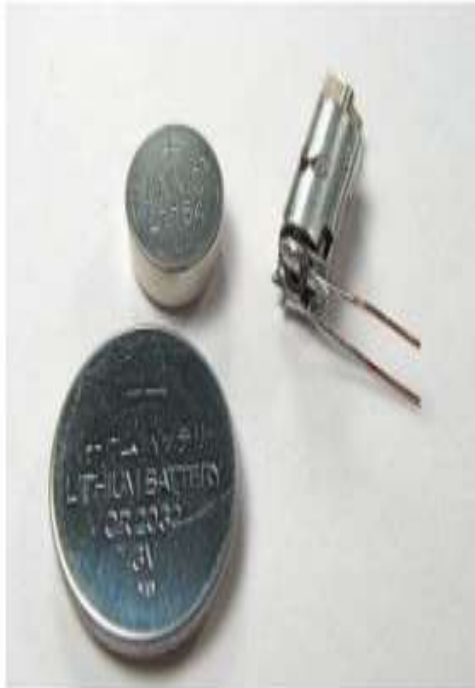


It is an ultrasonic sensor, also known as an ultrasonic transducer that is based on a transmitter and receiver and is mainly used to determine the distance from the target object.

3. Buzzer



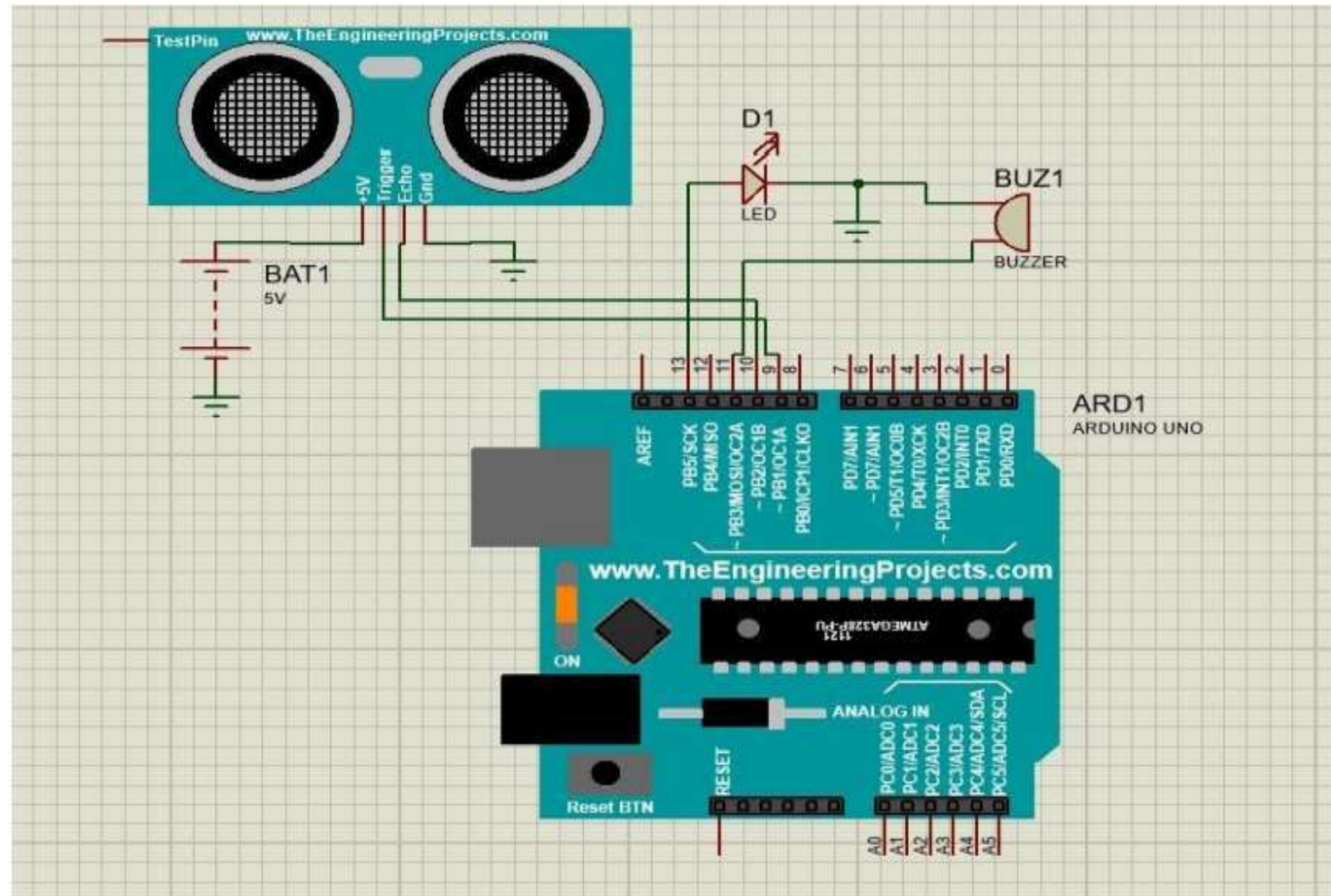
A **buzzer** is a small yet efficient component to add sound features to our project/system. It is a very small and compact 2-pin structure hence can be easily used on Breadboard and even on PCBs which makes this a widely used component in most electronic applications.



Vibrator Motors are the mechanical devices used to develop vibrations. The generation of vibration has happened with the support of an [electric](#) motor having an inequitable mass on its driveshaft. It is a miniature-sized DC motor that lets the user know the sound through vibrations.

IMPLEMENTATION AND CIRCUIT DIAGRAM

CIRCUIT DIAGRAM (WORKING):



SOURCE CODE/PROGRAM:

```
// defines pins numbers
const int trigPin = 9; const
int echoPin = 10; const int
buzzer = 11;
const int ledPin = 13;
```

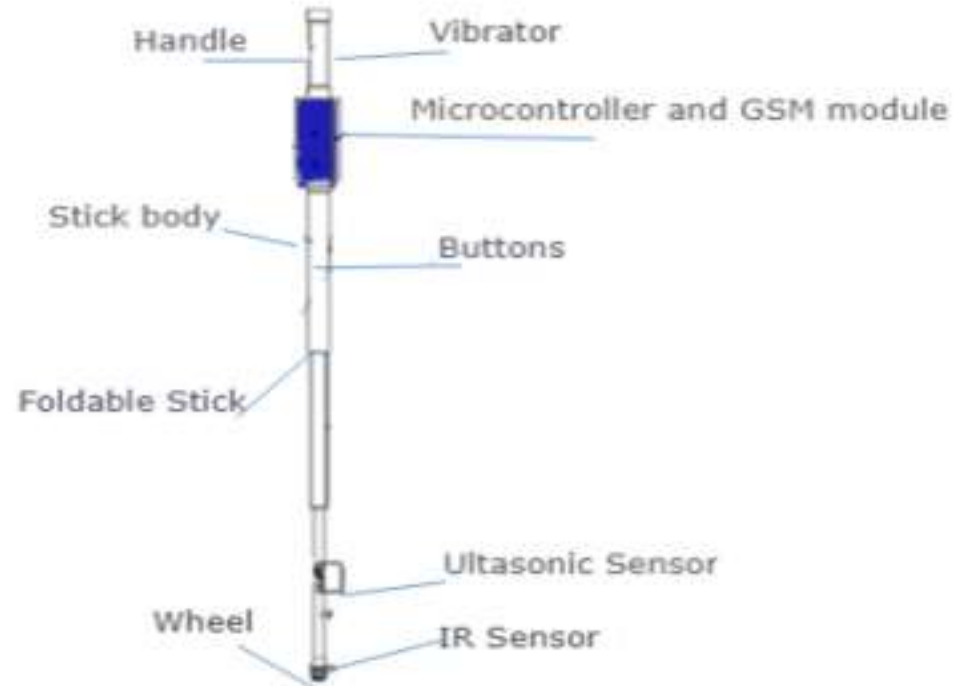
```
// defines variables
long duration; int
distance;
int safety distance;
```

```
void setup() { pinMode(trigPin, OUTPUT); // Sets the
trigPin as an Output pinMode(echoPin, INPUT); // Sets the
echoPin as an Input
pinMode(buzzer, OUTPUT); pinMode(ledPin,
OUTPUT);
Serial.begin(9600); // Starts the serial communication
}
```

```
void loop() { // Clears the
trigPin digitalWrite(trigPin,
LOW);
delayMicroseconds(2);
```

```
// Sets the trigPin on HIGH state for 10 micro seconds
digitalWrite(trigPin, HIGH); delayMicroseconds(10);
digitalWrite(trigPin, LOW);
```

RESULTS AND ITS EXPLANATION:



CONCLUSION AND FUTURE SCOPE

- Blind people face a lot of difficulties while traveling from one place to another. To help the blind, their difficulties, the smart blind stick is proposed. The system consists of an LDR sensor to detect day and night and an ultrasonic sensor for obstacle detection.
- The proposed system takes the blind person to reach the destination without any struggle in their path. After testing, the system proposed in this paper helps users walk in a relatively safe environment reliable and it can be developed further process of study in future...

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THANK YOU