THIRD EYE

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Abstract:
        The third eye for blinds is an innovation that helps blind people to navigate with speedand confidence by detecting the nearby obstacles using the help of ultrasonic waves and notifying them with a buzzer sound or vibration. They only need to wear this device as a bandor cloth. The vibration intensity and rate of beeping increase with a decrease in distance; this is a fully automated device. It will be wearable technology for the blinds. One of the main peculiarities of this device is that it will be affordable. The Arduino Pro Mini 328-15/16 MHzboard is worn like a device. It will be equipped with ultrasonic sensors consisting of modules. Using the sensor, the visually impaired can detect the objects around them and travel quickly. When used on a large scale, with improvements in the prototype, it will drastically benefit thecommunity. Thus, this is an automated device. Thus, this device will be of great use for the blinds and help them travel to different places.

Introduction:

        Since running the daily life of blind people is very difficult, this project helps them runtheir life as usual. They can make this project as a gadget or a device in their hands that detectsthe obstacle. This project is more efficient than the existing system with a cheaper and more accurate one. Here we are using an Arduino board to perform this operation, and making life anormal one for blind people may be a very worthwhile project for them. By making this as a gadget or a device in their hand, they can easily judge an object on their own by knowing the buzzer sound. The system uses ultrasonic sensors as a wide range of fields to detect an object with its higher detection range. According to WHO, 39 million people are estimated as blind worldwide. They are suffering a lot of hardship in their daily life. The affected ones have beenusing the traditional white cane for many years, which, although practical, still has a lot of disadvantages. Another way is, having a pet animal such as a dog, but it is expensive. In this proposed system, we developed a cheap, more efficient way to help visually impaired peoplenavigate with greater comfort, speed, and confidence.

Objectives:

The objective of this project is "The Third Eye for the Blind" is

➢ To design a portable wearable device for the visually impaired and those who often must rely on others.

➢ To help the visually impaired people to move around from one place to another with confidence by knowing the nearby obstacles using the help of the wearable band, which produces the ultrasonic waves which notify them with buzz sounds or vibrations.

➢ To design the device with a portable, cost-efficient, easy-to-manage, an effective system with many more amazing properties and advantages is proposed to support the blind to detect the obstacles even in motion by using a motion PIR sensor.
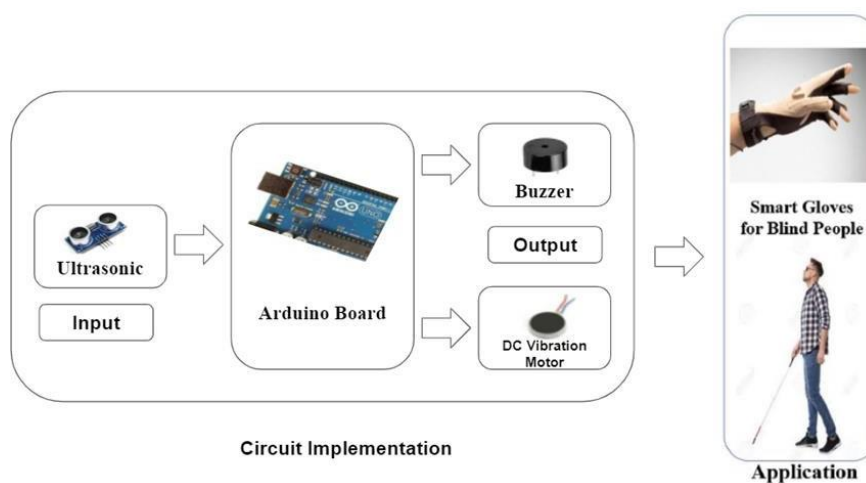
Methodology of Proposed System:

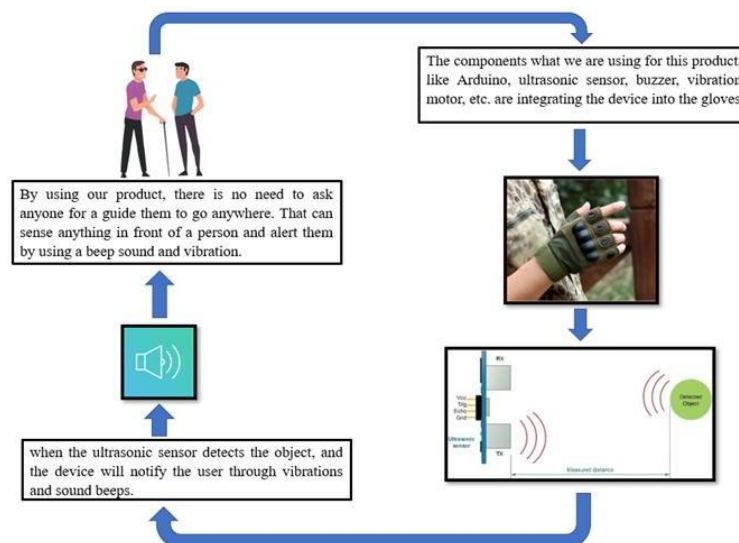Fig. 1 Block Diagram Image of the proposed system

Fig. 2 Methodology of the proposed system

The third eye for blind people is an innovation that helps them move around and from one place to another with confidence by knowing the nearby obstacles using the help of the wearable, which produces ultrasonic waves that notify them with buzz and vibrations. We use an ultrasonic sensor, Buzzer, vibration motor, and an Arduino UNO board to make this product, as shown in Fig.1. Whenever the ultrasonic sensor detects an object or obstacles, it will alert the blind person by continuously giving vibration and a buzzer sound until the path changes. Many accidents occur even while using the stick. Our project helps blind people to recognize the objects in front of them and makes them safe. If any person goes without others, help avoid accidents for that person. Our product is helpful to them. When the ultrasonic sensor detects the object, the device will notify the user through vibrations and sound beeps. The vibration intensity and beeping rate increase with a decrease in distance. The complete methodology shown in Fig. 2.

Results and discussion:
➢ The proposed third eye system was designed using components like Arduino UNO, ultrasonic sensor, Buzzer, DC Vibration Motor, 9v battery, transistor, resistor, and jumperwires. The components list is shown in the Table. 1.
➢ The working principle behind this project is when an ultrasonic sensor detects an obstacle. The emitted waves sent from the ultrasonic sensor get reflected by the sensor, and by this, the waves get sensed; the distance can be measured based on the range then the reflected waves get captured by the Buzzer. The trigger pin present in the Ultrasonic sensor triggers the sound pulses or signals up to a certain distance. When these signals are reflected by touching an object, if these signals are weak, BJT takes place, and weak passwords are converted into strengthening or amplified.
➢ The signals are received by Arduino UNO, which acts as a mediator. Arduino is a microcontroller used to control all functions. It is used to read the inputs.
➢ Now the working of the Buzzer takes place, and the audio signals were converted to soundsignals; then, the vibrator working takes place in process by using centrifugal force the vibrator gets vibrate. Then both the buzzer and DC vibration motor alerts the person with a buzz and the vibrations. Platform easy to use in software and hardware. ECHO pin present in the Ultrasonic produces a pulse after signs get received. Vibration motor takes place which consists of a commutation circuit. It alternates the direction of the field through the coils and interacts with the North and South poles, producing a magnetic field; the vibrator gets vibrated by this. The complete process is done in a fraction of seconds.
➢ All components are assembled in a board and it is shown in Fig. 3a. The complete design was fixed in a glove, as shown in Fig. 3 (b and c). As a prototype, we directly selected the circuit in a single glove. In the future, we plan to assemble in a PCB board that can be used officially by all blind persons.
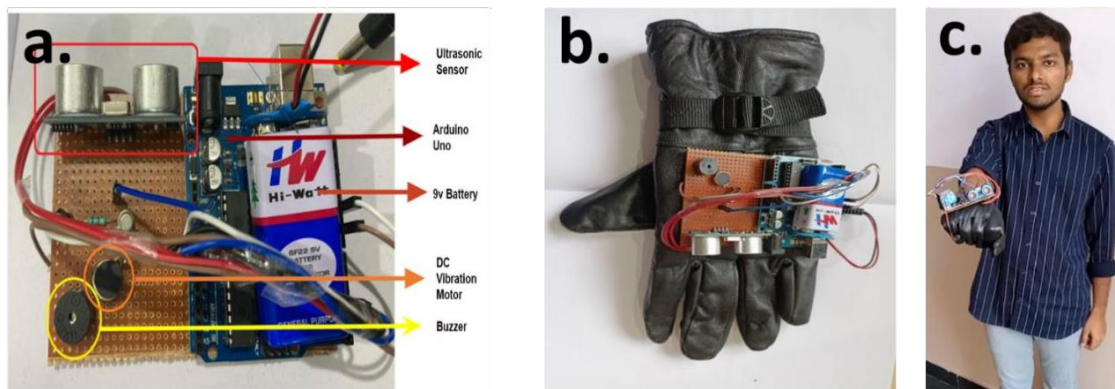
Fig. 3 Photographic Image of Circuit Setup. a. Circuit design; b. Circuit fixed in gloves; c. Person wearing the prototype device

➤ Whenever the blind person wears this prototype third eye sensor device, they can walk down the road without difficulty. They can avoid the walking stick. This Prototype design will quickly identify the obstacles and alert the person accordingly.

Table 1. Components Utilized for the Proposed system (Prototype)

S. No	Component Name	Quantity
1	Arduino UNO	1
2	Ultrasonic Sensor	1
3	Buzzer	1
4	Vibration Motor	1
5	Glove	1
6	9v Battery	1
7	Jumper wires	---

Conclusion:

The primary purpose of this study is to produce a prototype for blind people that can detect objects or obstacles even in motion in front of users and feed warning back, in the form of buzz and vibration, to users. A combination of ultrasonic sensor and Arduino UNO function are used to detect obstacles. The proposed prototype was designed and verified. Now it is used for blind people to facilitate movement and increase safety.

Future Scope

The wearable technology for blinds resolves the existing technical problems. Nowadays, there are many instruments and intelligent devices for visually impaired people for navigation. Still, most of them have specific issues with carrying, and the major drawbacks are those that need a lot of training to use. One of the main peculiarities of this innovation is that it is affordable for everyone. There are no such devices available in the market that can be worn like cloth and have such a low cost and simplicity. When used on a large scale, with improvements in the prototype, it will drastically benefit the community. The prototype device has the following features:

➤ It is a wearable technology for blinds.
➤ It uses ultrasonic waves to detect obstacles.
➤ It notifies the blocks/obstacle by vibrations and a buzzer sound.

In the future, the prototype device will be developed into a complete model using a PCB board. We plan to give this product to the National Association for the Blind (NBA) for authorization. Once it gets approved by the NBA, the device will be provided to blind the schools and homes related to blind people.