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Third Eye for Blind Ultrasonic Vibrator Glove

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ABSTRACT: In this high-tech era, technology has made it possible that everyone can live a comfortable life. But somehow the physically challenged people need to depend upon others in their daily life which ultimately makes them less confident in an unfamiliar environment. But nowadays the explosion of innovative technology provides many opportunities for them to live confidently without feeling as a burden. So in this paper, an intelligent device is represented for visually challenged people to guide them to reach their destination place safely without facing any difficulties. It consists of Raspberry Pi controller, Global Positioning System (GPS) along with sensors like Ultrasonic and other supportive sensors.

KEYWORDS: Ultrasonic, Arduino, Buzzer, Vibrator, Glove

I.INTRODUCTION

According to the WHO, about 30 million people are estimated to be permanently blind worldwide. These people are totally dependent on others. They even cannot walk on their own. We have created designed and built an Ultrasonic Blind Walking Stick device which will help blind people to walk with ease independently. As a simpler version, we have used only one ultrasonic sensor in this project. For better accuracy and assistance two or three sensors can be used. The main objective of this project is to help blind people to walk with ease and to be warned whenever their walking path is obstructed with other objects, people or other similar odds. As a warning signal, a buzzer is connected in the circuit, whose frequency of beep changes according to the distance of object. The closer the distance of obstruction, the more will be the buzzer beep frequency.

II.LITERATURE SURVEY

S.Gangwar (2011) designed a smart stick for blind which can give early warning of an obstacle using Infrared (IR) sensors. After identifying the obstacles, the stick alerts the visually impaired people using vibration signals. However the smart stick focused only for obstacle detection but it is not assisting for emergency purposes needed by the blind. And also the IR sensors are not really efficient enough because it can detect only the nearest obstacle in short distance. S.Chew (2012) proposed the smart white cane, called Blind spot that combines GPS technology, social networking and ultrasonic sensors to help visually impaired people to navigate public spaces. The GPS detects the location of the obstacle and alerts the blind to avoid them hitting the obstacle using ultra-sonic sensors. But GPS did not show the efficiency in tracing the location of the obstacles since ultra-sonic tells the distance of the obstacle. Central Michigan University (2009) developed an electronic cane for blind people that would provide contextual information on the environment around the user. They used RFID chips which are implanted into street signs, store fronts, similar locations, and the cane reads those and feeds the information back to the user .The device also features an ultrasound sensor to help to detect objects ahead of the cane tip.



III.EXISTING SYSTEM

The existing system consists of the devices or the supports like white cane for helping them to detect the obstacles and travel to places, pet dogs, and smart devices like vision a torch for blinds. But there were many limitations and problems in this existing systems like in the white cane, it may easily break or crack. The white cane may get stuck at the pavement cracks of the different objects. Whereas the pet dogs cost is huge and need a lot of training.

IV.PROPOSED SYSTEM

The working behind this blind stick is that it is used for special purpose as a sensing device for the blind people. It is used widely to detect objects using Ultrasonic sensor. If any object is present, the ultrasonic sensor detects the object by measuring the distance between the object and the user and sends the data to the raspberry Pi. To determine the distance of an object, calculate the distance between sending the signal and receiving back the signal.

V.BLOCK DIAGRAM OF PROPOSED METHOD

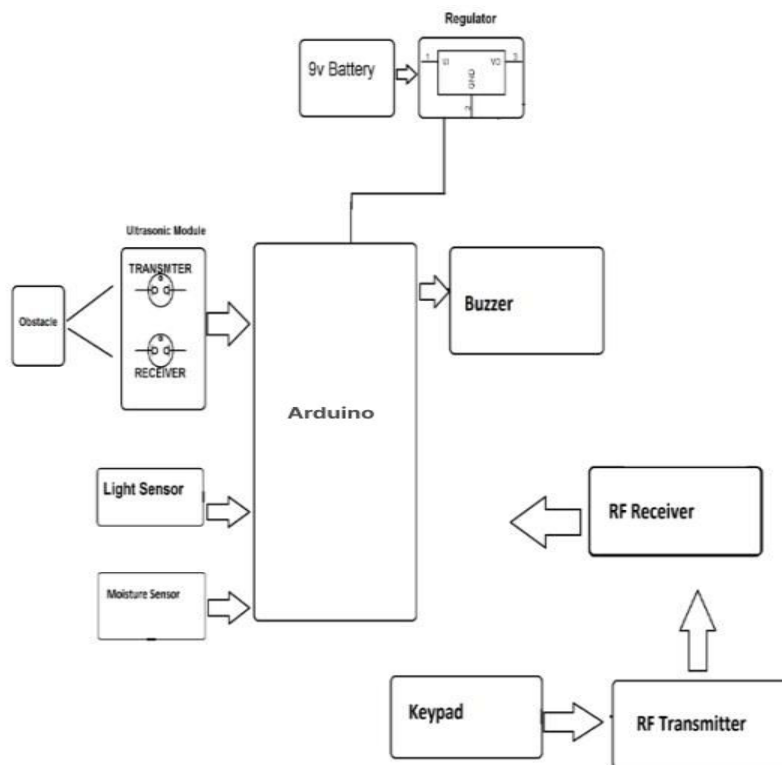


Fig 1 Block diagram

The main component used for this device is the ultrasonic sensor. The ultrasonic sensor transmits a high frequency sound pulse and then calculates the time to receive the signal of the sound echo to reflect back. The sensor has 2 circles. One of them acts as the transmitter and transmits the ultrasonic waves. The other one acts as a receiver (mostly a small microphone) and receives the echoed sound signal. The sensor is calibrated according to the speed of the sound in air. With this calibrated input, the time difference between the transmission and reception of sound pulse is determined to calculate the distance of the object. This circuit is powered by a 9-volt battery through a switch. The main objective is to help visually challenged people to navigate with ease using advance technology. In this technology-controlled world, where people strive to live independently, this project proposes an ultrasonic stick for blind people to help them gain personal independence. Since this is economical and not bulky, one can make use of it easily.



VI. HARDWARE DESCRIPTION



Fig 2 Prototype model

VII.CONCLUSION

All the studies which had been reviewed show that, there are a number of techniques for making a ultrasonic blind walking stick for blind people. The advantage of the system lies in the fact that it can prove to be a very low cost solution to millions of blind person worldwide. The smart white cane is a practically feasible product and convenient to carry around like any other walking stick. This could also be considered a crude way of giving the blind a sense of vision.

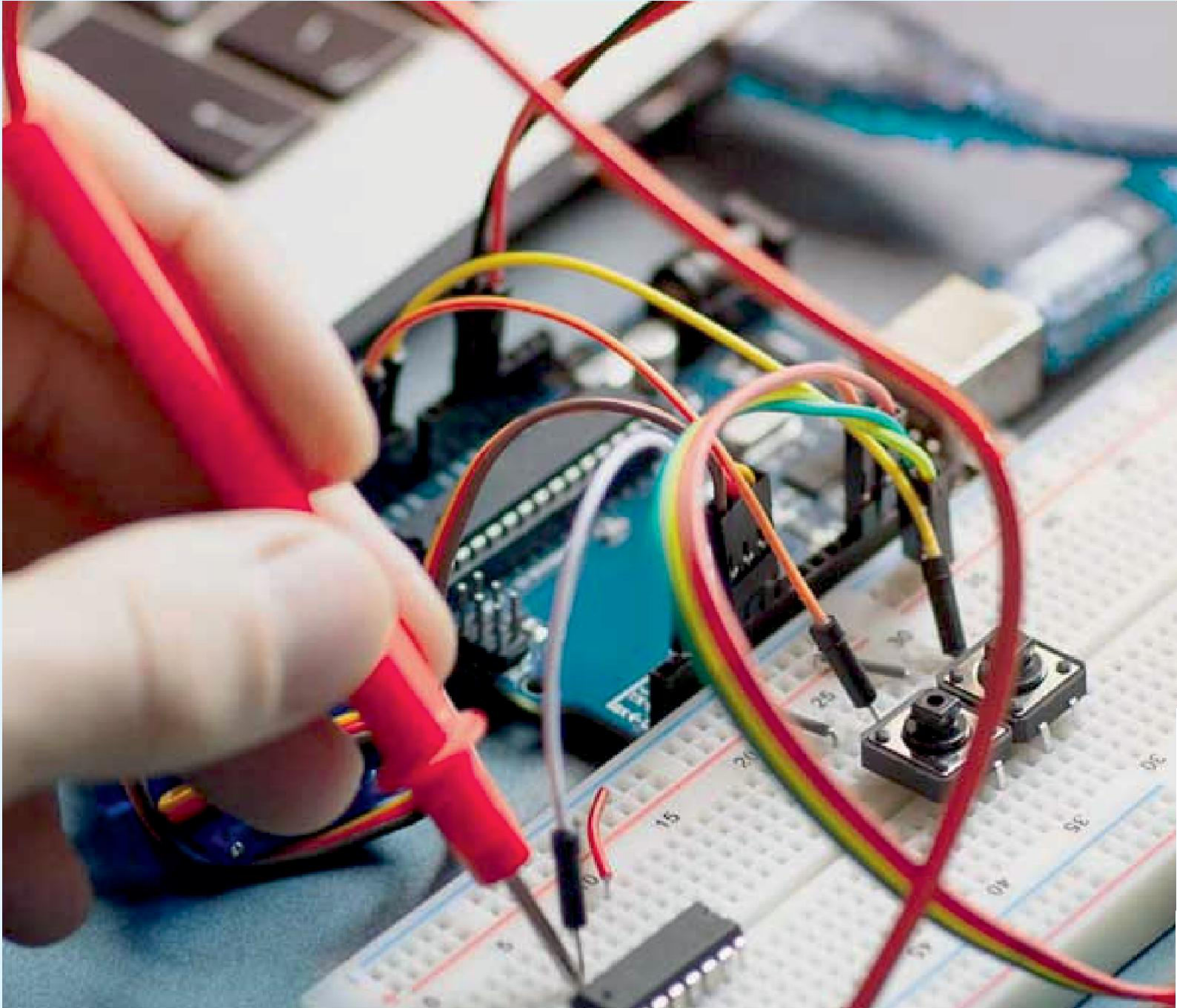
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