



Smart Stick for Blind People

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ABSTRACT :

This paper describes the utilization of Arduino on supersonic blind walking stick. thirty million folks square measure for good blind and 285 billion people are visually impaired, in step with the World Health Organization. once you have taken it into account them, you'll notice very well that while not the help of others they cannot walk. To reach your destination one have to ask for directions. During their daily lives, they need to face additional challenges. The blind handle is safer for an individual to steer. The bar senses the item before the individual and provides the buyer with a wave answer or on demand. And, the person will travel without any anxiety. In addition, we also have an B-safe Application. Whenever blind person feels any discomfort while navigating then he shakes the mobile phone to give the SMS with the message "I am in trouble. Sending my location along with his/her GPS location". This app is the best answer to unravel the issues. The Android application also shows the GPS location of the blind person to his/her family members.

INDEX TERMS : Arduino, Android Studio, C++, Java

INTRODUCTION:

The main aim of this initiative is to enable the blind navigate confidently and to be alert if their walking route becomes obstructed with alternative things, folks or connected odds. within the circuit, a buzzer is connected as a warning signal, whose beep frequency changes counting on the gap of the target. The smaller the obstacle gap, the lot of frequent the beep buzzer is. we are able to say the length of the beep is reciprocally proportional to the scale. The supersonic device is that the main feature of this device. The supersonic device transmits a sound pulse at high frequency, then measures the amount to get the sound echo signal to mirror back. There are a pair of circles within the device. one in all them transmits the supersonic waves and is the transmitter. The other every is a receiver and collects the continual sound signal (mostly a tiny microphone). The sensor is adjusted in line with air rate

of the echo. thereupon measured data, the time distinction between sound pulse propagation and detection is set by calculation of the gap to the target. This circuit is powered through a switch by a nine volt battery.

In this paper, we are tackling the real world problems. Our aim is to provide the technical solution to all kinds of problems. The purpose of this project would be to make the lives of blind people much easier. The project aim to just provide obstacle free path to Blind person so that they can become self-independent as well. At the same time, we realize there may be circumstances wherein the blind person may be wildered about his next movement. In such a situation, we also have a B-safe Application. Whenever blind person feels any discomfort while navigating then he shakes the mobile phone to give the SMS with the message "I am in trouble. Sending my location along with his/her GPS location". This app is the best answer to unravel the issues. The Android application also shows the GPS location of the blind person to his/her family members.

LITERATURE REVIEW:

A lot of research has been in this domain. An electronic blind stick uses ultrasonic sensors, a vibrator motor scheme, a controller and a power unit inside the walking stick. The ultrasonic sensor is used to find the presence of the obstacle and this information is conveyed to the blind person in the form of tactile sensor. In order to avoid collision, the ultrasonic sensors have a sequential firing. With the assistance of change in intensity of vibration, distance variation is experienced by the blind person. Distance is felt by the user in terms of the vibration intensity change [4]. In another proposed system, two ultrasonic sensors are placed on the stick which have range varying from 20-350cms. It means that the value can be set by the user. Moreover, in this model, we have two Infrared sensors which are mounted on the lower side with an intention of avoiding of small obstacles, precisely ranging 2-10cms. In addition, we also have an B-safe Application. Whenever blind person feels any discomfort while navigating then he shakes the mobile phone to give the SMS with the message "I am in trouble. Sending my location along with his/her GPS

location". This app is the best answer to unravel the issues. The Android application also shows the GPS location of the blind person to his/her family members.

IMPLEMENTATION:

A. Technologies used

Various front-end and back-end technologies are available in this era of digitalization. The technologies used in this project are discussed briefly in the following sections.

1) Hardware Implementation

a) ARDUINO

b)



c) The Ultrasonic sensor which is interfacing with the microcontroller, the Arduino programming codes and the real sensor is installed on the microcontroller was part of our system. The Arduino UNO is a ATmega328p - centered microcontroller device. It has fourteen physical outputs and ports, six of them PWM output. It is possible to use six analog inputs and 16 MHz quartz crystal. The moisture sensor consists of 2 samples of wire that rely on the particular water resistance to sensing the water in contact. The RF transmitter is interfaced with the Arduino design codes on the microscope and the RF transmitter is attached with the microscope.

d) ULTRASONIC SENSOR



Ultrasonic sensors collect the data and send it in real time to the microcontroller. The microcontroller triggers the buzzer after processing certain details. The circuits are operated by batteries.

e) RF TRANSMITTER AND RECEIVER

The blind stick is installed with RF transmitter and receiver. Transmitter sends the signal to the receiver and, with this, we have put a buzzer that helps the blind person to easily detect their stick by tracking the echo from where it comes from.

B. Hardware and Software Requirements

The project developed satisfies all the functional and non-functional requirements enlisted. The following specifications are required for the project to run on any device.

1) System Specifications

Processor: Intel(R) Core (TM) i5-5005U CPU @ 2.00GHz

RAM: 2 GB

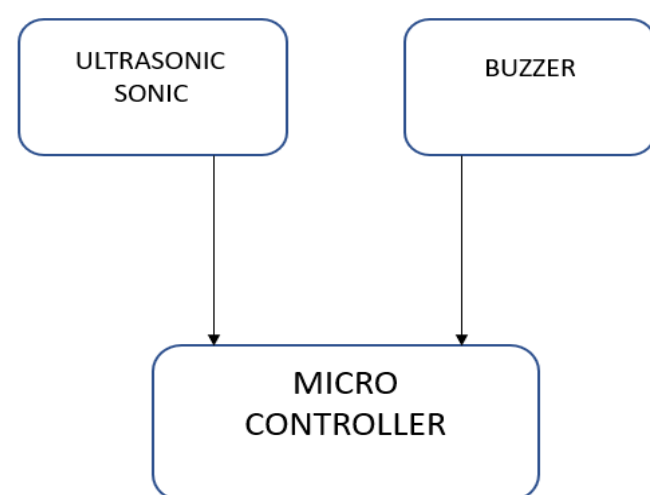
System Type: 32-bit/64-bit operating system, x32 or x64 based processor

Operating System: Windows 7/8/10.

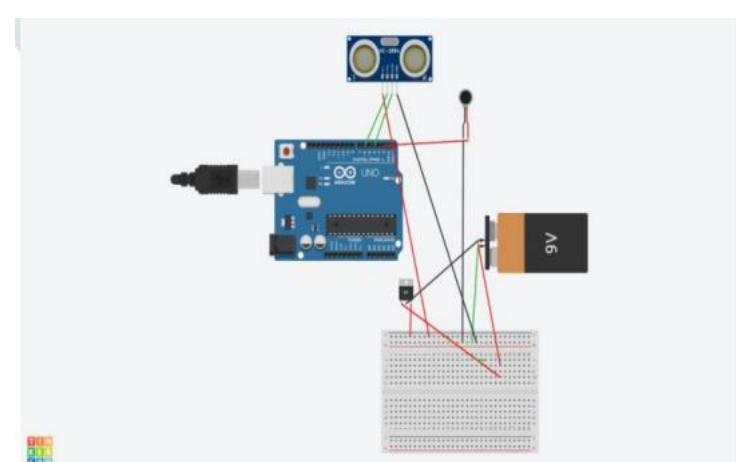
C. Mobile Application Development

The android application is basically has a help to others which enables the application user to get a notified if the user has pressed distress call button. In such a situation, these app will be the medium to get live location of the blind person. Moreover, the application user can guide the blind person regarding his next movement. The application is developed in Java here we give some basic terms which are important for the real time model and for any applied design, in general. Hence with the help of this Service, the program runs even in the background. We can easily observe that onStartCommand () has the suitable code wherein all such requests can be sent.

In order to stop action of helping, onDestroy() service can be used. With clear file, every service need to be declared. We should ensure that our app helps when it is no longer needed. This play a significant role in conserving system resources and also help to reduce power consumption. Thus, ensuring longer battery life.



CIRCUIT DIAGRAM:

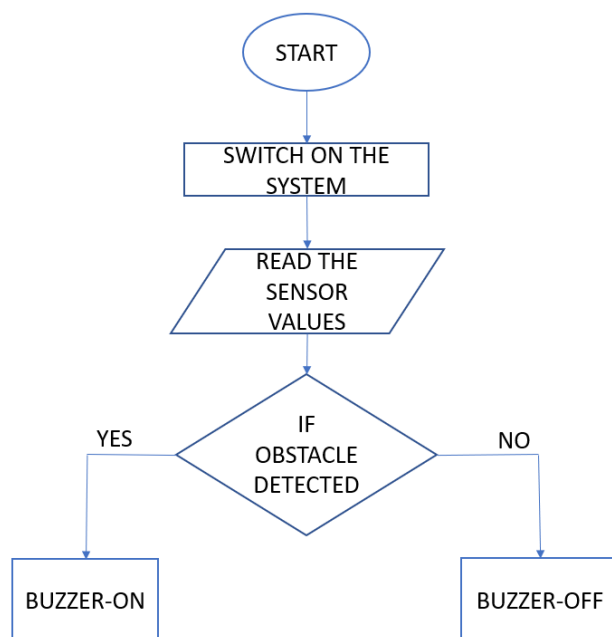


METHODOLOGY:

The project aims at providing ease to blind people in navigating from one place to another. The very first idea is object detection and alert system. The obstacle detection is done using ultrasonic sensors. There are three ultrasonic sensors used in the prototype one facing the front, second one facing the right and third one facing the left directions with respect to stick. The sensors sense the nearby obstacles by using sonic technology. The microcontroller (Arduino UNO) processes the values generated by sensor and calculate the distance from the obstacle. If distance below frequency, then alert signal is generated indicating the nearness of the obstacle. If the blind person feels uncomfortable with obstacle detection technology, in addition we also have an B-safe Application. Whenever blind person feels any discomfort while navigating then he shakes the mobile phone to give the SMS with the message "I am in trouble. Sending my location along with his/her GPS location". This app is the best answer to unarrived the issues. The Android application also shows the location of the blind person to his family member. In this way, Blind person is guided to move along the path by his family member via the Android Mobile Application.

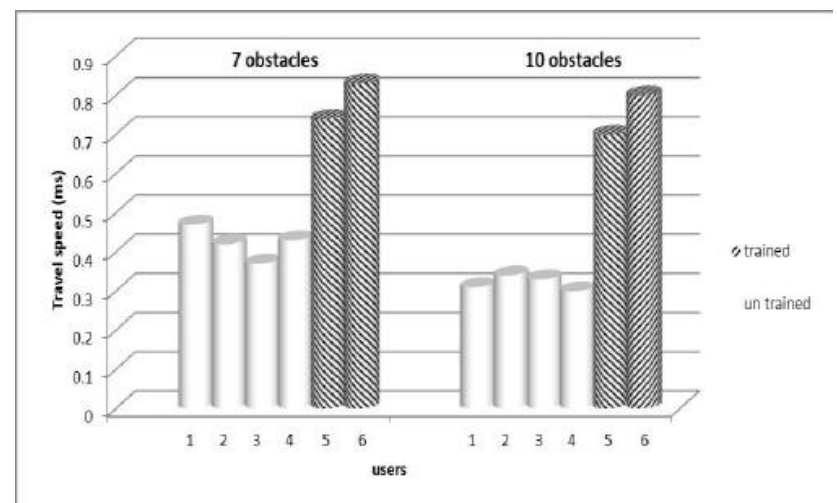
FLOW DIAGRAM :

This is the conceptual device pattern. This consists of a circuit with an ultrasonic sensor interfaced by Arduino Uno. The stick is designed to detect obstacles within 100 cm and increase the frequency of buzzing when the object reaches the stage.



RESULT AND DISCUSSIONS:

Move the Ultra Sonic sensor closer to the target and you will note the beeping of the Buzzer and that beeping volume increases as the stick hits the object. If the LDR is covered in dark or the buzzer will beep when there is too much light. If all is fine then the buzzer won't beep. Thus it will help the blind person to figure out the presence of any obstacle present in front of him/her.



CONCLUSION :

It should be noted at this stage that this work has been thoroughly carried out in order to create a design and implement an effective walking bolt for the blind. The Smart Stick acts as a versatile interface for convenient and comfortable mobility for visually impaired people in the next phase of more supportive apps. It is safe and affordable. This in turn results in effective detection of obstacle within the user's direction. It offers low cost, lightweight, reliable, low power and efficient navigation with fast and quick response times. The smart stick is light weight, with sensors and other features. For further research, we can use hard-core image processing and Artificial Intelligence in the system to detect obstacles and decide the best path on its own.

FUTURE SCOPE :

Wireless connectivity between various components of the device will contribute to enhance the additional features of this instrument and thus increase the range of ultrasound sensors and incorporate improved technologies to measure the intensity of obstacles approaching. Thus, ultrasonic sensor systems, Arduino Uno and other tools can be designed for an approach to alert users about the direction of movement by using audio commands. For flexibility and easy use, a vibrator can also be attached. Further enhancements to boost system performance can be made in future.

ACKNOWLEDGEMENT :

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countries were particularly addressed towards visually impaired and blind people. In this analysis the machine built can only sense obstacles and humidity. No holes can be identified with this device or with the form of barrier. Thus, ultrasonic sensor systems, Arduino Uno and other tools can be designed for an approach to warn users about the direction of movement by using audio commands. For easy use and flexibility, a vibrator can also be attached. Further enhancements to boost system performance will be made in future. Whenever blind person feels any discomfort while navigating then he shakes the mobile phone to give the SMS with the message "I am in trouble. Sending my location along with his/her GPS location". This app is the best answer to unravel the issues. The Android application also shows the location of the blind person to his family member. In this way, Blind person is guided to move along the path by his family member via the Android Mobile Application.

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