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Blind Stick for Obstacle Detection

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Abstract*: 30 million people are permanently blind and 285 billion are visually impaired, according to the WHO. When you consider them, you will realize verywell that without the aid of others they can't walk to reach your destination onehas to ask for directions. During their daily lives, they have to face more challenges .The smart blind stick automatically detects the obstacle in front ofthe person and give him a response to the person by vibrating the stick and alsowith a warning sound through this, the blind person can aware about the obstacle in front of him.*

Key Word: *Arduino Nano, Ultrasonic Sensor, Buzzer.*

I. INTRODUCTION

Aim of this initiative is to enable the blind navigate with confidence and to be alert if their walking route becomes obstructed with other things, people or related odds. In the circuit, a buzzer is attached as a warning signal, whose beep frequency changes depending on the distance of the target. The smaller the obstacle gap, the more frequent the beep buzzer is. We can say the length of the beep is inversely proportional to the size. The ultrasonic sensor is the main feature of this device. The ultrasonic sensor transmits a sound pulse at high frequency, and then measures the period to obtain the sound echo signal to mirror back. There are 2circles inside the sensor. One of them transmits the ultrasonic waves and serves as the transmitter. The other each serves as a receiverand collects the repeated sound signal. This circuit is powered through a switch by a 9 volt battery.

II.LITERATURE SURVEY

The reference stick is used for the indoor and outdoor use of the blind person. Audio feedbacks are provided to the consumer for navigation and obstacle detection .The platform actually uses ultra-sonic sensors to detect obstacles. Once an obstacle is reached or we hit the speech circuit of destination should trigger supplying a sort of expression. Subsystems are connected to a microcontrollerwhich executes the operations and schedules them. Nevertheless, the difficulty of the concept is high. A similar study for the unsightly utilizes bursts echoes methodology to provide a warning sound when the hazards are found.

The United States Military uses this technique to monitor the submarines. The signals hit a hard surface and vary from 21 KHz to 50 KHz. Nevertheless, a strong demand is met . A further review took into account the efficiency and flexibility of our low-cost design. A user friendly android platform has been created. Blind people still keep alert at the buzzer duration and listen to noises. To visually impaired people, a smart stick has been built to help identify obstacles using ultrasonic. With the assistance of these sensors, obstacles within the distance of around 3 m can be observed. The main purpose of this research paper is to provide a simple, economical and effective solution for the visually impaired.

The concept behind the stick's nature was to make it structurally identical, i.e. compact,lightweight and easy to handle, yet provide the consumer with a constructive perspective on the hazards along their walking path.God endowed the human being with sense of vision is an important aspect of our universe. Yet poor people who lack the capacity to imagine situations are some. The mentally impaired have to meet other daily challenges. If they travel to an unknown place, the problem gets worse. Only a few current search programs can provide immersive interaction via speech output for people with visually impaired conditions. For both indoor and outdoor uses, none of these systems work correctly.

In this function, the Blind stick is a revolutionary stick designed to improve mobility for visually disabled people. This is an innovative, blind brace, which helps people with visual disabilities move effectively using state-of - the-art technologies. The use of engineering practices inmedicine in all areas of biomedical research has significantly added results. The creation of advanced supports to mentally disabledpersons is one of the results of this program.

III.BLOCK DIAGRAM OF PROPOSED SYSTEM

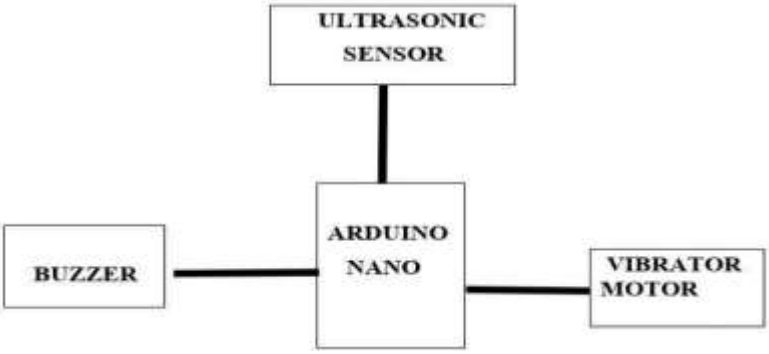

Fig 3.1 Block Diagram of Proposed System

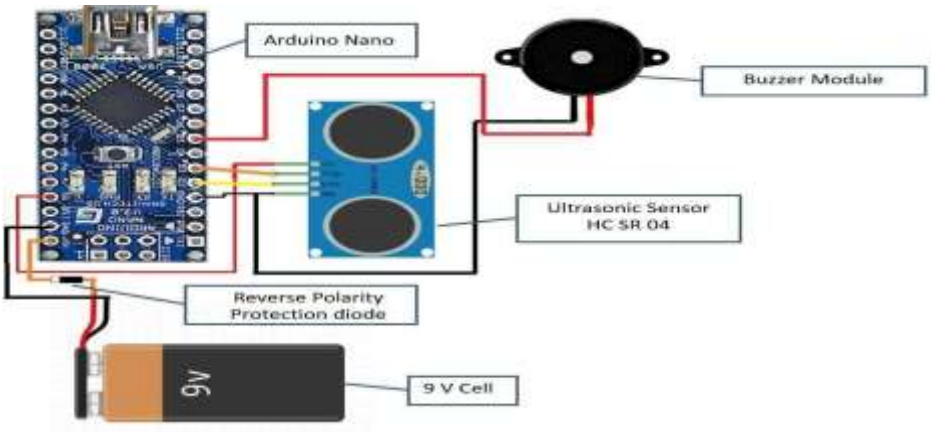

Fig 3.2 Schematic Diagram of Proposed System

IV.METHODOLOGY

4.1 Hardware Used

4.1.1 Arduino Nano :

Arduino can control the environment by receiving input signals (Digital/Analog) and can effects its surroundings by controlling lights, relays and other devices.

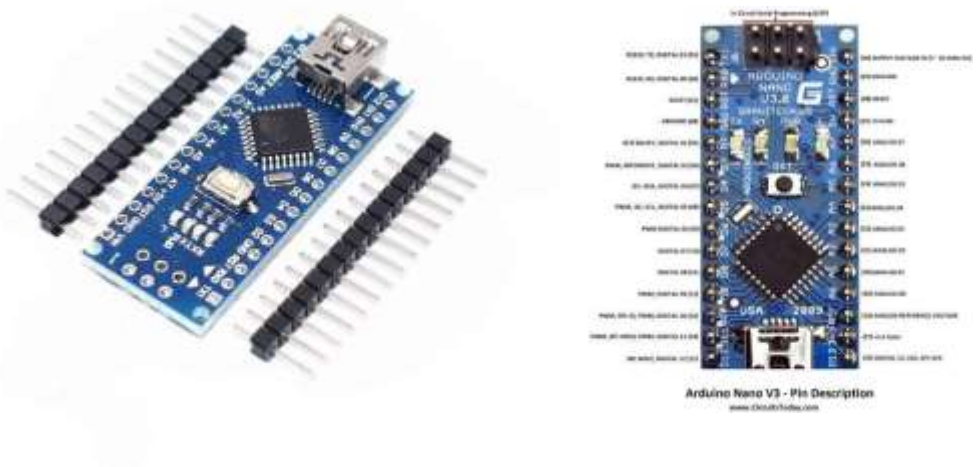

Fig . 4.1 Arduino Nano

4.1.2 Ultrasonic Sensor :

Generating, detecting & processing ultrasonic signals Ultrasonic is the production of sound waves above the frequency of human hearing and can be used in a variety of applications such as, sonic rulers, proximity detectors, movement detectors, liquid level measurement. Ultrasonic Ranging Module HC – SR04.

Fig. 4.2 Ultrasonic Sensor

4.1.1 Buzzer :

A transducer (converts electrical energy into mechanical energy) that typically operates A buzzer is in the lower portion of the audible frequency range of 20 Hz to 20 kHz. This is accomplished by converting an electric, oscillating signal in the audible range, into mechanical energy, in the form of audible waves. Buzzer is used in this research to warn the blind person against obstacle by generating sound proportional to distance from obstacle.

Fig. 4.3 Buzzer

V.RESULT

Move the Ultra Sonic sensor near to the target and you will note the beeping of the Buzzer and that beeping volume rises as the stickhits 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'tbeep.

VI.CONCLUSION

It should be noted at this stage that this work has been thoroughly carried out in order to design and implement an articulate walkingbolt for the blind. The Smart Stick acts as a versatile interface for easy and comfortable internal and external mobility for visually impaired people in the next phase of more supportive apps. It's safe and affordable. This results in effective obstacle detection within three meters of the user's direction. It offers low cost, reliable, lightweight, low power and efficient navigation with fast, quick response times. The computer is hardwired, but light weight, with sensors and other features. Wireless connectivity between components of the device will enhance the additional features of this instrument and increase the range of ultrasound sensors and incorporate technologies to measure the intensity of obstacles approaching. With this approach, our targets in all of the developing 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 performancewill be made in future. These include: an international system for locating the individual via the GPS and GSM systems in order to reach the parent or caregiver venue. It should be flexible and wide range of handling.

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