Smart Blind Stick using Arduino

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ABSTRACT

This paper describes ultrasonic blind walking stick with the use of arduino. According to WHO, Visually impaired can range from mild severe. Worldwide, between 300 million people are visually impaired due to various causes just about 50 million People are totally Blind in the order of 80% of blindness occurs in people over 50years of age. If u notice them , you can very well know about it they can't walk without the help of other. For Blind People without Any Support Its very Difficult to reach there. They faces many problems in their daily routine day to day life. revelation loss was linked by means of suicidal thoughts of suicide attempts, in a new study from south Korea. "People with visual harm often suffer substantial psychosocial consequences," the authors wrote in the British Journal Of Ophthalmology. Ophthalmology is a branch of medicine and surgery which deals with the diagnosis and treatment of eye disorders.

KEYWORDS: Image enhancement, Multiscale fusion

I. INTRODUCTION

Here Blind stick water sensor, Buzzer , Solor panel, Vibrator , Arduino UNO R3, IR sensor are used .Arduino UNO R3 is a microcontroller which can do all the calculations very fastly and quickly with great exactness. Ultrasonic sensor is used for detecting obstacle. For Example, Water, darkness, People. IR Sensor which is used as obstacle detector where it transmits the infrared waves and hits the object and reflected back the signal to sensor. thoseb who have visual acuteness of 6/60 or the horizontal range of visual field with both eyes open have less than or equal to 20 degrees .These people are regarded as a blind .a servey by WHO(world health organization) carried out in 2011 estimates that in the world ,about 1%of the human population is visually impared (about 70 million people and amongst them ,about 10% are fully blind (about 7million people) 90% (about 63 million people).
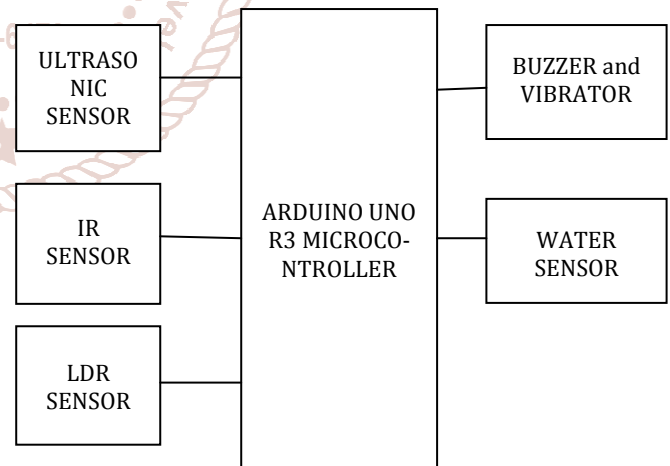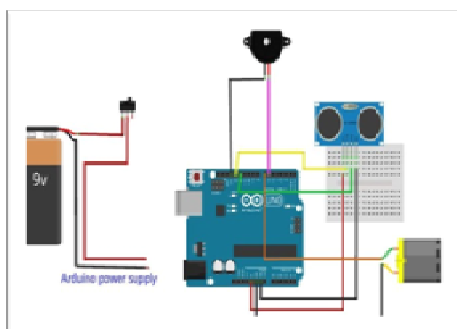

Fig.1 Arduino unoR3 diagram

Fig.2 Block Diagram

II. RELATED WORK

R. Radhika, P.G. Pai, S. Rakshitha and R. Srinath[3] designed and implemented a Smart Stick for Obstacle Detection and Navigation. Their proposed system utilized infrared, ultrasonic and water sensors.

M. H. Mahmud, R. Saha and S. Islam[4] proposed a Smart Walking Stick which is an Electronic Approach to Assist Visually Disabled Persons. Their device is a microcontroller based automated hardware that can assist a blind to detect obstacles in front of him/her promptly. The hardware

consists of a microcontroller PIC16F690 incorporated with ping sonar sensor, proximity sensor, wet detector, a GH311 Ultrasonic obstacle sensor, a micro pager motor and additional equipment. The simplicity of the proposed design makes it easy to use by any person and at the same time the cost of manufacturing such sticks is kept low. The power consumption of the proposed stick is low and can be operated easily. It is also very cheap compared to the conventional ones. Obstacle and hole can be determined easily by sensor readings.

The design has an added vibratory feedback mechanism necessary for creating vibratory signal for multiple disable persons to get precise information from the output. Also, the microcontroller can be code-protected so that its security cannot be overridden except by the user or vendor. Wet, muddy or possibly slippery terrain can be detected by a pair of electrodes. Apart from others blind guidance systems; it has a fingernail controller. This provides mechanical advantage beyond anyone's imagination. Running this integrated set of hardware requires an alternative to the battery. The use of solar panels for instance, will be more advantageous in order to get recharged. The proposed stick is not bendable therefore keeping it might be challenging. This cost effective and light weight device can be designed to take the pattern of a plastic and portable device which can be completely fixed on the familiar white cane or blind stick.

B. G. Roopashree, B. S. Patil and B. R. Shruthi[8] proposed Smart Electronic Stick for Visually Impaired. Their proposed system is a theoretical model and a system concept to provide a smart electronic aid for blind people. The system is intended to provide artificial vision, object detection and emergency messaging facility. Ultrasonic sensors calculate the distance of the obstacles around the blind person to guide the user towards the available path. Output is in the form of beep.

A stick for distance measurement using infrared sensors, have introduced by S. Innet and N. Ritnoom [9] which is a complex and time wasting process. The stick has different vibration modes for different range which is difficult for a blind to differentiate, it needs time for training. The stick informs the person clearly at dangerous stage which conveys less information and safety. The stick has no location and positioning features. J.Na [10] proposed an interactive guide system for indoor positioning, which can't detect the obstacles and hurdles. The system is not suitable for the outdoor activities.

G. Prasanthi and P. Tejaswitha[11] proposed the sensor assisted stick for the blind people. The main objective of this design is to develop an application for blind people to detect the objects in various directions, detecting pits and manholes on the ground to make free to walk. Their proposed method utilizes multiple sensors with features to detect the obstacle for collision avoidance and to detect.

III. HARDWARE REQUIREMENTS
A. ARDUINO UNO R3
Arduino UNO is microcontroller board and its used in atmega328p.it's 20 pins in this are used, out pin is called digital pin and in pin are called as analog pins. digitl pin and analog pin are, 14and 6 used. its used reset butten, icsp heard. Power jack, crystal, 16 mhz quartz, comparator pic microcontroller. the comport are used in AC-DC adapter or battery .

B. UTRASONIC SENOR
Ultrasonic senor used in detect the object and person .its used the echo, trigger, and 4 pins ground .and this range minimum 10 mA .there are used in transmit the signals sender to receiver .this sensor are send signal to another. ultasonic waves at high frequency and receive back the signal.

C. IR SENSOR
This sensor is used to detect infrared waves and detct the obstacle.IR output varios depending on infrared ray that have been received .it is one of the real time application and depend the IR modul.

D. BUZZER
A transducer converts electrical energy into mechanical energy t hat 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

E. LDR
Light Dependent Resistor(LDR), changes its resistances due to change of the light intensity. During night, LDR will have high resistance and no current pass through it but through a LED connected parallel to it which illuminates and acts as a Flashlight, which can be easily noticed by others. It alerts people about the presence of blind person to let him to pass the way.
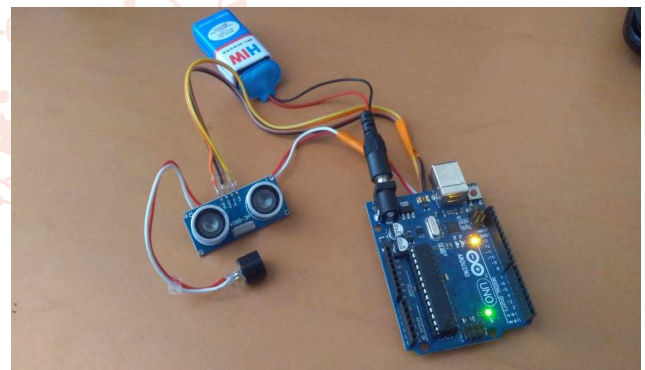

Fig. 3 componts of blind stick using arduino

Fig 4.final blind stick using arduino based

IV. ADVANTAGES
➢ Auto detection.
➢ Obstacle detection with indication support.
➢ Simple to use and low cost.

V. FETURE SCOPE
➢ GPS can help the blind person to source to destination route information.

➢ GPS can help to find the shortest and best path as accordingly to Google.

➢ In solar panel, less consume electricity.

VI. CONCUTION

Light sensor is used to detect the presence or absence of light. Water sensor is used to detect the presence of water. Warning through voice and vibration. GPS for tracking user. The light sensor is used to detect presence or absence of light, if there is no light then the buzzer will be on, warning through vibration and voice message through earphone.

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