iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 6 **Issue:** XII **Month of publication:** December 2018

DOI:

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 6 Issue XII, Dec 2018- Available at www.ijraset.com

A Basic Smart Stick for Visually Impaired Persons

Sachin Saj T K[1], Shruthy Aravind Menon[2], Shankar Saj T K[3]
[1]*Amrita Vishwa Vidyapeetham, Coimabatore*
[2]*Amrita Vishwa Vidyapeetham, Coimbatore*
[3]*AWH Engineering College, Calicut*

***Abstract:** The eye is one of the most important part in the Human body, Numerous activities that Human Being do, is with the help of visuals that is provided with the help of an eye. But, in this world there are quite a lot of people who don't have this blessing and they face numerous amount of difficulties and one such difficulty is Transportation, crossing roads, travelling in trains and many more. Which they can't do without a human assistance. Their dependencies reduce their confidences. Traditionally visually impaired persons were using cane stick to guide themselves by touching/poking obstacles on the way. This has caused many accidents. As the present era is technology driven we decided to help this visually impaired people by using this very technology that we have. We call it "A Basic Smart Stick", this is device which can be used to guide this visually impaired person by sensing the obstacles in the range of the stick without touching/poking it. This stick will sense all the obstacles before the persons and gives the responses to the persons through the different speed of buzzing, by the buzzer. This proposed stick will definitely become an efficient device which can help the visually impaired persons to go independently to a greater extend.*

I. INTRODUCTION

According to many reports, such as World Health Organization and National Federation of the Blind, stated that there are around 253 million people who are visually impaired and out of which 36 million people are blind. And for the interesting fact India is the home to the world's largest number of blind people around the globe. Present day, around the world there plenty of people. Who are visually challenged and finds very difficult to leave independently such as not able to move freely. Normally, visually impaired persons use white canes or dogs for their assistance. But, this both will not perform efficiently. Sensing through simple white cane is time consuming and less efficient and results less confidence in visually impaired person and dogs for this purpose has to be trained properly. There is a chance that the number of visually impaired person number to increase in the near future, at that time we need a cost effective method or device for the persons to walk independently. So, this Paper proposes the design of A Basic Smart Blind Stick which can be made by anyone with very minimal cost.

II. PROPOSED SYSTEM

The block diagram for the proposed model is given fig 1. It consists of simple Arduino, which act as a micro-controller. This proposed model consists of two simple sensors, Ultrasonic sensor and LDR (Light Dependent Resistor) placed at different locations on the stick. The Ultrasonic sensor is used to detect obstacles in front of the persons and the LDR is used to detect the Light conditions around the persons. This signals is passed to the micro-controller, here we have used Arduino. The output is given by the buzzer for various reading of the sensors.

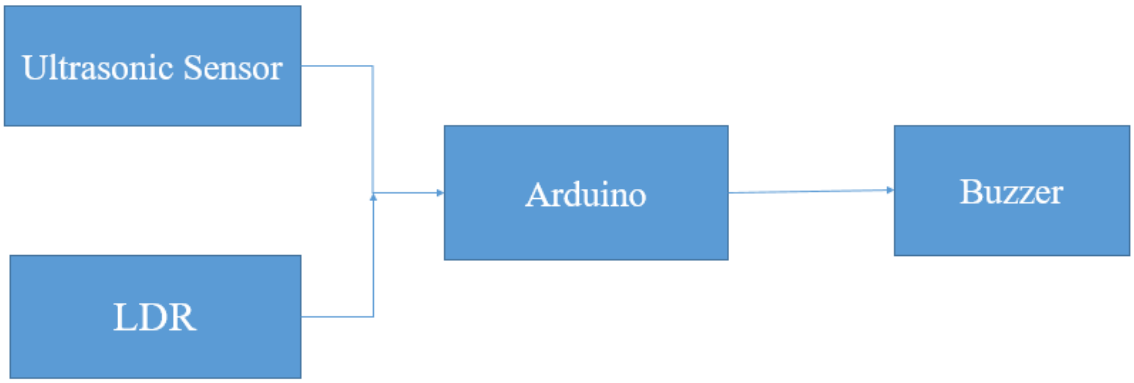


Fig 1 : Block Diagram

©IJRASET: All Rights are Reserved

A. Arduino Uno

Arduino Uno is one of the commonly used board, it is based on ATmega328.This board consists of 20 digital input/output pins, out of which 6 are PWM output pins (pulse width modulation) and 6 pins are analog pins. Apart from that it consists of 16 MHz resonator, a USB connection port, power jack and an in circuit system programming header.

B. Ultrasonic Sensor

Ultrasonic sensor is a sensor which is used to measure the distance between the obstacles and itself. Since it mounted on to the stick, it finds the distance between the stick and the obstacles ahead. This sensor consists of two circular projections, trigger and echo which act as transmitter and receiver respectively. The working of the sensor is that, it transmits ultrasonic signals of high frequency with a speed of 344m/s, this signal gets bounced back after reaching the obstacles ahead and the signal is been collected by the Echo, the inbuilt timer in the sensor, calculates the time taken by the wave transmission and receiving. This is then applied in simple equation (speed = distance * time), to find the distance between the stick and obstacle.

C. LDR

LDR (Light Dependent Resistor) is also called as Photo resistor or Photoconductor. Simple working principle of LDR is that when the light intensity increases around the sensor, the resistance decreases ranging in few ohms and when the light intensity decreases around the sensor, the resistance increases ranges to mega ohms. Some of the advantages of using LDR, is it very cheap and readily available.

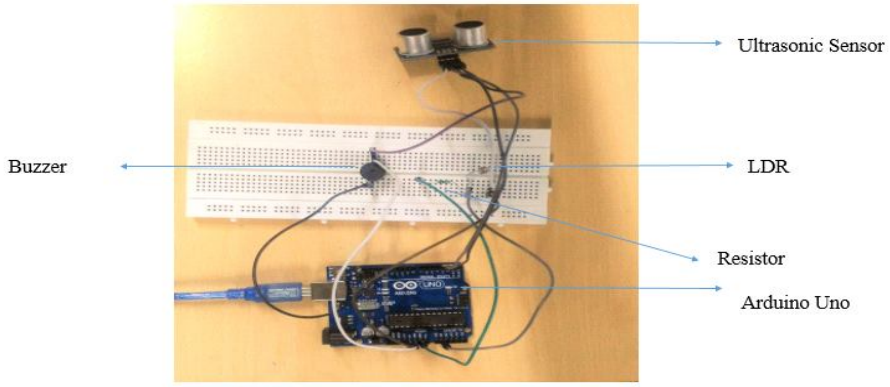


Fig 2 : Proposed Model Circuit Connection

The connections that is required for our basic and cost efficient smart blind stick is given in fig 2. This diagram consists of Arduino Uno, which act as microcontroller here. The sensor Ultrasonic, which is used to detect obstacle and LDR which is used to detect Lighting condition. Both the sensors is connected to the microcontroller and the output responses is given in form of sound that is been produced by buzzer.

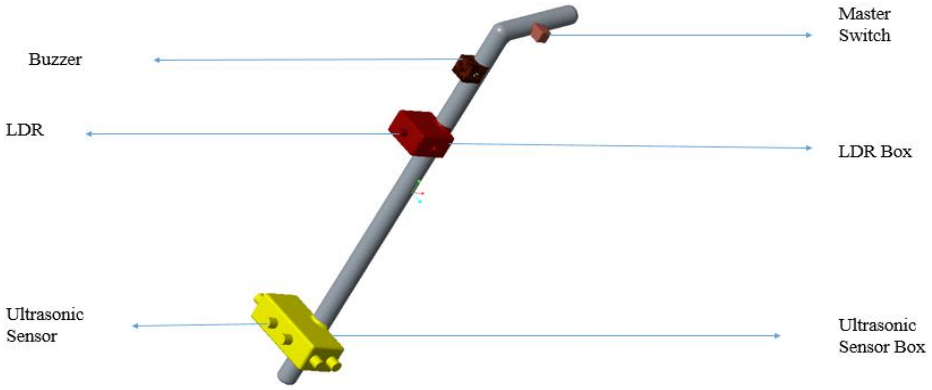


Fig 3 : The Proposed Blind Man's Stick Model

©IJRASET: All Rights are Reserved

Proposed Blind Man's Stick model is shown in the fig 3. This model consists of a master switch which is placed at the handle of the stick. The user can either turn ON/OFF the stick whenever he/she wants. Below that, model have LDR box, where LDR is placed in all three directions, except at back. Through this the user will be able to get signals corresponding to the light conditions from all three directions, the reason why LDR is not kept at back is because if the user wants to keep the stick somewhere, placing it on to the walls, thus the LDR at the back will sense dark condition and gives the wrong signals to the user, so at that location the LDR is not placed. Now, the yellow Box is Ultrasonic sensor box, where ultrasonic sensors is placed in all three directions (Left, Centre, Right) for capturing the signals from all three directions, thus giving much more safety to the user. Finally, the buzzer is placed above the LDR location closer the user, so that the user can hear sound produced by the buzzer much more accurately.

D. Working

As it is mentioned before in this paper, the proposed stick consists of two simple and main sensors that is ultrasonic and LDR. So, when the user is walking with proposed model stick, when it encounters an obstacle ahead, Buzzer gives certain responses to the user. When the user is walking independently on streets, the ultrasonic sensor continuously transmits ultrasonic wave with high frequency in speed of 344 m/s. When this signal finds an obstacle, it gets bounced back, the range up to which sensor can sense is 4 m. Then the signals get received by the receiver and the time of the transmission from the transmitter to the receiver is noted by the inbuilt timing system of the sensor. By using the time information and putting it into simple equation (distance = speed/ time), where the speed of the signal and time is known, thus finding the distance between the stick and the obstacle. If the distance between them is less than certain threshold such as 50cm, buzzer will go high. As the distance between the obstacle and the stick decreases, the speed of buzzing by the buzzer increases, thus giving alertness to user of the obstacles been very close. Since, the proposed model uses sensor in all three directions it gives responses in all three directions, thus giving more safety to the user. Now, for the LDR. This is used to give the user indication of the time and lighting condition surrounding by the user. By giving certain speed of buzzing for light conditions and different one for dark conditions. Thus, it provides information about the surrounding condition to certain extend. In the programming of this proposed stick, the signals from the ultrasonic sensor is given the highest priority, thus if the stick was giving responses to light conditions around the user, suddenly if some obstacles comes before the user. The signal of the ultrasonic sensor will be taken with highest priority by activating interrupt service routine in Arduino Uno. Thus assuring the safety of the user.

III. CONCLUSION

The gadget which is been proposed will help visually impaired people around the globe. The reasons for it been useful gadget is

A. Proposed Stick does not require heavy machinery for its manufacturing, it can be made easily and can be made by anyone.

B. The Stick is very simple, cheap and easy to handle electronic guidance system which is proposed to provide constructive assistant for the visually impaired persons

C. The proposed system is user-friendly device and can serve basic functionalities, that is required for the visually challenged persons to go independently.

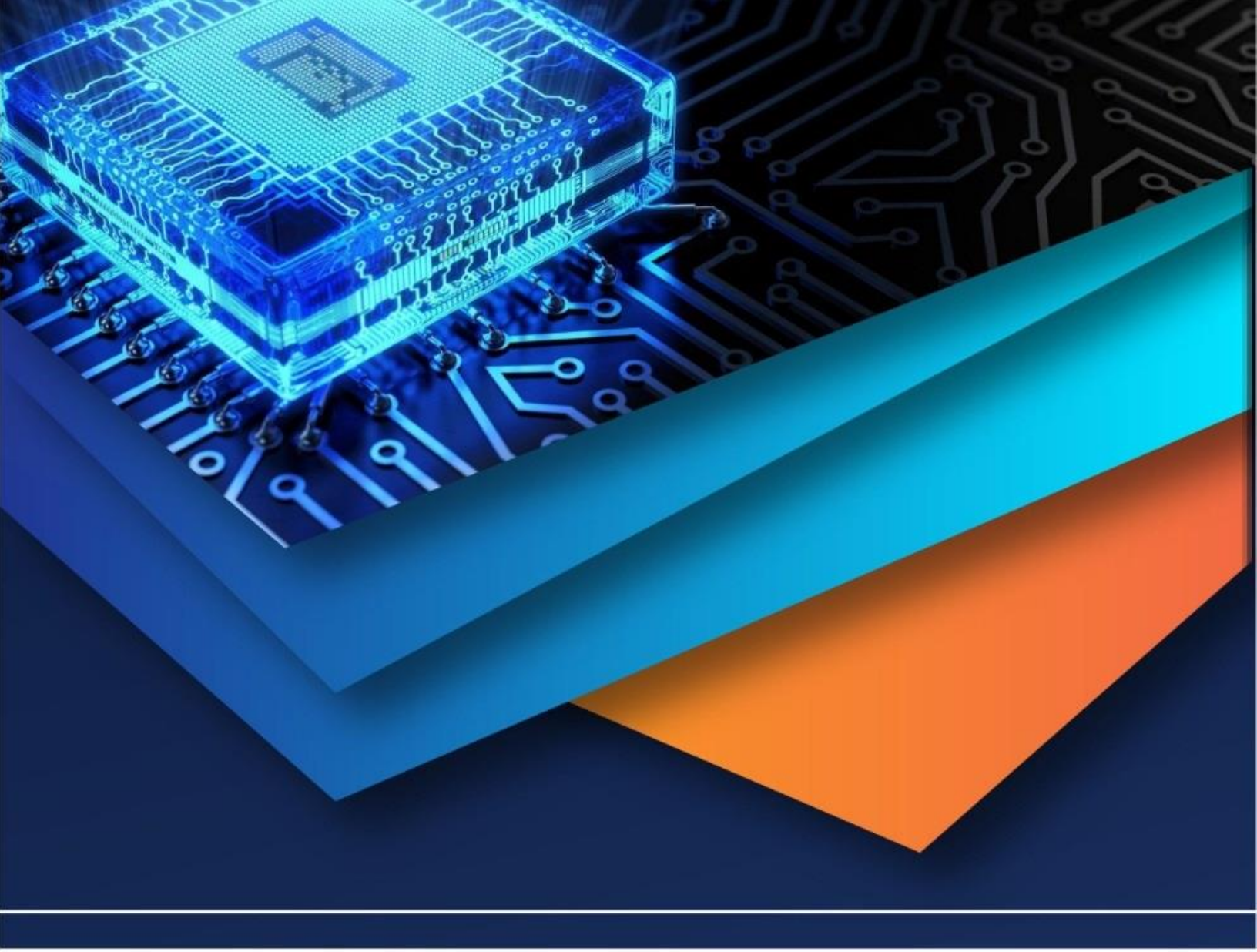
REFERENCE

[1] Mukesh Prasad, Atma Ram, " Smart Stick for the Blind and Visually Impaired People",Proceedings of the 2nd International Conferebce on Inventive Communication and Computational Technologies(ICICCT 2018) IEEE Xplore, 2018

[2] Himanshu Sharma, Meenakshi Tripathi, "Embedded Assistive Stick for Visually Impaired Persons", IEEE Xplore, 2018

[3] Ashwini B, Leena Bindal ," Design and Development of Smart Assistive Device for Visually Impaired People", IEEE International Conference on Recent Trends in Electronics Information Communication Technology, May 20-21,2016

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)