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# THE THIRD EYE

**Anand Kumar Maurya, Divyanshi Sharma, Adarsh Pandey, Anshu Pal and Ravi Srivastava**
anandmourya1997@gmail.com, divyash1707@gmail.com, pandeykavi675@gmail.com, palanshu610@gmail.com, rkravi007@gmail.com
Department of Electronics & communication,
United College of Engineering and Research,
Prayagraj, Uttar Pradesh, India

***ABSTRACT*:-** This project describes ultrasonic blind walking stick and wearable gloves with the use of Arduino. According to who, 30 million peoples are permanently blind and 285 billion peoples with vision impairment. If you notice them, you can very well know about it they can't walk without the help of other. One has to ask guidance to reach their destination. They have to face more struggles in their life daily life using this blind stick, a person can walk more confidently and freely. This stick detects the object in front of the person and give response to the user either by vibrating or through command and also senses water and fire nearby them. So, the person can walk without any fear. This device will be best solution to overcome their difficulties.

*Keywords*: Arduino, wearable gloves, smart stick, ultrasonic sensor, water sensor, IR sensor, buzzer, LDR, voice playback, led.

## I. INTRODUCTION

Visually impaired have difficulty to interact and feel their environment. They have little contact with surroundings. Physical movement is a challenge for visually impaired persons, because it can become tricky to distinguish obstacles appearing in front of them, and they are not able to move from one place to another.

They depend on their families for mobility and financial support. their mobility opposes them from interacting with people and social activities. In the past, different systems are designed with limitations without a solid understanding of the nonvisual perception. Researchers have spent the decades to develop an intelligent and smart stick or wearable device to assist and alert visually impaired persons from obstacles and give information about their surroundings. Over the last decades, research has been conducted for new devices to design a good and reliable system for visually impaired persons to detect obstacles and warn them at danger places.

Smart walking stick and wearable glove is specially designed to detect obstacles which may help the blind to navigate care-free. The audio messages will keep the user alert and considerably reduce accidents. This system presents a concept to provide a smart electronic aid for blind people, both in public and private space the proposed system contains the ultrasonic sensor, water sensor, voice play back board, Arduino UNO, Arduino NANO and speaker. the proposed system detects the obstacle which are present in outdoor and indoor with the help of an ultrasonic sensor. When any objects or obstacles come in range of an ultrasonic sensor it notifies the person by buzzer sound and vibration.

# II. LITERATURE SURVEY

In the past few years, there has been innovations and development of various techniques and devices or gadgets guiding visually impaired people, thus towards attaining their independent or free movement around the surroundings without any other individual's support. Few parameters are there but they are having some limitations and restrictions.

D. Dakopoulos, N.G. Bourbakis: "Wearable obstacle Avoidance Electronic Travel Aids for Blind; A Survey" proposed that a relative survey among mobile obstacle detection systems in order to inform the research community and users regarding the abilities of this project and regarding the innovation in adaptive technology for the sightless people. This study is based on different attributes and performance specification of this system that arranges them in categories, offering quantitative-qualitative analysis.

M.A Ungar S: He proposed methods for the unsighted people of urban areas. But they didn't consider the people who cannot afford equipment of high cost. This drawback overcomes in Third eye for blind.

Ms Pooja Sharma: She analysed those objects can be detected, but there are drawbacks in terms of angles and distance. On the other hand, third eye for blind has a wide angle for the detection which can be widened with respect to the range of the sensor.

Hugo Fernandes, Joao Barroso: "Blind Guide: an ultrasound sensor base body area network for guiding blind people". The research introduces supportive formula for sensing obstacles for the sightless persons who generally take help of white-cane or the pet dog, thus for the detection of obstacles by using this device provides a proper solution to the blinds. Based on the Body Area Network of ultrasonic sensors that generate sound-based response, this solution is given. The Body Area Network can be inserted inside cloth fabric, emancipating sightless person from utilizing the seeing-eye dog or that white-cane.

Today's Innovative world is providing many solutions to the visually impaired for example; white-cane having a tip for assisting the movement of the blind people. The cane has different types used in today's technological world in the form of white cane, laser cane and smart cane. Dogs trained for this purpose are too expensive and unaffordable for certain people. The study discovered that the remote guidance system being very hard to move hence this device will act as most optimized version.

This vibration sensor, buzzer, LED's, ultrasonic sensors all are connected to the Arduino board. The connections are established with the help of soldering.

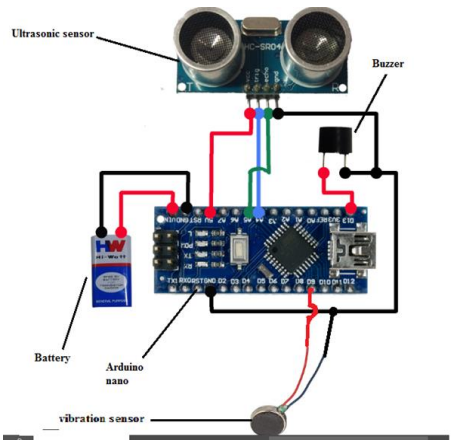


Fig.1.1 Design of gloves.

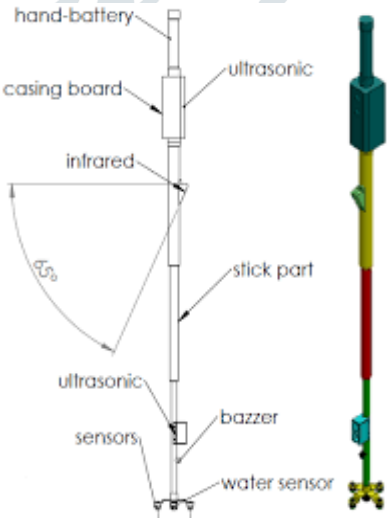


Fig.1.2. Design of smart stick

# III. PROPOSED WORK

The shape of the gadget that is to be worn like band and carrying a stick or we can say like a material by the blind person depends on a surprising wearable gadget in light of the Arduino board. The project can be made by ultrasonic sensors, vibration sensor, IR sensor, water sensor, LDR, voice playback which is wearable on the hand of the blind people and holding of the stick.

A. Module 1-vibration mode
whenever the obstacle is nearer, it will be sensed by the module and a vibration along with the beep sound will be felt by the person which will help to traverse in a better way.

B. Module 2-Buzzer mode
It will produce a beep sound on sensing the obstacle and if the way is clear then it won't produce any sound.

C. Module 2-Ultrasonic sensor mode
It will detect the nearby object and notify the person which him help to travel confidently.

D. Module 3- IR sensor mode
It is very sensitive to the heat and can detect the heat from long distance. If the sensor detects the heat radiation it will send an electrical signal to the controller and thus buzzer sound will be sent to person.

E. Module 4- Water sensor mode
A water sensor is located at the base of the stick to have precaution against the wet surface which it can causing slipping on the floor and thus can hurt. When the water sensor comes in contact of the wet surface, it produces an electrical signal which trigger the Arduino controller. A buzzer is enabled for alarming against a wet floor.

F. Module 5- LDR sensor mode
Light Dependent Resistor, 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.

# IV. WORKING

To make the life easier of blind people this system consists of wearable gloves as well as stick to navigate the freely and confidently. Smart stick senses the lower object nearby object to the blind people whereas gloves sense the object which are above the height of the stick and notify them with vibration sensor.

The wearable gloves consist of the equipment like Arduino NANO, ultrasonic sensor, vibrating sensor, perf board or zero PCB for detecting the obstacles and letting the user know about the obstacle, Jumper cable, battery, Male and female header pins, to make the device wearable as a band or gloves for wearing for the users. The connections of this gadget are developed as follows

The –ve terminal of led, buzzer and vibration sensor are grounded with the ground of Arduino. Led +ve terminal, central terminal of switch is linked to pin number 5 of the Arduino. The buzzer's +ve terminal has to be connected to the switch's 1st terminal and +ve terminal of the vibration motor is connected to the switch's 3rd terminal.

Now the connection of ultrasonic sensor module is that The VCC pins of both the sensor module and the Arduino are connected and also the GND of both are connected respectively. Trig pin of ultrasonic sensor and pin no 12 of the Arduino are connected together. The echo pin of ultrasonic sensor is attached to the pin no. 12 in the Arduino. A switch is connected which is used for the selection of mode i.e., buzzer mode or vibration mode.

The people who are visually impaired need a tool to guide their way to do the activities. Smart blind stick for the blind and visually impaired are one of the most important identification and mobility aids for this kind of people. There are a lot of blind stick that are already available in the market, but unfortunately there aren't many variants, especially the stick that can determine the day and night and the obstacles in their path. The Ultrasonic and LDR sensor are used in this smart blind stick. This sensor is connected to the Arduino microcontroller and the buzzer also connected. The buzzer is used to make sound when the blind near any object and it measure the distance between the object and the blind person. During night or blind people in the darkness the buzzer will alarm.

The smart stick notifies the blind people when there is water around him, the stick consists of water sensor which is connected to the Arduino. It senses the water and notify him with the buzzer sound. The stick also comprises of IR sensor which is connected to Arduino board, the IR senses the heat or any flame near to the blind people and revert the information with a different buzzer sound to the blind people.

# V. BLOCK DIAGRAM

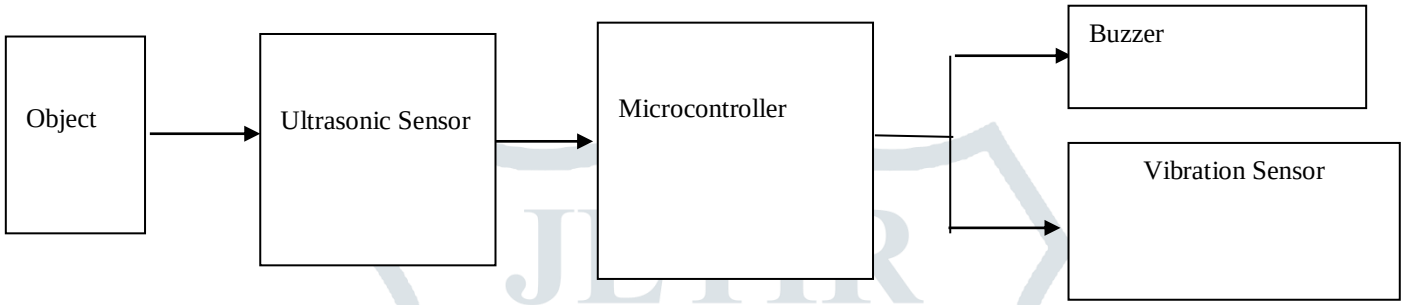


Fig 1.3. Block Diagram of Wearable gloves.

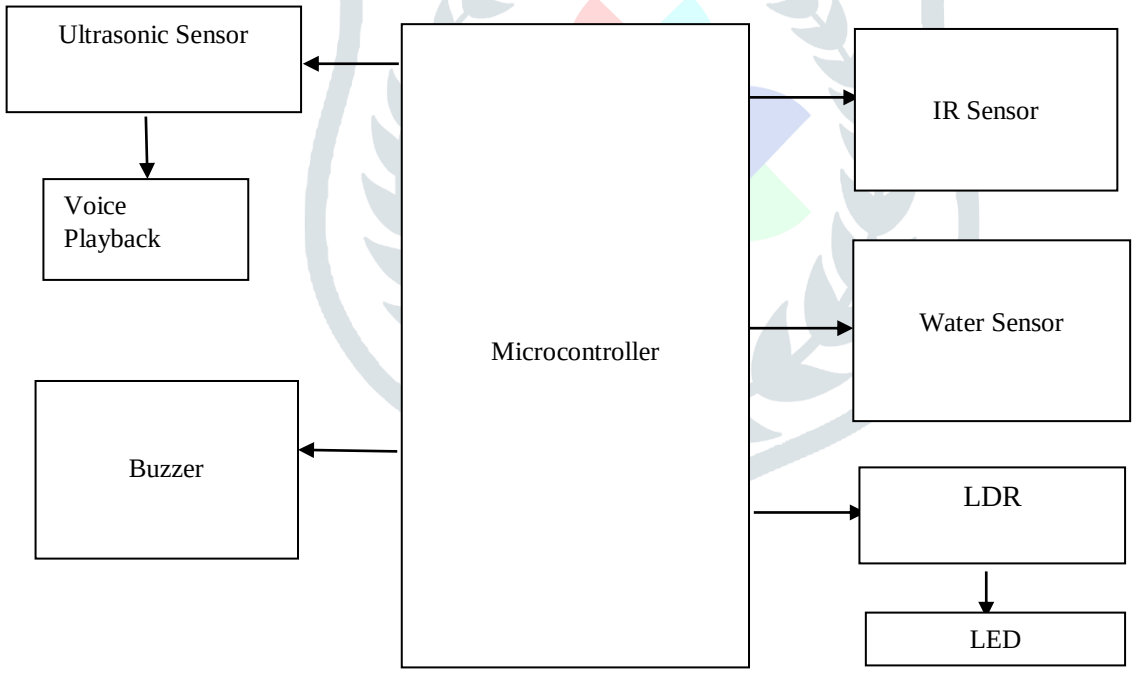


Fig 1.4. Block Diagram of Smart Stick.

# VI. RESULT AND DISCUSSION

The system is created and designed for visually impaired people. This device helps the visually impaired people to handle several states and responds to the user in every environment. All the conditions can be easily met by the blind individual using ultrasonic sensor, IR sensor, water sensor, LDR, voice playback, buzzer and the Arduino board. This device will help the visually impaired people to know about the obstacles in every direction.

## VII. CONCLUSION

Thus, the project, Third Eye for blind people is made sightless individuals to live independently, so as to perform their daily activities easily and more confidently with high level of safety. This Arduino based concept for the blind people is simple, cheap and can be easily carried and maintained. This system is able to scan and detect the hindrances in all directions irrespective of the height or depth the object lies at. With this project, if the construction is done properly, the blind can enjoy the taste of sight and can move freely from one place to another without assistance of the other individual.

## VIII. FUTURE ENHANCEMENT

The entire project can be made so that the device can be charged by the walking of the blind people. So that the device doesn't need any external power supply to run the device. Use of specially designed boards instead of Arduino and high-quality ultrasonic sensors makes faster response which make the device capable of working in crowded.

## IX. REFRENCE

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