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# VOICE ASSISTANCE SMART BLIND STICK

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**Abstract**: Technologies are growing very fast, which helps people to get easier life. The voice assistance smart blind stick is a technique to help blind people to recognize their path. Blind people suffer from the lack of ability to do their daily activities, from walking in the road for doing any daily things. Therefore, the solution for this problem is by designing a voice assistance smart blind stick that can aid the person to walk safely to reach the source to destination without having any fear of hitting someone on the way or any objects. The voice assistance smart blind stick has been designed using solid work software. In this work used three ultrasonic sensors. One sensor has been placed in front of the stick and the other two have been placed on both sides, left and right. To detect the motion from almost every side.

**Keywords**: Smart Walking Stick, Ultrasonic Sensor, Mini DF Player

## I. INTRODUCTION

In the whole world people are facing many psychological and social challenges in their life. One of the major issues is related to their transportation from source to destination. They are suffering with identifying obstacle in their path. Many researchers focusing to develop the module or aid voice assistance smart blind stick for supportive the blind people and it should be cost effective. Hence, this work aims to provide the cost effective solution to the blind people.The system designed will detect an object or obstacle using ultrasonic sensors and provides audio instructions for blind persons. An obstacle as close to minimum 100 meter distance can be detected by this module. A resolution of obstacle distance has been designed and achieved. It is very important to maintain efficient information while traveling to the blind people. This system has been amid at design and development of smart blind stick which helps in navigates the blind person. This work will detect an object or obstacle using three ultrasonic sensor and gives audio instructions for guidelines. The signals from the ultrasound sensor are processed by a microcontroller in order to identify sudden changes in the ground gradient and/or an obstacle in front. The algorithm developed gives a suitable audio instruction depending on the duration of ultrasound travel. We developed this system to detect the obstacle while travelling and give voice notification to visually impaired people.

## II. LITERTURE SURVEY

In [1] this paper presents the smart walking stick based on ultrasonic sensors and Arduino for visually impaired people the system was designed, programmed using c language and tested for accuracy and checked by the visually impaired person. This device can detect obstacles within the distance of about 2m from the user. Ultrasonic sensor, Arduino atmega328 microcontroller, mobility aid, visually impaired person, alarm.

In [2] the smart blind stick is based on sensors and microcontroller. The features considered are detection of obstacles near the stick and alert them back using Arduino Mega 2560, ultrasonic sensors, IR sensors, and buzzer. It has a low cost, simple and lightweight system design. By using these sensors and microcontroller, sensors sense the distance between obstacles and the blind stick and then alert with the buzzer where the frequency of vibration indicating the proximity of obstacle

| Author | Paper | Components | Applications/Remarks |
|---|---|---|---|
| Jismi Johnson, Nikhil Rajan p [3] | "Smart Stick for the Blind" | IR sensor, Ultrasonic sensor and Water sensor | This system just gives an alert if any one of the sensor is triggered, it uses a buzzer to alert the blind person |
| Amy Nor drum [4] | "pothole detection for blind" | Camera, Image processing | A camera that captures images15 frame per seconds and based on the |

  

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| | | | |
|---|---|---|---|
| | | | concept of image processing the pothole is detected |
| V .Dian Earshia, S. M Kalaivanan[5] | "Wearable ultrasonic obstacle sensor for visually impaired" | Ultrasonic sensor, Goggle | This project can detect the intruder in front of the blind person who is wearing the goggles |
| Kunja Bihari Swain, Rakesh Kumar Patnaik [6] | "Arduino based automated stick guide for a visually impaired person" | Arduino, Ultrasonic sensor | The designed blind stick working efficiently with a low power rechargeable |
| Jayakumar, S. Mahesh [7] | "smart walking stick for visually impaired people" | Ultrasonic sensor, Humidity sensor, Temperature sensor, GPS, GSM | GPS is used to track the blind people path and emergency conditions are transmitted to the neighbor through GSM based alarm system |

## III. COMPONENTS

- **ARDUINO NANO PRO MINI**:

The arduino nano pro mini is similar to arduino board but it is small in size it is based on ATmega328p or microcontroller. The connectivity and functionality of arduino nano pro mini are same as other arduino board. It is preferred by advanced users for greater flexibility and small size

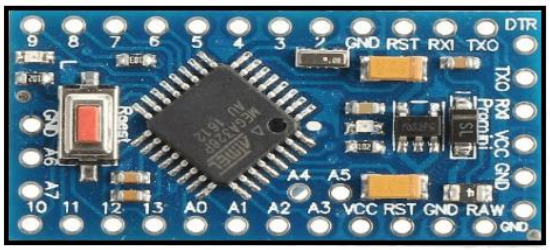


Fig. I: Arduino Nano Pro Mini

- **HC-SR SENSOR**:

HC-SR Sensor means ultrasonic sensor. This is a four pin module the pin names are Trigger, Echo, VCC, Ground. This sensor is frequently used in a range of applications that required distance measurement or object or obstacle detection. Two eyes like projects on the front of the module constitute the ultrasonic transmitter and receiver.

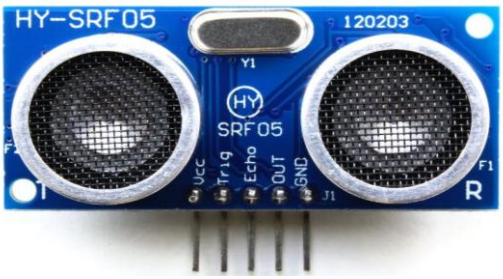


Fig. II: HC-SR Sensor

- **MINI DFPLAYER**:

The DF player mini is a small and low-cost MP3 module player with a simplified output directly to the speaker. The module can be used as a stand-alone module with an attached battery, speaker, and push buttons or used in combination with an arduino uno or any other with RX/TX capabilities

It perfectly integrates the hard decoding module, which supports common audio formats such as MP3, WAV, and WMA. Besides, it also supports TF card with FAT16, FAT32 file system. Through a simple serial port, you can play the designated music without any other tedious underlying operations.

  

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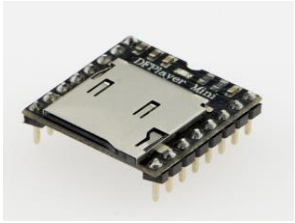

Fig. III: Mini DF Player

**CIRCUIT DIAGRAM:**

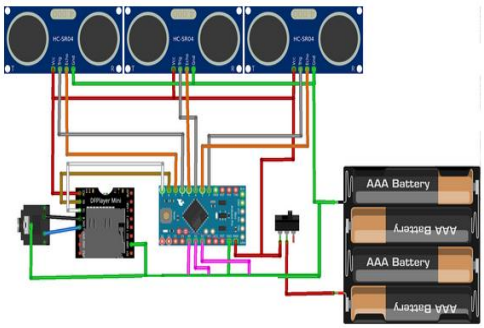


Fig. IV: Circuit Diagram of Smart Blind Stick

Circuit diagram three ultrasonic sensor and one min DF player, one arduino nano promini board and for power supply uses battery. Ultrasonic sensor 1,2 and 3 the ground is connect to power supply that is battery. All three ultrasonic sensor VCC is connected to Vin in Adriano pro mini and also connect to VCC in DF player. Ultrasonic sensor the trigger 1 connect to arduino pro mini pin no. 6 and trigger2 connect to pin no. 4 ,trigger 3 connect to pin no. 2Echo is connected to pin no. 7 and pin no. 5, pin no. 3.

**FLOW CHART:**

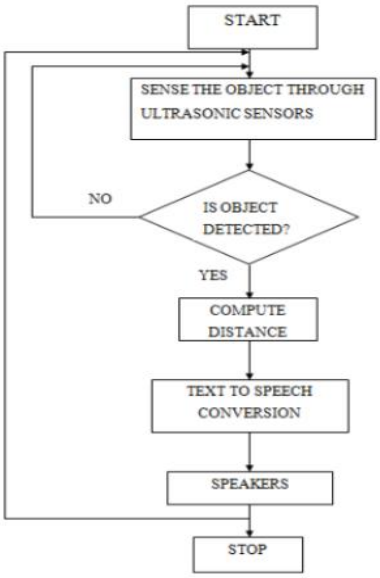


Fig. V: Flow Chart of Blind Stick

The flow chart, shows supply power to the top of the button in the blind stick if the object is sense through ultrasonic sensor then it checks object is detected or not. If object is detected then it computes the distance. Then it converts in to text to speech through speakers or head phones. If object is not detected it does not send the voice to speaker

  

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## IV. RESULTS AND DISCUSSION


Fig. VI: Full view of Smart Blind Stick

The stick having three ultrasonic sensor one front, one left and one right through this it detects the object and send voice through mini DF player to headphone. By using headphone the blind person hear the voice. The voice message is like obstacle 20 cm front, right, and left. The minimum distance to detect the object is 100 cm.

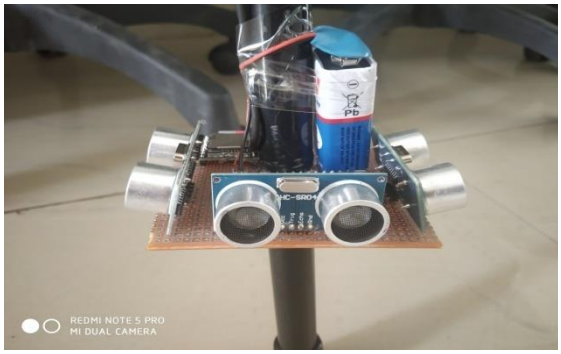


Fig. VII: Ultrasonic Sensor connection

The front view of the smart blind stick it detects the object minimum 100 meter distance and sends voice to head phones like 20 meter the object is ahead , Left, Right.

## ADVANTAGES

1. Navigates the directions for the blind people
2. Help avoid the accidents for blind people
3. Easy to carry

## V. CONCLUSION

The blind walking stick was turned into a product that can be used to guide the blind peoples. The aim to solve the problems that blind people face in their everyday lives. The main purpose is to develop a prototype in the forms of voice messages that can detect objects or obstacles in front of users and feeds alarm back. Targets people with disabilities who are blind to encourage movement and improve health. The accomplished using ultrasonic sensor and voice module to complete the design to investigate the nature of the smart blind handle. Allow people with disabilities to move around freely. The initiative work to help all of our country's blind people make it easier for them to travel wherever they wish. This model provides a low cost, reliable, compact, low-power consumption and robust navigation solution with obvious short response time. The device with sensors and other components is hard-wired, it is light in weight. Additional aspect of this work in order to run this integrated set of hardware this work can use solar panels as

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an alternative to the battery. The use of solar panels occurs to be more advantage as it uses sunlight, the easily available renewable resource of energy, to get recharged.

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