

Arduino Powered Obstacles Avoidance for Visually Impaired Person

Ms. A. Aruna¹, Ms.Y.Bibisha Mol², Ms.G.Delcy³ and Dr.N.Muthukumar⁴

^{1,2,3}UG student, Francis Xavier Engineering College, Tirunelveli-627003, Tamilnadu, India.

⁴Professor, Francis Xavier Engineering College, Tirunelveli-627003, Tamilnadu, India.

Email: arunaanjana957@gmail.com¹, bibishamol25@gmail.com², delcysekar11@gmail.com³, kumaranece@gmail.com⁴

Article Received: 24 January 2018

Article Accepted: 27 February 2018

Article Published: 08 April 2018

ABSTRACT

The main theme of the paper is that we want to save the blind people life and they have to move their life as normal as the other people live. So, we introduce our concept which is a shoe module. Normally human beings use shoes for their daily life. We introduce a concept of finding the obstacle by using Arduino. In general, blind people want a support to walk. So, they wear shoes and have a cane. Arduino board is attached to the shoe and in cane. If any obstacle is present in front of the visually impaired person it can be detected by the shoe with the help of Arduino and if any staircase or other natural activities like running of water or any stagnant water is present in front of the blind person, it can be detected by the cane with the help of ultrasonic and TSOP sensor and also with the rain drop detector. By using this method the blind person can live happily without any distractions and problems.

Key Words: Arduino UNO, Ultrasonic Sensor, NRF Module, TSOP Sensor, Buzzer, Vibration Motor.

1. INTRODUCTION

In this modern world, people live their life's happily. The daily needs can be satisfied with the help of modern environment. People with any defects can be solved and it does not have more pain to their regular life. But blind lines is one of the problem. Due to that they lack their happiness. So, we introduce a technology. "Modern Technology" is our technology with the modern and well equipped instruments and equipments. The blind people can regain their life with the help of our technology. Arduino process can be implemented in our concept in the way of generating a shoe module.

Shoe module consists of ultrasonic sensor which helps to detect the obstacle in front of the user. The Nordiac radio frequency is used to receive the signal from the obstacle and it is given to the buzzer. Cane is also used in our method which is also used to detect the obstacle by ultrasonic sensor and TSOP sensor and the rain drop that is the stagnant water can be detected by using rain drop detector and NRF receiver is used to get the signal from the shoe and finally the vibration motor gets vibrated and the buzzer gives alert to the blind person.

The respite of this paper structured as follows. In section 2, the classification of proposed algorithms for solving the networks concern. Experiment consequences and discussions described, In section 4. Finally, the conclusions and further improved are given in section 5.

2. PROBLEM STATEMENT

In reviewed projects they have used shoe and cane. But the implemented process is in separate way. They have used the application like bluetooth device. The process which is used in the device is somewhat difficult. The pairing is more difficult if the connection gets disabled then the regaining process of pairing is more difficult. They

used infrared sensor which has the coverage range upto limited area. If it is used then the process require more than one infrared sensor. It leads to expensive cost. The above reviewed papers has more limitations like detection of water. If any running water or water get stagnant in a place it cause a problem to the blind person and staircase is found in many place. It is the major obstacle in many places for the blind person. It cannot be detected by the above reviewed papers. RFID tags are used in the reviewed papers. There they have a concept that the tags are placed in many places. If the cane is used in the way if RFID tags are placed they have the signal and it gets starts working. If RFID tags are not present then the cane does not work. It is one the major problem.

3. PROPOSED SYSTEM

In our project we have the proposed idea that we have two module. One is shoe module and the other one is cane module. Cane module is the primary module and shoe module is the secondary module two have combined these two modules. NRF module can be easy to transmit the signal. Our system has used to detect the water by the rain drop detector and other obstacles like staircase detection can be identified.

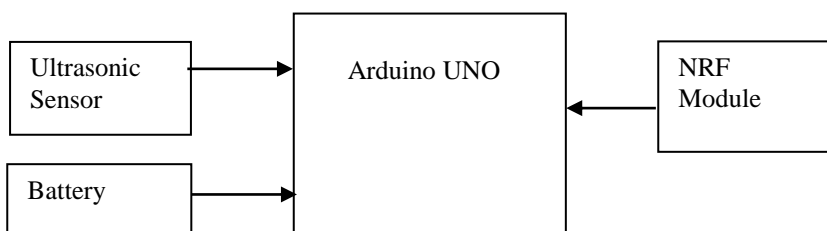


Fig.1 Block diagram of Shoe Module

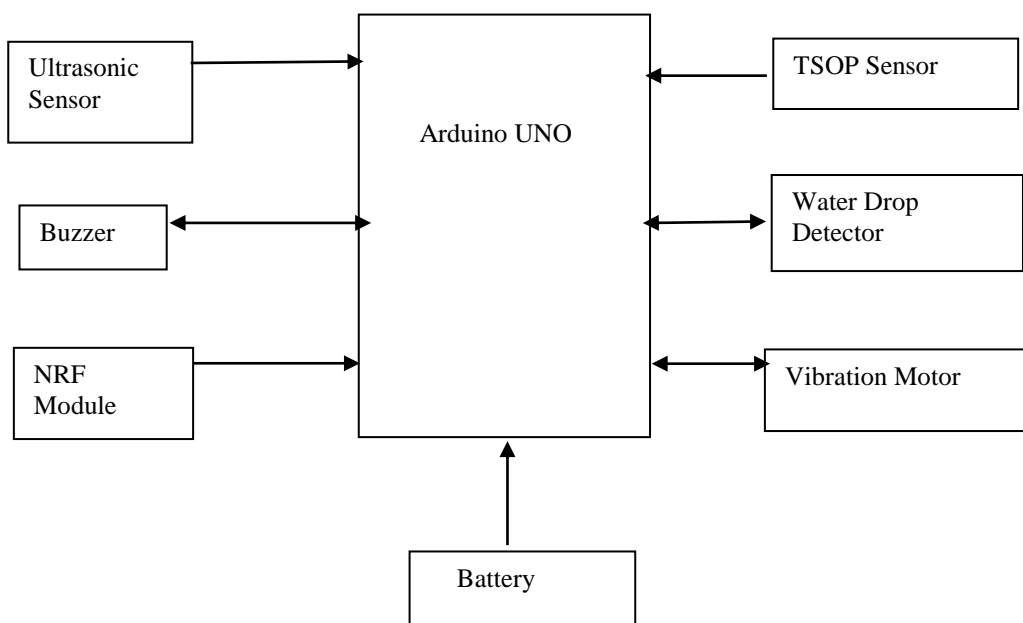


Fig. 2 Block diagram of Cane Module

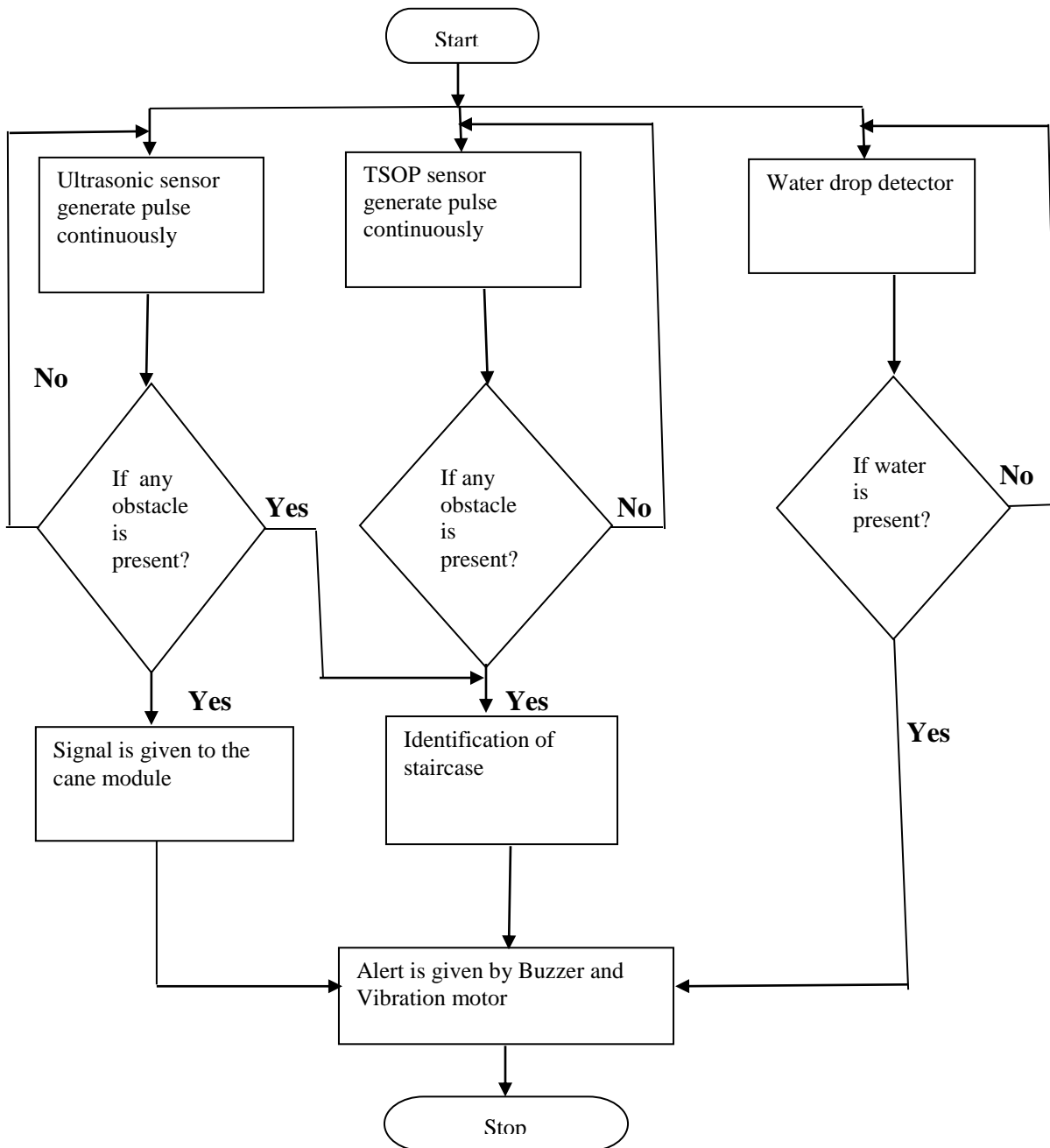


Fig.3 Flow Chart

In this flow chart, Ultrasonic sensor generate pulse continuously if any obstacle is present in front of the sensor then the signal is given to the cane. Simultaneously the buzzer sound is produced. Ultrasonic sensor generates the pulse continuously along with the TSOP sensor sensing. The time delay between the ultrasonic sensor and TSOP sensor is identified as 'Staircase'.

Then the buzzer sound is produced and vibration motor gives alert to visually impaired persons. If a drop of water is detected by the water drop sensor, then the buzzer sound is given to blind person. If it is not detected then the above detection process will be continued.

4. RESULT AND DISCUSSION



In Shoe Module ultrasonic waves are coming out of it continuously. If any obstacle is present in front of the shoe, the ultrasonic sensor senses the signal and transmit it to NRF module. Then the NRF transmitters transmit the signal to the NRF receiver which is placed in the cane.



Cane receives the NRF signal, automatically it sends the signal to the buzzer and it will turn on along with the buzzer sound, vibration motor gives its own vibration alert to the visually impaired person. TSOP sensor is placed in the bottom of the cane it transmit the signal simultaneously with ultrasonic waves.

If any staircase is found in front of the sensor it gives alert to the blind people by giving continues buzzer sound along with the vibration alert.

5. CONCLUSION AND FUTURE ENHANCEMENT

Thus the system will detect the obstacles in front of the person and also it indicates to the person about the obstacles. We just conclude by saying it proves to be a boon for the blind person and eliminating the dependency of them. Thus we are making the blind people independent in this world.

In further implementation process, we have to implement the embedded systems and digital image processing together. Digital image processing is used to identify the top to down process staircase and other slopes or hilly areas.

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