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Navigation System for Blind People

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***Abstract*: There are many blind people around us which find difficulties in their daily day life. One of them is movement from one place to other. They face more problems while moving from one place to another. So, here we built a system that will help blind people for navigation and will ultimately reduce their daily day life difficulties. The features of the systems are obstacle detection and navigation. For obstacle detection we have used ultrasonic sensors and for navigation we used RFID. And according to location the instruction will be given to the blind person in the form of voice output. So, main aim of system is to help blind people while moving from one place to other.**

***Keywords*: Navigation, Obstacle detection, RFID Tags, Ultrasonic sensors.**

1. Introduction

We can't imagine the life of a blind person, that person have never seen how the world look like and what are the things in the world. And he or she (the blind person) can't see the beautiful world. But blind person can't move from one place to other without any help e.g. wooden stick, guided dogs or some assisting people. So, we have to find some helpful solution for the blind people. According to survey of WHO (World Health Organization) 39 million peoples are blind all over the world. About 90% of the world's visually impaired people live in low income conditions [1]. They can't afford organ transplantation expenditure due to low income source. So here we are doing small effort to make their life easy. Traditionally the blind people were using wooden stick and now a day's also many blind people are using it. It is simplest way use for navigation. The wooden stick helps to detect the ground level obstacles. But its range is too short and the blind person has to be very careful while walking. And that person has to take care of sudden slope, ravine, moving obstacles. Wooden are less expensive, lightweight, and detect the obstacles on the ground level. We all know that blind persons find difficulties in navigation i.e. moving from one place to desired place. For guiding blind person, we need to face main three problems a) Where is person, b) where does the blind person want to go, c) How does the blind person will reach there? [2] These are the main problems while designing the navigation system for the blind people. Guide dogs are also used for assisting blind and visually impaired person. These guide dogs help to avoid the obstacles in their movement path. But this method is little bit expensive, because guide dogs need proper training. And this is very challenging task.

2. System description

This system proposes the navigation for blind people which uses the wireless technology i.e. RFID and this system also detects the obstacle in path of the blind person.

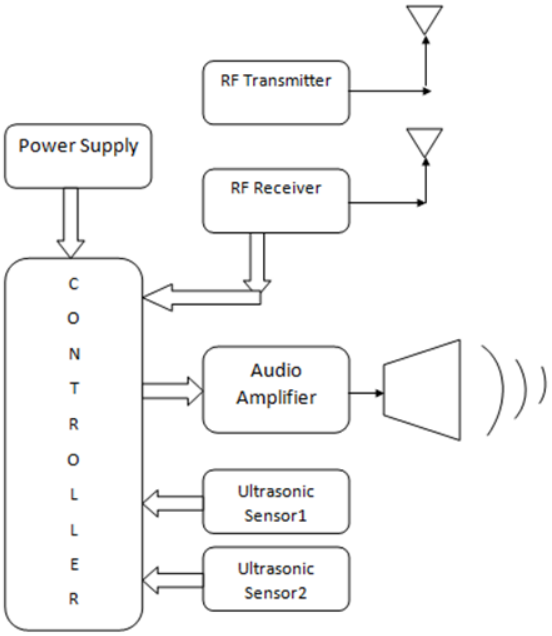

Fig. 1. System block diagram

The figure shows the system block diagram which consist of, microcontroller, RFID transmitter and receiver, ultrasonic sensors, audio amplifier and speaker. The ultrasonic sensors are used to detect the obstacles in front and side also. This sensor can also measure the distance between blind person and the obstacle which is best thing of this system [3]. And audio is played whenever there is obstacle in the path.

Every location and path has RFID tag attached, which gives location and direction to blind person in the form of audio playback. There are so many tags are place in different locations and different paths. So, with the help of these the blind person can easily move from one place to other place. This paper has made simple step towards helping the blind people.

A. Flowchart

The system starts with readings taken by the ultrasonic sensors and RFID receiver. After taking data from sensors, microcontroller will process on it. It will find what action should be taken based on the input data.

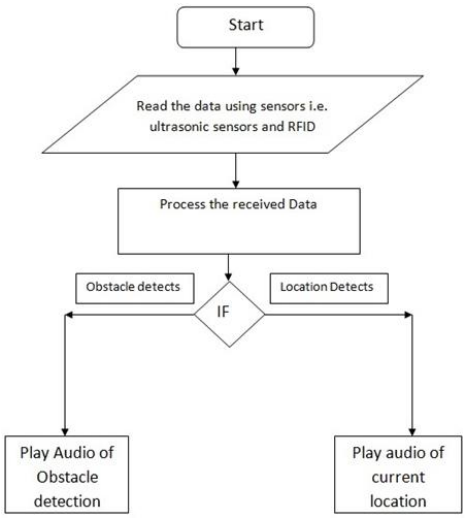

Fig. 2. Flowchart

For ultrasonic sensor, the input is distance travelled by the rays from the sensor to obstacle (if any) and obstacle to the sensor. So, the controller calculates the distance from the obstacle and ultimately gives output (warning) in the form of audio [4].

When a blind person travels along the path, he will get updates of locations. So that person can easily go wherever that person wants. The blind people will find free to move inside the building area. This is all about workflow of the system.

3. Results

This system gives output in the form of voice (audio) which contains some instructions, warnings and information. After testing the system, the results are the detected obstacle, detected location and guidance provided to the blind person. We have put some obstacle in the path and travelled with the system, and system has successfully detects the obstacle. Our system also detects the RFID tags location. The system gives efficient audio output.

4. Conclusion

This paper proposes the system that helps the blind person to overcome their daily day life difficulties. This system takes care of their safety and effective movement. The system uses the ultrasonic sensors for obstacle detection. As our system will give early warning of obstacle in path it is more helpful than other technologies. And navigation is done using RFID technology as it will give you the current location, all information about that place and place nearby it i.e. forward and backward locations. All output is in the form of audio.

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