Research & Design of Smart Blind Stick

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Abstract –

This project describes ultrasonic blind walking stick with the use of arduino. according to who, many peoples are permanently blind and many of peoples have 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. this stick detects the object in front of the person and give response to the user either by vibrating or through command. so, the person can walk without any fear. this device will be best solution to overcome their difficulties

1.Introduction

Visually impaired persons 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 to assist and alert visually impaired persons from obstacles and give information about their location. 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 to danger places

Smart walking stick 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. A voice enabled

automatic switching is also incorporated to help them in private space as well. 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, raspberry pi and speaker. The proposed system detects the obstacle images which are present in outdoor and indoor with the help of a camera. The stick measures the distance between the objects and smart walking stick by using an ultrasonic sensor. When any objects or obstacles come in range of an ultrasonic sensor and it make buzzer sound.

2. Problem Statement

1. Blind people can't easily recognize obstacles or stairs while using normal blind stick .

2. No safety features on the normal blind stick

3. Can't locate the location of the normal blind stick user when they are having an emergency problem or lost

3.Objectives

1. To develop a prototype hardware for modern blind stick.

2. To help the blind people navigate the route at their best.

3. To reduce the risk of injuries and lost for the visually impaired person.

4. To creating a suitable software for the visually impaired person.

4. System Block Diagram
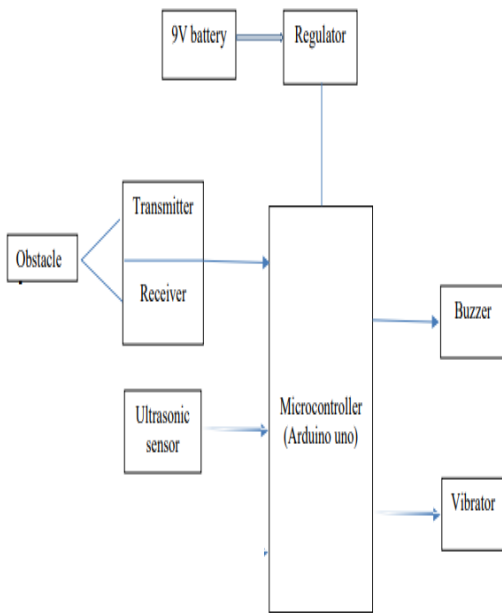
Block diagram

Arduino microcontroller is the key feature of this. The specific blocks connected to this device include an ULS, water sensor, buzzer, vibrator, IR screen An ultrasonic sensor for (if any) barriers is used in this system. The ultrasonic sensor can provide an extremely cost-efficient remote measuring device. Vibrator and buzzer run using the sensor data. Water sensor module for the identification of water and for the warning against water damage. On discovery of the stream, buzzer is triggered. Even supplying vibrator to show obstacles. The system has one more benefit. The blind person may sometimes lost his stone, or forget where he was put. To this end, it includes an IR board. The IR module is an electronic device that transmits and/or records two radio transmissions.

3.2 BlockDiagram Description

The microcontroller receives input from the sensors and GPS unit. The suggested device employs an ultrasonic sensor and has a detection range of a few met for any object

lying on the ground. The smallest thing that can be detected shouldn't be smaller

5. Hardware Requirements

1. ARDUINO-UNO (AT-mega238)

2. Relay (SRD 05-VDC)

3.LED

4.Buzzer 5V

5. Ultrasonic Sensor (HC-SRO4)

6. Switch

7. GSM(Global Station Mobile Senter)

8.GPS

6.Flowchart

Ultrasonic sensors first send waves to identify objects when the system is initialised, while moisture sensors are used to detect changes in the characteristics of the soil when there is wetness on the ground. When an item or body of water enters the sensor's field of vision, it determines if the distance is larger than the threshold distance or less, and if it is greater than the threshold distance, it alerts the user with a buzzer directs him appropriately. In case of emergency blind person could press the emergency button an can give location to there
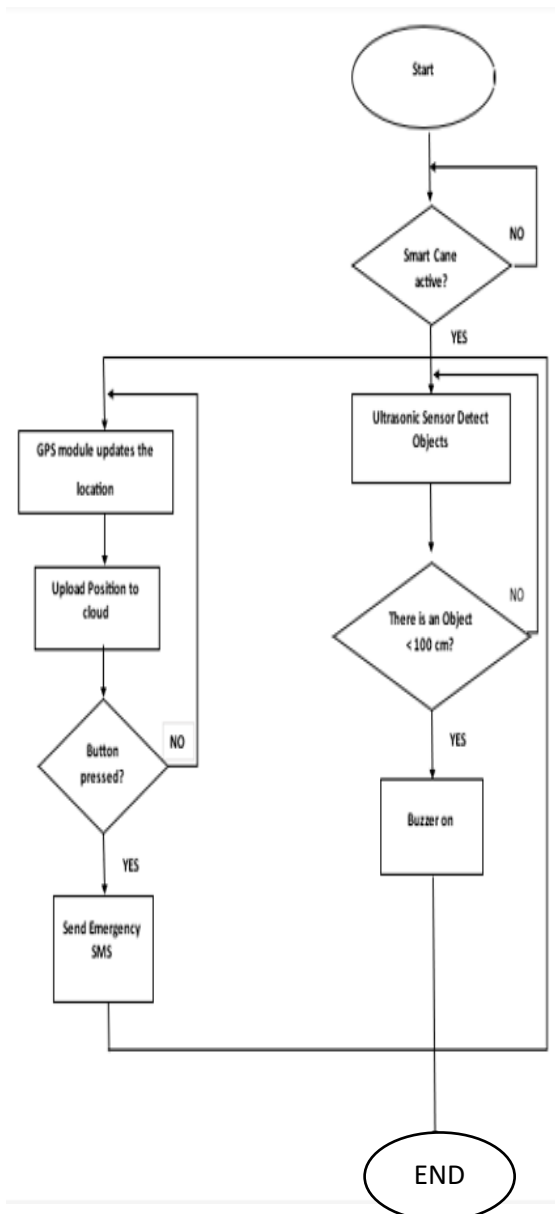
Fig 7.1 each component has a specific function and features the components are connected with jumper wires And soldering
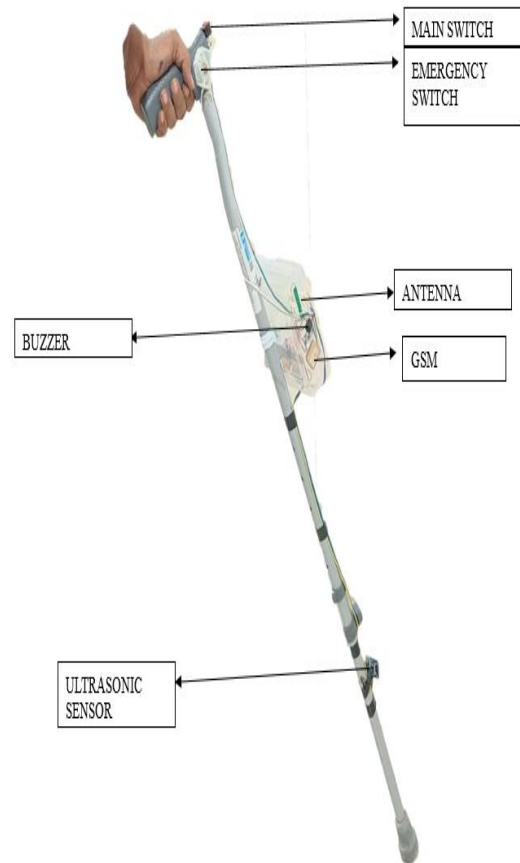

Fig 6.1 RESULT WITH SENSOR DESCRIPTION

Fig 7.1 Result with sensor description

7.Results

1. Result with Sensor description – here in this figure it shows the details about sensors and where it is located In this we designed a smart blind stick the components are mounted on stick and it is shown in below

2. Showing the hardware working –

In this figure we have shown the working of hardware when it uses
In this result we perform the testing of smart blind stick and we get the result as follows

a) buzzer produces beep sound when obstacle detect
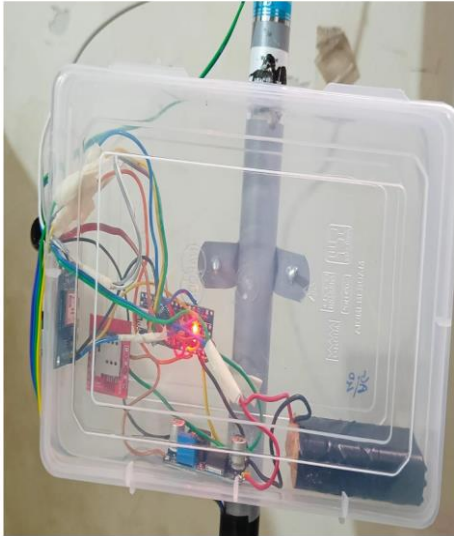
b) a message is received to guardian/ family

Fig 2. Showing the hardware working

3.Showing location message to guardian –

In this result here is a screenshot of shared location of blind person with help of Gsm

Gps module updates the location by transmiting signals it upload position to the cloud the emergency button is pressed by a person it will send emergency sms with live location to the local Guard
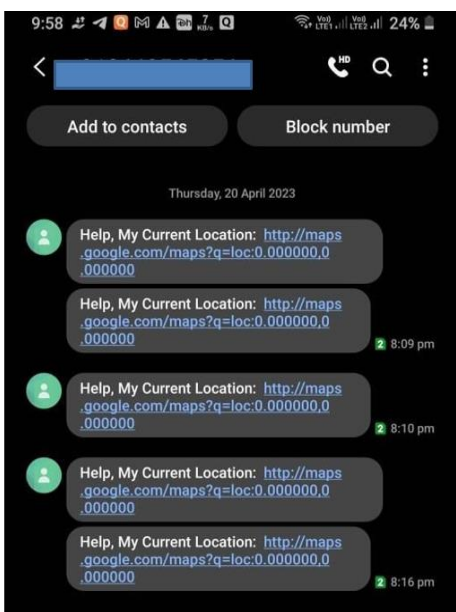

Fig 3.Sharing location

4.Showing location on Google Maps

In this result when we click the link on the message it redirect to google maps to show the exact location

1) after receiving the message from Gps – gsm model
2) the person need to click the link which is received on the message
3) it will redirect to the google maps for live location as shown in below figure

Fig 4. Showing Location

8.CONCLUSION

The Blind Walking Stick has been finally made into a prototype that can be used to guide the blind. It aims to solve the problems faced by blind people in their daily life. The system also takes the measure to ensure their safety. This project will help all the blind people in the world and make it easier for them to walk. It was done to help the blind move ahead very well. It helps to facilitate the movement ensuring safety. The smart walking stick, constructed with at most accuracy, will help the blind people to move from one place to another without others help. This could also be considered a crude way of giving the blind a sense of vision. This stick reduces the dependency of visually impaired people on other family members, friends and guide dogs while walking around. The proposed combination of various working units makes a real-time system that monitors position of the user and provides dual. The smart stick detects objects or obstacles in front of users and feeds warning back, in the form of voice making rather than vibration.

9. Reference

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