OBSTACLES DETECTOR FOR HELPING VISUALLY IMPAIRED

Monisa S[1], Rathi B[2], Seedhanadevi S[3]

[1,2] B.TECH(IT), [3] Assistant Professor, Department of Computer Science and Engineering

Sri Vidya College of Engineering & Technology.

monisasundar1995@gmail.com, bas.rathi18@gmail.com, seedhana1996@gmail.com

Abstract-

God gifted sense to human being which is an important aspect in our life is vision. But there are some people who lag this ability of visualizing these things. Visually impaired people face many challenges when moving in unfamiliar public places. Only few of the navigation systems for visually impaired people can provide dynamic interactions. Current navigation system focuses on designing a device for visually impaired people that help them to travel independently also it must be comfortable to use. The proposed device is used for guiding individuals who are blind or partially sighted. The device is linked with a GPS to identify the location of the blind person. Moreover, it provides the voice alert to avoid obstacles based on ultrasonic sensors. An emergency button is also added to the system. The whole device is designed to be small and is used in conjunction with the white cane

.

Keywords-*Ultrasonic sensor, Arduino UNO, Bluetooth module, GPS, Button, ear-phone.*

I INTRODUCTION:

Blindness or visual impairment is a condition that affects many people around the world. This condition leads to the loss of the valuable sense of vision. Worldwide more than 160 million people are visually impaired with 37 million to be blind. The need for assistive device was and will be continuous. There is a wide range of navigation systems and tools existing for visually impaired individuals. The blind person truly requirements and identifying objects.

a. Objective

The paper main objective is to provide a talkative assistance to blind people. We are going to develop a intelligent system that works efficiently good in both indoor and outdoor. Current navigation device for the visually impaired focus on travelling from one location to another. This focuses on designing a device for visually impaired people that help them to travelling independently also it must be comfortable to use. The proposed device is used for guiding individuals who are blind or partially sighted. Moreover, it provides the voice alert to avoid obstacles based on ultrasonic sensors. An emergency button is also added to the system. The whole device is designed to be small and is used in conjunction with the white cane.

b. Scope of the paper

The scope of this system is to develop a low-cost system that assist the blind and visually impaired without the help of sighted person. The system is a GSM-GPS based so that it takes the advantage of the GSM network such as the popularity and cost-effectiveness. Additionally, GSM-GPS module have been used in different areas of human activity, such as the navigation of vehicles and navigation aids to guide visually impaired pedestrian and let them to avoid obstacles and reach their destination. RFID is used in indoor to assist

the blind people since GPS cannot be used efficiently in indoor. Also we use GSM to send a alert message to the authorized person

II LITERATURE SURVEY

Blind and visually impaired people are at a disadvantage when they travel because they do not receive enough information about their location and orientation with respect to traffic and obstacles on the way and things that can easily be seen by people without visual disabilities. The conventional ways of guide dog and long cane only help to avoid obstacles not to know what they are. Navigation system usually consist of three parts to help people travel with a greater degree of psychological comfort and independence sensing the immediate environment for obstacles and hazards, providing information about the location and orientation during travel. Today in market different technologies like GPS,GPRS are used to navigate visually impaired people.

1)Guidance of dog: A specially trained dog assisting the blind in obstacle avoidance, but usually not aiding in way finding, e.g. the dog is trained to stop before obstacles, reacts to commands on walking directions. In spite of their great usefulness, guide dogs are a rarely used aid- only about 1% of the visually impaired use it.

Advantage: Good in following familiar paths, good overall obstacle avoidance, trained for selective disobedience when sensing danger to his owner.

Disadvantage: Very costly, guide dog service period in on average 6 years, regular dog up-keeping cost and lifestyle changes.

2) Human guide: A blind person walks hand in hand with a sighted guide.

Advantage/Disadvantage: The most obvious, but in practice not a permanent solution for aiding the blind in mobility
and navigation. A blind lacks privacy and can have a feeling of being a burden to his or her guide.

III SYSTEM ARCHITECTURE

TRANSMITTER:

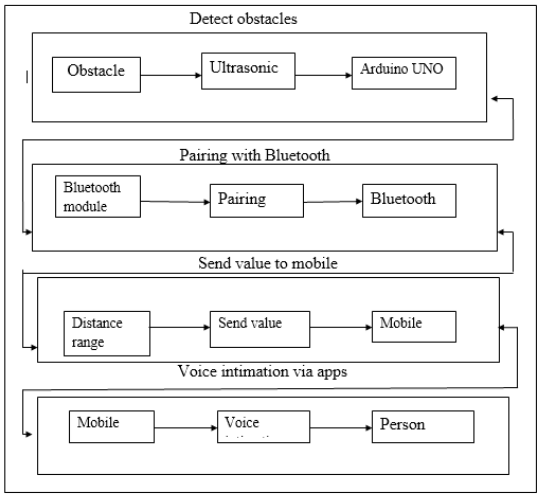

Fig 1. Blind app

RECEIVER:

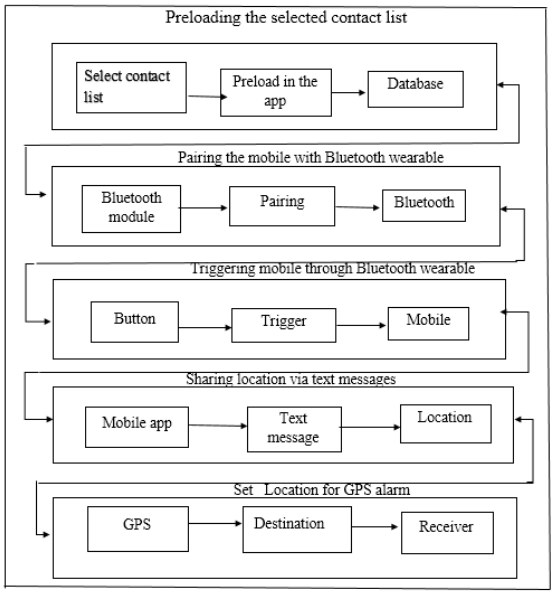

Fig 2. Alert app

IV PROPOSED SYSTEM

In proposed system to solve the problem faced by the visually challenged person, an application was designed to intimate the person about the obstacles. The ultrasonic sensor placed in the blind person stick helps to detect the distance and if the distance limits, it sends value to mobile by using Bluetooth sensor attached with the circuit. The application helps the person to move in a proper way through voice. The text to speech library file helps to convert the text to voice, which helps to intimate the obstacle in the path. The application developed to intimate about the current location to the respective person during any help or urgency. The contact number can be stored in the application and thus as soon as the person presses the button, the details of the current location will be sent to the respective contact details.

Advantage of Proposed System

- The smart phone helps the visually impaired person to notify the obstacles by voice.
- The person can get an alert to turn to the corresponding direction by predicting the distance.
- The person can move without the help of others to monitor the obstacles in their route.
- The sensor placed in the stick helps in detecting the obstacles therefore the person can easily move inside the home and their work can be out themselves without the help of others

V SYSTEM DESCRIPTION

Ultrasonic: Ultrasonic measurement principle The ultrasonic sensor radiates a pulse signal, ST to the object and then receives a reflection signal, SR back to sensor. The distance will be measured by calculating the reflection time interval between the target and sensor [15]. The ultrasonic measurement technique can be illustrated in

Distance=speed*time/2

Arduino: Arduino Uno is a single board microcontroller intended to make the application of interactive objects or environments more accessible. The hardware consists of an open source hardware board designed around an 8-bit Atmel AVR microcontroller or a 32 bit Atmel ARM. The Arduino board used for this purpose is to receive the input signals, and fingers on the button.

GPS: Earth has 24 GPS satellites, at least 4 are always visible. GPS receiver calculates location using triangulation method. 66 channel GPS receiver interfaced via NMEA protocol. The smart antenna can track up to 66 satellites at a time. Fast time to first fix, superior sensitivity and low power. Less than 10m accuracy. 57600bps UART interface. Up to 10hz update rate. Built in micro battery to preserve system data for rapid satellite acquisition. LED indicator for fix or no fix

Buzzer:

A buzzer or beeper is an audio signaling device used as a communication device like in alarm device, timers and confirmation of user input such as a mouse click or key stroke .Here buzzer is used as a communication medium so when an obstacle comes in front of the device it alert the user. In order to access the performance of gadget an experiment was carried out. This experiment was carried out on three visually challenged persons. And the evaluation was made by a National.

VI CONCLUSION

The app helps the visually challenged persons to give intimation, when the obstacles occurs in their path. Thus the application helps all categories of blind persons in an easier way to find path. The accident occurs for the visually challenged person can be limited and the application

can be implemented in a user friendly manner. The setting of ultrasonic sensor on three direction helps to predict the accurate way in a easy manner for the user and depending on others help by the visually challenged person can be reduced. At any emergency time, the user can send alert message to the respective contact numbers. The message alert contains the details of the longitude and latitude of the current location and thus emergency help can be taken in quick time

REFERENCE

[1] .Alshbatat, Abdel Ilah Nour. "Automated Mobility and Orientation System for Blind orPartially."INTERNATIONAL JOURNAL ONSMART SENSING AND INTELLIGENT SYSTEMS, 568-582, 2013.

[2] A. R. García, R. Fonseca. A. Durán. "Electronic long cane for locomotion improving on visual impaired people." IEEE, pp.58-61, 2011.

[3] Harshad Girish Lele, Viten Vilas Lonkar, Varun Vasant Marathe, Mrunmayi Mohan Modak. "electronic path guidance for visually impaired people." The International Journal Of Engineering And Science (IJES), 09-14, 2013.

[4] Lamya El alamy, Sara Lhaddad, Soukaina Maalal, Yasmine Taybi,Yassine Salih-Alj. "Bus Identification System for Visually Impaired Person." International Conference on Next Generation Mobile Applications, Services and Technologies, pp.13-17, 2012.

[6] Mahdi Safaa A., Muhsin Asaad H. and Al-Mosawi Ali I. "Using Ultrasonic Sensor for Blind and Deaf persons Combines Voice." International Science Congress Association, 50-52, 2012.

[7] M. Nassih, I. Cherradi, Y. Maghous, B. Ouriaghli and Y. Salih-Alj. "Obstacles Recognition System for the Blind People Using RFID." Sixth International Conference on Next Generation Mobile Applications, Services and Technologies, pp. 60-63, 2012.