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Survey on Route Finding Application for Blind People

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ABSTRACT: The navigation system aims at building the application which provides guidance for campus navigation and obstacle detection as well for blind people. The main purpose of this project is to guide blind people to reach from source to destination with shortest path. Our application is based on the concept of GPS which helps in navigating the path step by step through voice command. Along with this we are using ultrasonic sensor for obstacle detection. This system gets the information from surrounding area through mounted sensor on the android using the Bluetooth.

KEYWORDS: Navigation, obstacle, sensor, GPS, Application, Bluetooth.

I. INTRODUCTION

The objective of this project is to guide blind people with voice navigated GPS using an android phone. This application is an innovative and cost effective guide system for blind people. For blind and visually impaired people is quite impossible to be autonomous in the contemporary world, in which we are completely surrounded by information, but only visual information. When looking for a product in shops, or ordering at the restaurant, or when they want to listen to the music on a CD, blind person counter the visual barrier of the written language, which only the help of another person can solve. Many industries are using Sensor due to their high level of performance and reliability and which is a great help for human beings. The obstacle avoidance Device is used for detecting obstacles and avoiding the is an autonomous Device Where we are using android device for the information for further Obstacle. The design of obstacle avoidance Program requires the integration of many sensors according to their task. The obstacle detection is primary requirement of this Ultrasonic Sensor and android system. The system gets the information from surrounding area through mounted sensors on the Android using the Bluetooth. Some sensing devices used for obstacle detection like bump sensor, infrared sensor, ultrasonic sensor etc. Ultrasonic sensor is most suitable for obstacle detection and it is of low cost and has high ranging capability.

II. LITERATURE SURVEY

[1] The paper represents the architecture and implementation of a system that will help to navigate the visually impaired people. The system designed uses GPS and voice recognition along with obstacle avoidance for the purpose of guiding visually impaired. The visually impaired person issues the command and receives the direction response using audio signals. The latitude and longitude values are received continuously from the GPS receiver. The Directions are given to the user with the help of audio signals. An obstacle detect or is used to Help the user to avoid obstacles by sending an audio message. GPS receivers use NMEA Standard. With the advancement in voice recognition it becomes easier to issue commands regarding directions to the visually impaired.

[2] In this paper we have presented the design of the voice based navigation system for blind using voice recognition module and GPS module implemented on arduino board. This system helps the blind person to navigate. The blind person will give the destination's name as the input to voice recognition module. GPS module continuously receives the latitude and longitude of the current location. GPS compares it with the destination's latitude and longitude. The blind person receives the pronounced directions which he needs to follow to reach his destination.

[3] The navigation system aims at building the application which provides guidance for
campus navigation and obstacle detection as well for blind people. The main purpose of this project is to guide blind people to reach from source to destination with shortest path. Our application is based on the concept of GPS which helps in navigating the path step by step through voice command. Along with this we are using ultrasonic sensor for obstacle detection. This system gets the information from surrounding area through mounted sensor on the Android using the Bluetooth.

[4] Today human machine interaction has become more common in our daily life. We Can try to make user interaction process friendly in our day today life. There are few Technologies which help to design and develop particular system. The primary goal of this Innovative project is to permit specially abled persons to explore autonomously in the outside world. Ordinary path navigation systems in the outdoor environment are costly an dits manufacturing is time consuming. The developed system is based on Arduino micro controller and sensing the surrounding environment via ultrasonic sensor. It is economically cost effective and easily implemented. This makes the product easily affordable and it will serve these specially abled people of the society.

III. PROPOSED SYSTEM
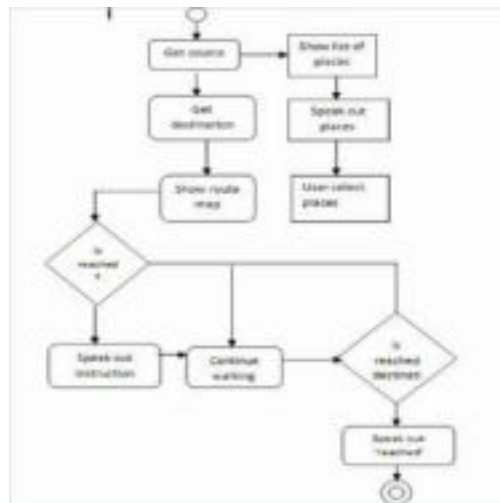
Flow Chart For Navigation

Problem Statement
In this project, we are using GPS rather than GIS. First of all, users have to speak out the places from the given list to get source and destination. Proposed system will identify location and navigate you to the nearest place or route. Get turn by turn direction to the destination. This system will provide location and time information in all weather and anywhere. If we enter into wrong route then automatic wrong route indication will be given by voice. The obstacle detecting device is used for sensing the obstacle and thus giving the notification through voice commands

Advantages of Proposed System
1) Space-based satellite navigation system.
2) Provides location and time information in all weather, anywhere on or near the Earth 3) If we enter into wrong root then automatic wrong root indication will give by voice. 4) If we are at near then automatic nearest place indication will give by voice.

Working Principle
The obstacle avoidance uses ultrasonic sensors for its movements and android device and Bluetooth for notification. A microcontroller of 8051 family is used to achieve the desired operations. The motors are connected through motor driver IC to microcontroller. The ultrasonic sensor is attached to the stick. Whenever the device is going on the desired path the ultrasonic sensor transmits the ultrasonic waves continuously from its sensor head. Whenever an obstacle comes ahead of it the ultrasonic waves are reflected back from an object and that information is passed to the microcontroller. The microcontroller controls the motors legt, right, back and front based on ultrasonic signals. In order to control the speed of each motor pulse width modulation is used (PWM).
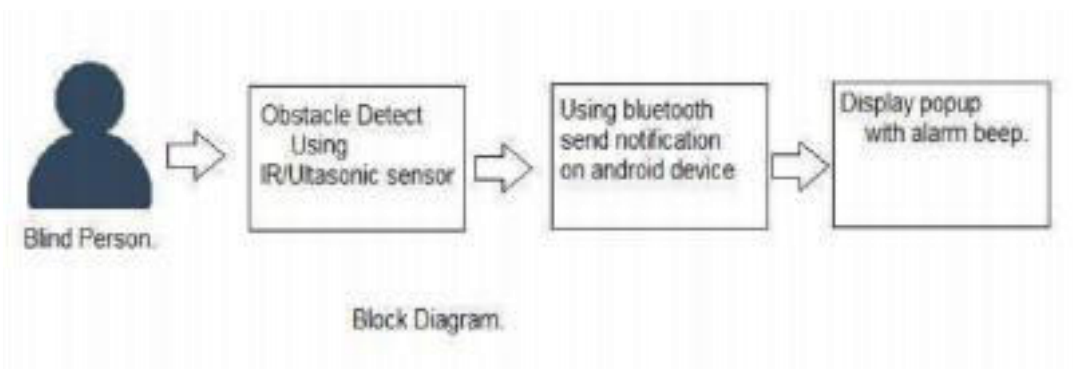
Fig. 1. Block diagram for the System Different Sensors used for obstacle avoidance Robotic vehicle

• Obstacle detection (IR sensor): The IR sensors are used for obstacle detection .The sensor output signal send to the microcontroller. The microcontroller controls the vehicle (forward/back/stop) by using the DC motor which is placed in vehicle. If any obstacle placed in line the IR sensor fails to receive the light rays and gives signals to the microcontroller. The microcontroller will stop the vehicle immediately and siren will on. After one minute the robot will be check the path status, if obstacle is removed the robot move far word else the robot will return back to move starting place. The sensor detects objects by emitting a short ultrasonic burst

and then listening for the eco. Under control of a host microcontroller, the sensor emits a short 40 KHz explosion. This explosion ventures or travels through the air, hits an article and after that bounces once again to the sensor. The sensor provides an output pulse to the host that will terminate when the echo is detected; hence the width of one pulse to the next is taken into calculation by a program to provide result in distance of the object.

• Ultrasonic Sensor: The ultrasonic sensor is used for obstacle detection. Ultrasonic sensor transmits the ultrasonic waves from its sensor head and again receives the ultrasonic waves reflected from an object. There are many applications use ultrasonic sensors like instruction alarm systems, automatic door openers etc. The ultrasonic sensor is very compact and has a very high performance. Where Bluetooth device give us the information about the obstacle and the android device get the message about the obstacle

• Working Principle: The ultrasonic sensor emits the short and high frequency signal. These propagate in the air at the velocity of sound. If they hit any object, then they reflect back echo signal to the sensor. The ultrasonic sensor consists of a multi vibrator, fixed to the base. The multi vibrator is combination of a resonator and vibrator. The resonator delivers ultrasonic wave generated by the vibration. The ultrasonic sensor actually consists of two parts; the emitter which produces a 40 kHz sound wave and detector detects 40 kHz sound wave and sends electrical signal back to the microcontroller.

Applications of Ultrasonic Sensor
• Intruder alarm system
• Back sonar of automobiles

Features of Ultrasonic Sensor
• Compact and light weight
• High sensitivity and high pressure
• High reliability
• Power consumption of 20mA
• Pulse in/out communication
• Narrow acceptance angle
• Provides exact, non-contact separation estimations within 2cm to 3m
• The explosion point LED shows estimations in advancement
• 3-pin header makes it simple to connect utilizing a server development link

Applications of Obstacle Avoidance
• Especially for blind person.

V. CONCLUSION AND FUTURE SCOPE

In this project, we have implemented an android app which is an innovative and cost effective guide system for blind people using an android phone. Also implemented the hardware which helps the blind to avoid the obstacle in their path by giving sound alert. This app will remove the dependency of blind people over others.

Our navigation application is socially very useful, because it gives the safe and easy use to the impaired people. The user can get vocal Prompts to avoid possible obstacles and step by step walking guidance. The technology used in smart phones is relatively used and makes great steps forward everywhere. A long term perspective, based on more accurate location sensors could offer user better interaction with their environment in the augmented reality view. Whereas in the current version of the prototype users just post comments based on their position, in later releases with an accurate method to determine the orientation of the device indoor, users could post comments directly to walls or other real life objects. Another huge benefit for the application would be to refine the network database for the campus of university.

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