An Automated Guide Map Application for Blind People Using Android Device

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Abstract—**The objective of this paper 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. While crossing a road the visually impaired person can easily identify the vehicles by using sensor. By clicking an icon the user get the current location. In this paper the authors describe a new system based on Android technology and designed for trying to solve this situation of impossibility of information that afflicts blind people.**

Keywords- Android, GPS, Text to Speech, RF, GIS.

1. INTRODUCTION

Blindness are visual impairment is a condition that affects many persons around the world. This condition leads to the loss of the precious sense of vision to such a degree that makes the concerned person handicapped due to the need for guidance or assistance and in some cases special treatment. Guidance by other humans, with good vision, or specially trained dogs is an obvious solution to help blind persons navigate their way around both in the house as well as outside the house. However, dependence on other humans is highly demanding and constraining in many ways. Trained dogs are very helpful however they have limitations that include inability to interpret what the blind persons really wants and identifying the objects. This is in addition to the continuous care cost for the dog.

Some technological solutions have been introduced recently to help blind persons to navigate independently. Many of those solutions rely on Global Positioning System (GPS) technology to identify the position and orientation of the blind person. While such systems are suitable for outdoor navigation, due to the need for line of sight access to satellites, they still need addition components to improve on the resolution and proximity detection to prevent collision of the blind persons with other objects and hence subject his/her life to danger.

The use of robot-dog is another technological solution proposed by a number of researchers. The robot-dog is an attempt to replace the real dog. It also depends on GPS and incorporates objects avoidances technologies. These solutions are useful, however they can only be used outdoor and miss interpretation of the blind person requests as well as accuracy issues may have serious consequences on the well being of the user.

The navigation system uses TTS (Text-to-Speech) for blindness in order to provide a navigation service through voice. Also, it uses Google Map API to apply map information [1].

The blind gives the input about the place he has to reach using microphones and the voice recognition system recognizes it .The input is then analyzed by the microcontroller which generates the bus numbers corresponding to the location provided by the blind [2].

The Electronic Path Guidance will help them to move in an unfamiliar place independently and with the same simplicity as they are in familiar surroundings. For this we are using the RF (Radio Frequency) communication [3]. When the blind person wears this ultrasonic waist-belt at stomach or at head, which consist of an ultrasonic distance sensor, Ultrasonic distance sensor, which is capable of detecting obstacles in its path of a blind person, senses the obstacles. This information is passed to the microcontroller which then alerts the user through voice circuit in case of any obstacles in that particular direction, which helps the user to avoid obstacles in its way. The controlling device of the whole system is a Microcontroller [4].

The currently widespread solution, also known as an accessible pedestrian signal (APS), uses a special sound/speech output to notify blind people about the status of a pedestrian signal at an intersection. However, this solution requires installation of expensive equipment at the intersections, limiting its applicability [5].

This paper presents a system that will enable blind or visually impaired person to navigate independently in the outdoors. The system integrates wireless communication technologies, path planning, sensors and other technologies to build a compact portable navigation system.

2. EXISTING SYSTEM

Finding an ROUTE or branch near to us is possible through GIS. A geographic information system is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographically referenced

data. The locator to find the services you require - simply enter your postcode, town or city and click on 'Search' to see all ROUTEs in your area. GIS is the merging of cartography, statistical analysis, and database technology. In a general sense, the term describes any information system that integrates, stores, edits, analyzes, shares, and displays geographic information for informing decision making.

GIS a more complex mapping technology that is connected to a particular database. Because it's generic, it is a broader term than the GPS in its technical sense. Thus, GIS is a computer program or application that is utilized to view and handle data about geographic locations and spatial correlations among others. It simply gives the user a framework to obtain information.

Fig. 1 Image of GIS

Identifies location & navigates you to the nearest Place or ROUTE. Get turn-by-turn directions to the nearest Place or ROUTE. The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather.
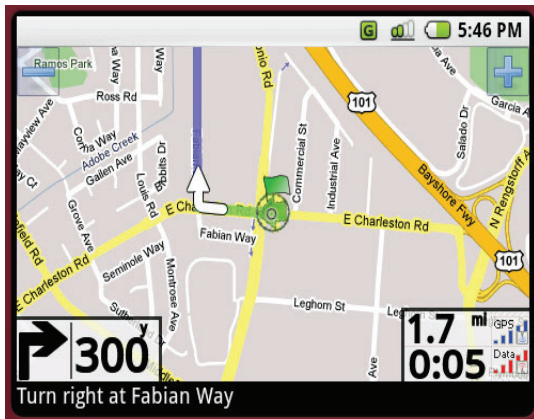

Fig. 2 Image of GPS

2.1 DISADVANTAGES
- Merging of cartography, statistical analysis, and database technology.
- Complex mapping technology.
- GIS is a computer program or application.
- No wrong root indication.
- No nearest indication.
- While using GPS, it doesn't identify the current location through voice.

3. PROPOSED SYSTEM
Identifies location & navigates you to the nearest Place or ROUTE. Get turn-by-turn directions to the nearest Place or ROUTE. The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather, anywhere on or near the Earth, where there is an unobstructed line of sight to four or more GPS satellites. It is maintained by the United States government and is freely accessible by anyone with a GPS receiver.

The GPS (Global Position System) is a network that locates certain places here on earth whereas the GIS (Geographic Information System) is a computer program that process data linked to certain places or locations.

3.1 ADVANTAGES OF PROPOSED SYSTEM
- Space-based satellite navigation system.
- Provides location and time information in all weather, anywhere on or near the Earth.
- If we enter into wrong root then automatic wrong root indication will give by voice. If we are at near then automatic nearest place indication will give by voice.
- To identify the current location using GPS connection in the way of voice guided system.

3.2 SYSTEM ARCHITECTURE
This system includes four modules which are used for the propose of navigation of blind without the help of other persons.
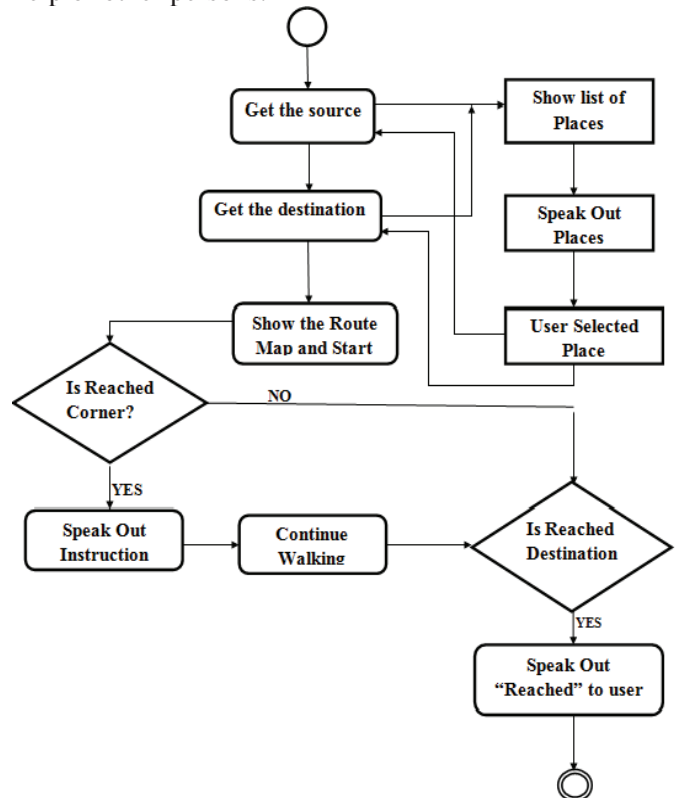

Fig. 3 Process Flow

The system gets the sources as input from the user as command then it gets the second input which is the destination. Then the route map of given source and destination will be displayed. When the person starts walking the direction of walking will b given in the form of command (spoken out). For finding the route map the route tracker map is used. Then for the speaking command the command guided system is used.

From the given source and destination the map is obtained by the use of GPS. The person starts walking from his/her source to the destination. Then each and everyone turn is indicate as the spoken command. Even the wrong way indication is made by the use GPS. This GPS provides the location and time information in all weather, anywhere on Earth.

4. CONCLUSION

This paper presented the architecture and implementation of a system that assists a blind person to navigate in the outdoor. The system can be considered as a semi-autonomous device. It provides full autonomy for global navigation, but relies on the skills of user for the navigation.

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