# A Review on a Visually Impaired Person : Challenging in Future

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## ABSTRACT

Today in the whole world due to cause of different diseases, many more people are at risk related to visually impairment. To assist a visually impaired person during navigation, from last decades varieties of devices are used like Guide dogs, white canes, sighted guide etc. and designed to help the individual in their travel. But with the advances in technologies it is more often possible to give support to people with unsighted. So in this paper we gave review on different navigation techniques. So due to this, the visually challenged individual can easily navigate independently.

**Keywords:** Visually Impaired, GPS, ETA, RFID, GSM and ZigBee.

## I.  INTRODUCTION

Navigation for a person with visually impaired or blind is more often in a world one of the challenging factor. From last few decades, it is observed that today by survey India is the one of the largest one number of Blind people in the world. Due to this the visually impaired person not navigates from one location to another easily as to avoid obstacles is not possible. There are lots of systems developed for easy navigation through a number of devices like Guide dogs, white canes, Braille interface and much more. Generally Guide dogs & white canes are used to assist and avoid obstacles for visual impaired peoples. But as per used and discussion it is clear that due to their limitations there is a requirement of development of new system for easy navigation.

Moreover, the sighted guide can be effective and comfort one but it has limitation of independence of blind people. More often Guide dogs, walking canes allow independence in travelling but it restricts in unfamiliar environments. Also for indoor communication, RFID is efficient and cost effective which provides one way communication, for short range only.

To help the visually impaired person, the Guide cane is mostly similar to white cane. With guide cane user move safely and quickly anywhere with any of difficulties or obstacles occurred. Like as white cane, user holds when he is walking. As compared to white cane, it is heavier as it uses servo motor and to detect obstacles it used ten ultrasonic sensors. The below figure 1 shows blind person [11],



**Figure 1:** Blind People

Researches has devoted their time to develop most of the advance technologies related to this problem like System for Wearable Audio Navigation, Secure and Safe Mobility Network, Smart Vision system, Outdoor Pedestrian mobility, WSN with ZigBee and GSM-GPS based system to overcome number of challenges. In below table 1 the review of various technologies used

with number of its disadvantages and devices used is given.

## II. METHODS AND MATERIAL

**TABLE I. DIFFERENT CATEGORIES OF TECHNOLOGIES USED**

| Sr. No. | System developed | Devices used | Disadvantages |
|---|---|---|---|
| 1 | **SWAN** (System for Wearable Audio Navigation) | a laptop, a tracking chip, GPS sensors, 4 cameras and headphones | It requires more (4) number of sensors so it is complex and expensive. |
| 2 | **SESAMONET** (Secure and Safe Mobility Network) | RFID micro chips, smart phone | It requires more number of RFID microchips so it is expensive. |
| 3 | Outdoor Pedestrian mobility | a cane or walking stick and guide dog | Difficult and dangerous. |
| 4 | Smart Vision system | Camera, RFID, GPS, LPC2148, Voice circuit | Difficult |
| 5 | WSN with ZigBee | Speech Recognition System, Voice Synthesizer, GPS, ZigBee | Not Cost effective |
| 6 | GSM-GPS based system | RFID, GPS, GSM, sonar senor | GPS cannot be used efficiently in indoor |

### A. Literature Review

This section comprises various research paper overviews related to visually impaired person with categories of different system with its drawbacks and also number of devices used.

| Sr. No | Year | Name of Paper | Abstract |
|---|---|---|---|
| 1 | 2012 | Voice operated outdoor navigation System for Visually impaired persons | In this paper main focused on the development and evaluation of a system for easy navigation of blind person with the use of GPS, voice and to detect obstacle used of ultrasonic detection as compared to already existing devices like Guide dogs, white canes etc. |
| 2 | DEC 2013 | Arm7 Based Electronic Travel Aid System for Blind People Navigation and Monitoring | This paper gave overview of ETA, to help the impaired person. The ETA is Electronic Travelling Aid which is fixed to stick of visually impaired person and when object is detected then it gave alerts through speakers. GSM & GPS are used to find the location of blind people. |
| 3 | AUG 2013 | Design and development of Secure Navigation system for Visually Impaired People | The proposed system in this guide to in sighted person to find a suitable path with the help of infrared detecting system and sends signal back through sound to user regarding his position. A sensor module is allowed the user to obtain the information regarding obstacles and also gave path which the user wants to go. This system provides the blind people easily navigate into environment. |
| 4 | FEB-2014 | Talking Assistance about Location Finding both Indoor and Outdoor for Blind People | This paper told about how to help the visually impaired person when he is travelling independently. Therefore the GPS is used for identification of location and provide voice alert when any obstacles occur. For this system, RFID is installed in public place with emergency button which is integrated with blind person also. |
| 5 | 2015 | Ultrasonic Navigation System for the visually impaired & blind pedestrians | To secure and help the blind people from an obstacle for easy navigation, an Ultrasonic Navigation system is proposed with by giving notification through audio. The implementation of this system shows that it guides the visually impaired person is secure, reliable and also cost effective one. |

| 6 | APR 2015 | RF-BASED TALKING SIGNAGE FOR BLIND NAVIGATION | In this paper, for a visually challenged people using android devices "Talking signage" is implemented. This system used mobile phone with Android application which gave intimation through voice message about the surrounding which is employ for any environment through the use of RF. The proposed architecture gave best practices as compared to other systems. |
|---|---|---|---|

### B. Devices used in System

With the advancement in market, the different technologies are used for easy navigation to blind individual. So in this section we are given outline of various devises are used as primarily with their features, advantages and also limitations. The numbers of devices are used as like Human guide, Guidance of dog, Navbelt and White cane etc. [11]

**A. White cane:** It is mostly preferred and popular hand held device, which is easily folded; adjust with the height of user. A person with blindness used moments like swing then scans the path about 1m distance approximately. It requires special training about 100 hrs app.
Advantages**:** Light weighted, cheapest one and Informs about shorelines.
Disadvantages: Not protect from obstacles.

**B. Guidance of dog:** To avoid obstacle avoidance, a trained dog assisting the blind, but usually it not aiding to find a way. It used rarely as 1%.
Advantages: Good for finding familiar path, to avoid obstacles.
Disadvantages: Costly and rarely used

**C. Human guide:** A blind individual walks with a sighted guide by hand in hand.
Advantages: Obvious one but not a permanent solution.
Disadvantages: A blind person lacks privacy & has a feeling of being a burden.

**D. Navbelt:** The Navbelt consists of an array of ultrasonic sensors with a belt, a portable computer, and is mounted on the front of the belt. The people wear a "fanny pack" on the abdomen and a portable computer as a backpack. Eight ultrasonic Sensors, each covering a sector of 15°, are mounted on the front pack, providing a total scan of 120°.
Advantages: Detect object & Detection range: 3m.
Disadvantages: Does not allow fast motion.

### III. CONCLUSION

In this paper we review on various research paper with the number of devices used in different system as we overview in first table. Also we can conclude that in future for helping purpose there is requirement of device with full of support to blind person and so blind people navigate easily.

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