

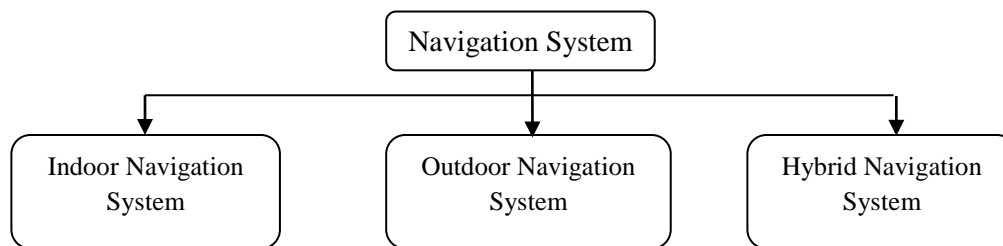
**ABSTRACT**

For finding the way Blind People or Visually Impaired Person (VIP) mostly use white canes or Guide dogs for obstacle detection and avoidance, but these two traditional systems have some limitation. Hence it is need to implementation of the system that helps the visually impaired person or blind person to navigate automatically. Navigation systems may be designed indoor or outdoor environment or it may contains both types i.e. hybrid. Different researchers use the different techniques to develop such type system. This paper provides the design and implantation of existing system.

**KEYWORDS:** Canes, Visually Impaired Person (VIP), Navigation System.

**INTRODUCTION**

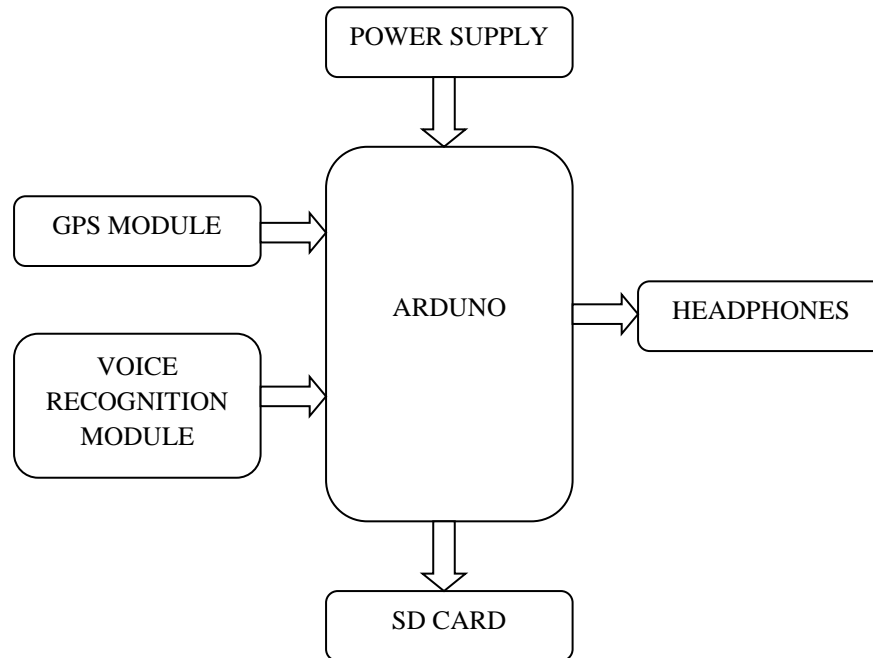
Mobility of visually impaired people is restricted by their incapability to recognize their surroundings. Mobility is nothing but the possibility of moving without support of any supplementary person. Hence it necessary to developed the system which helps the blind Person or Visually Impaired Person (VIP). This type of system has some criteria or Scenario, shown in figure 1.



*Figure 1 Types of Navigation System.*

Generally Navigation system is either an indoor or outdoor positioning system or Hybrid type. Indoor navigation systems are very critical than the outdoor navigation system. In the outdoor navigation systems mostly GPS is used for positioning of the blind person, whereas in the indoor navigation system, GPS signals cannot be received inside the building, lift, home etc i.e. indoors. Hence most of the developers used Global Positioning System (GPS) for outdoor navigation system, but in the indoor navigation system different techniques are used by the developers like using IR sensor, Ultra sonic sensor, and magnetic compass on handheld device etc. [4]. In some recent years some developer develops the hybrid systems, which are useful in the both scenario i.e. indoor navigation system and outdoor navigation system. This hybrid system overcomes disadvantages of both systems.

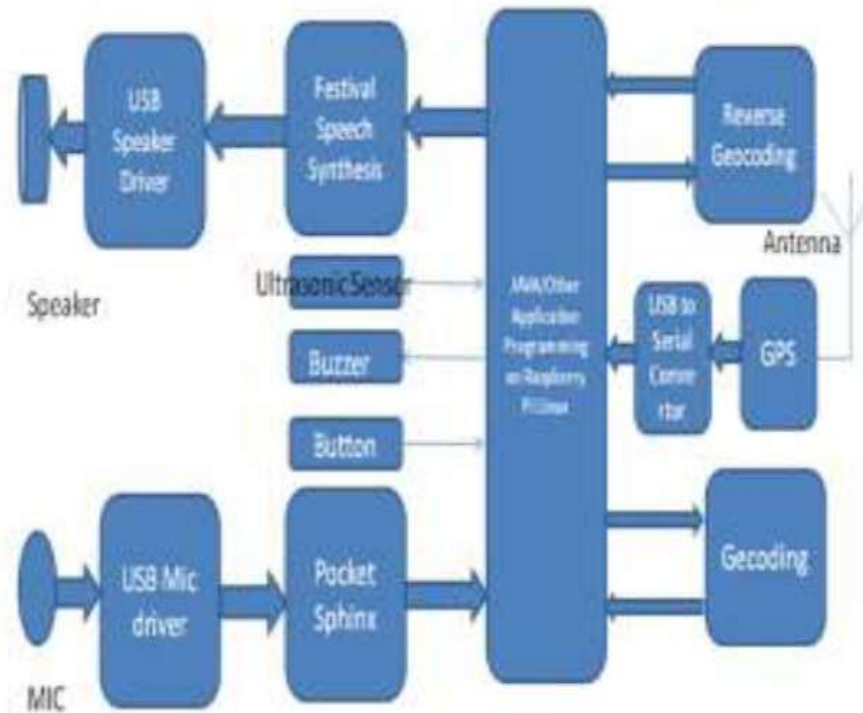
Manisha Bansode et al. [1] developed voice based navigation system for blind using voice recognition module and GPS module implemented on Arduino board. In this system, blind person will give the destination's name as the input to voice recognition module. GPS module continuously receives the latitude and longitude of the current location and compare with the destination's latitude and longitude. Figure 2 shows block diagram of the system.



*Figure 2 Block diagram of system [1].*

System consists of GPS receiver/ module (used Ublox NEO6MV2 GPS Module. It is a satellite-based navigation system made up of a network of 24 satellites placed into orbit.), Arduino (is an open-source computer hardware and software company, project and user community. It contains ATmega328 microcontroller, 14 Digital I/O Pins (6 PWM outputs), Analog Inputs, 32k Flash Memory, 16 MHz Clock Speed), Voice recognition module V3 (it provides destination's name as the input to the system), Headset, SD card reader (navigation directions are stored in audio format in the SD Card), SD card and other supplementary components. Main objective of this system is to help the blind people to get navigation directions through audio message which depends on the real-time assistance pro-vide by the GPS (Global Positioning System). In this system blind person gives the destination's name as the input to the voice recognition module and GPS continuously receives the latitude and longitude of the current location and compare with the latitude and longitude of the destination location continuously. The code uploaded in the Arduino the GPS gives the navigation directions to the blind person.

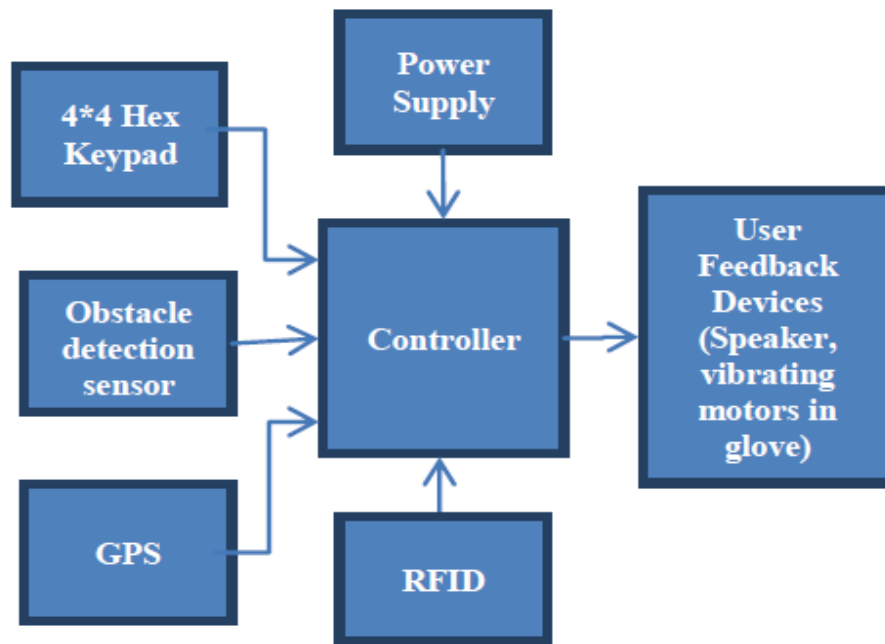
Anushree Harsur and Chitra.M [2] developed voice based navigation system for blind people using ultrasonic sensor, which permit blind persons to explore autonomously in the outside environment. Figure 3 shows the block diagram of the project which mainly includes different 6 module such as Initialization, User Interface, Address query translate, Route Query, Route transversal, and Obstacle detection. Initialization is the first module in which initialization of the system library is done. In the second module i.e. User Interface, in this step obtaining the destination address from user using a microphone. Here, the voice interface implemented uses services such as Text To Speech for the voice outputs and the Google Voice Recognizer API. In the third module, i.e. Address query translate, which translates geographic to coordinate this includes latitude and longitude.



*Figure 3 Block diagram of proposed method [2].*

In the fourth module i.e. Route Query, in which query is taken from the blind user i.e. destination, current Co-ordinate from GPS and the destination Co- ordinate, and compute the routes, also constantly monitor the position of a user using GPS module. In the fifth module i.e. Route transversal, which provides audible instructions to user in the form of speech so that the blind person can travel independently. In this module the GEO-CODER module was used to geo-code the destination address and then passed to text to speech synthesizer to generate a pedestrian route. Sixth module is Object detection, this module is used for obstacle detection and ultrasonic sensor has been used in this module.

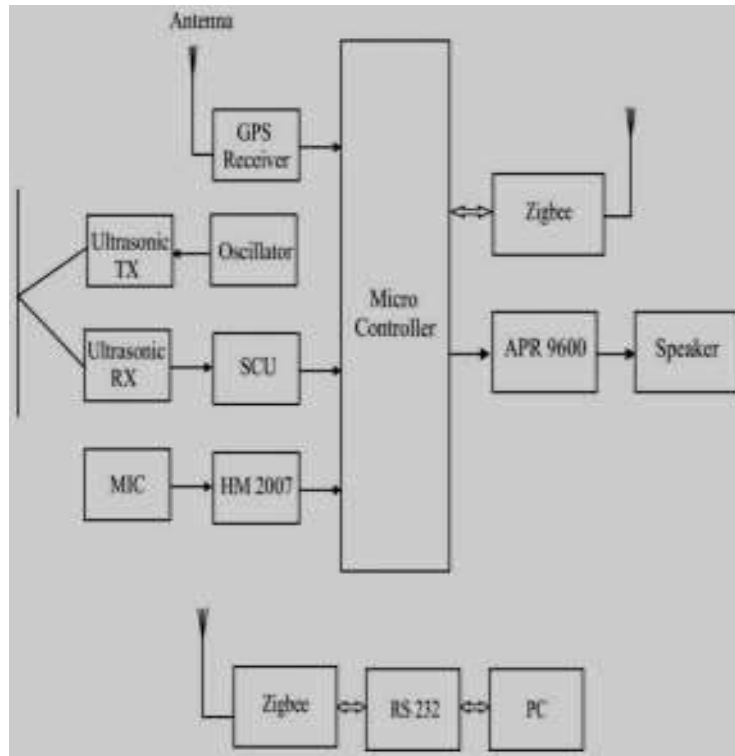
Rupa N. Digole and Prof. S. M. Kulkarni [3] developed a smart navigation system for visually impaired person and also this system provides indoor navigation by using Radio Frequency Identifier (RFID), outdoor navigation by using Global Position System (GPS) as well as obstacle detection by using ultrasonic sensor. In this system user provides starting and ending location. System will give voice instruction according to the destination and the starting position and also gives instruction of the obstacle in the path. Figure 4 gives the block diagram of proposed system.



*Figure 4 block diagram of proposed system [3].*

This proposed system consist of three modules, first module was 4\*4 Keypad for Visually Impaired Person (VIP) from which he/she will give the source and destination name. In the second module GPS Receiver, which will receives coordinates of source and destination and provides the route and also it will be saved as required by user. Third module uses Ultrasonic sensor, it was very important module because it will be used for detecting obstacle between the source and the destination route. In this proposed system controller is ARM7 (LPC2148) and Speaker will be used as a output feedback for user. EM18 RFID (Radio Frequency Identifier) is used for indoor navigation purpose, which is helpful in the building i.e. indoor navigation. In this system HCSR04 Ultrasonic Sensor was used, which provides 2cm to 400cm non-contact measurement function and the ranging accuracy will be reach to 3mm.

Dr. Boyina.S.Rao et al. [4] developed indoor navigation system for visually impaired person using GPS and navigate autonomously in the indoor environment. This system the Global Positioning System (GPS) and it also uses a Zigbee protocol for continuous tracking of the visually impaired person (VIP). Figure 5 shows the general block diagram of system. This system consists of eight main parts: Micro controller (ATMEGA 164PV is used in this system), GPS receiver (iTRAX02 is used in this project), Zigbee transceiver, Ultrasonic sensor, HM 2007 (it is a single chip CMOS voice recognition LSI circuit with the on chip analog front end), APR 9600 (it is sound record/reply IC incorporating flash analogue storage technique), Keypad and LCD display.



*Figure 5 General block diagram (Tx and Rx section) [5].*

In this proposed system, the blind person issues the command and receives the direction response using audio signals. GPS (Global Positioning system) receiver is used for continuously receives the latitude and longitude of blind people as well as destination. User train HM 2007, which is programmed in the sense that to recognize the word. The APR 9600 used for the voice navigation by using the two switches of playback and record.

## CONCLUSION

This paper provides overview on the GPS Navigation system for blind people or Visually Impaired Person (VIP)

## REFERENCES

- [1] Manisha Bansode, Shivani Jadhav, and Anjali Kashyap, "Voice Recognition and Voice Navigation for Blind using GPS", International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering, Vol. 3, Issue 4, April 2015, pp.91-94.
- [2] Anushree Harsur and Chitra.M, "Voice Based Navigation System for Blind People Using Ultrasonic Sensor", International Journal on Recent and Innovation Trends in Computing and Communication, Volume: 3 Issue: 6, pp. 4117 – 4122.
- [3] Rupa N. Digole and Prof. S. M. Kulkarni, "Smart Navigation System for Visually Impaired Person", International Journal of Advanced Research in Computer and Communication Engineering, Vol. 4, Issue 7, July 2015, pp.53-57.
- [4] Chaitali K. Lakde and Dr. Prakash S. Prasad, "Review Paper on Navigation System for Visually Impaired People", International Journal of Advanced Research in Computer and Communication Engineering, Vol. 4, Issue 1, January 2015, pp. 166-168.
- [5] Dr. Boyina.S.Rao, Ms. K.Deepa, Hari Prasanth.L, Vivek.S, Nanda Kumar.S, Rajendhiran.A, and Saravana.J, "Indoor Navigation System For Visually Impaired Person Using GPS", International Journal of Advanced Engineering Technology, Vol.3, Issue 2, April-June 2012, pp. 40-43.